IBM Maximo for Aviation
Version 7 Release 6

Guide

IBM

> **Note**
>
> Before using this information and the product it supports, read the information in "Notices" on page 259.

This edition applies to version 7, release 6, modification 3 of IBM Maximo for Aviation and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

Chapter 1. IBM Maximo for Aviation product overview

With Maximo® for Aviation, aviation companies can efficiently schedule and manage aircraft maintenance to maintain regulatory compliance and minimize periods when an aircraft is grounded.

The efficient maintenance, repair, and overhaul (MRO) of aircraft increases flight availability and extends the life of airframes, engines, and other components of an aircraft. Airlines can manage MRO services internally, purchase some or all of these services from MRO providers, and offer MRO services to other airlines.

Plan and organize maintenance

Maintenance planning involves monitoring the condition of aircraft or equipment and scheduling work at suitable repair locations where the necessary tools, materials, and labor skills are available.

Task cards and master task cards specify regular maintenance work that is required for aircraft or equipment, including frequency intervals when work becomes due that are based on meter readings, calendar dates, or both.

You associate task cards with job cards, work orders, and work packages that provide a detailed description of the work that is required. Work packages group related work orders and task cards.

Configure MRO locations to define the physical location, classification, and capabilities and to associate work packages with the location. Perform capacity planning to schedule aircraft or equipment to MRO locations for the full estimated duration of required work, for months or years in advance. Graphically assign work orders to labor within a hangar for a period of time, such as 2 weeks.

Manage regulatory compliance

Configure maintenance steering group (MSG-3) inspection programs and progressive inspection programs. Build a maintenance task library for use with maintenance planning documents and operator maintenance programs. In technical records, you can record the maintenance actions taken in response to airworthiness directives.

Configure aircraft and equipment

Define engineering models for aircraft and aircraft subassemblies that have build positions that are associated with configuration-managed (CM) parts. Models can include mechanical, electrical, electronic, and software equipment.

When you create configuration-managed aircraft or equipment and aircraft or equipment assemblies, and associate them with CM parts, the configuration rules for the model apply to them. When an aircraft is operational, changes to the aircraft or equipment are validated against the rules that are defined in the engineering model. This validation is important for aircraft that contain field-loadable software equipment.

Manage customers and suppliers

Manage customer agreements, service delivery, customer billing, and supplier contracts. You can manage aircraft or equipment and services for external customers or manage aircraft or equipment and services within an enterprise and bill for those services internally.

Create and manage purchase requests, receive and inspect purchased goods, and manage the qualifications, certifications, and capabilities of vendors and repair locations.

Manage warranties for aircraft, equipment, and parts and create warranty claims.

Mobile work management

The product package includes the IBM® Maximo Anywhere Work Execution for Complex Assets app that supports mobile work management, including searching for aircraft or equipment to install, remove, or replace. You can install and deploy the IBM Maximo Anywhere Work Execution for Complex Assets app on IBM Maximo Anywhere, version 7.5.2.

What's new in Maximo for Aviation 7.6.3

Maximo for Aviation 7.6.3 delivers enhancements in aircraft management, Start Centers, and scheduling. This release also introduces new procurement processes and enhances and integrates existing processes.

What's new in procurement in Maximo for Aviation 7.6.3

Procurement is easier in version 7.6.3 because of enhancements to the Receiving and Inspection application, the addition of an application that is dedicated to shipments, and streamlined integration of all procurement processes.

Manage parts more easily in the Receiving and Inspection application

You can now receive non-lotted parts and view these parts as components of a kit. Therefore, you can check that the correct parts are included in the kit and that the correct quantity of each part was received. You can easily view the status, airworthiness tags, or related documents for each part. A part or piece of equipment can be returned immediately in the Receiving and Inspection application. The depreciation process is now more closely associated with the receiving and inspection process. In the Inventory application, you can view the receiving and inspection lines that are related to a storeroom or part number. Learn more about the enhancements to the Receiving and Inspection application.

Use the new Shipments application to create and track shipments in an integrated end-to-end shipment process

The shipment process is effectively integrated into the procurement process and the Exchange Orders application. This integration means that locations can be associated with vendors, and shipment requests can be generated from the Purchase Orders application or the Exchange Orders application. You can specify which transactions automatically generate shipments or shipment requests. To reduce transportation costs, in the Shipments application you can also consolidate

several shipment requests into a single shipment. Learn more about managing shipments.

Exchange an unserviceable part for a serviceable part by using the new customer exchange order process

The new exchange order process is effectively integrated with the existing receiving and inspection process so that an exchanged part can be easily accepted, rejected, or returned. You can now use a single receiving process to consistently manage any purchased, repaired, loaned, or exchanged part. Learn more about the new exchange order process.

Achieve more streamlined transactions because of the integration of procurement and work order tracking

You can now specify, on a work order plan, if a service such as a repair, loan, lease, or exchange is needed for a part or tool. Any request for service on a work order automatically creates any necessary purchase requisitions or purchase orders. Learn more about the integration of procurement and work orders.

Gain greater flexibility in invoicing loan or lease orders

When a loaned or leased part must be kept for longer than initially planned, the related invoice can be approved even though it has a greater duration than was specified on the purchase order. Learn more about loan and lease orders.

What's new in aircraft management in Maximo for Aviation 7.6.3

Version 7.6.3 includes enhancements that make managing aircraft easier and also provide greater flexibility when working with systems and models.

Use the new Aircraft Roles and Capabilities application to manage the operational readiness of aircraft

By using the new application, you can define aircraft roles and capabilities and specify the relationships between roles, capabilities, and systems. You can also easily identify the configuration status of an aircraft to determine whether it can satisfy specified roles and missions. Learn more about the new Aircraft Roles and Capabilities application.

Associate systems with models to standardize definitions and specify configuration rules for the systems

You can now define a master list of systems that can be applied to multiple models to standardize engineering definitions. To better understand system dependencies and relationships, you can now view functional representations of an aircraft or piece of equipment and its systems, and also see which systems are associated with a particular build position. These insights can help you to define system-specific configuration rules. Learn more about associating systems with models.

Filter and sort records on the Maintenance Plan tab of the Aircraft and Equipment applications

You can now find tasks more easily in the Aircraft and Equipment applications, because you can filter and sort on a wider selection of columns than previously possible.

What's new in Start Centers in Maximo for Aviation 7.6.3

New customized portlets on the Start Center give immediate access to the data that you want to see.

Quality managers, quality auditors, and quality controllers have new result set portlets to easily view the data that is most important to their roles. The new portlets are Labor with Expiring Qualifications, Receipts Waiting on Inspection, Unauthorized Purchase Orders, Companies with Expiring Certificates, and Ongoing Audits and Surveys. Warehouse managers have two new portlets in the start center. The Shipment Request KPI List provides visibility into the number of shipment requests that initiated from exchange, repair, loan, lease, or purchase orders. The Shipments bar chart provides a quick glance at the number of shipments that are being processed by status.

What's new in scheduling in Maximo for Aviation 7.6.3

IBM Maximo for Aviation version 7.6.3 introduces new features that streamline scheduling and improve navigation.

Updated graphical view technology

The Gantt view was updated to eliminate the use of Java applets.

Enhanced Graphical Scheduling application

The Asset/Location Graphical Scheduling application was merged with the existing Graphical Scheduler application. In the Graphical Scheduling application, you can create schedules that are based on asset, location, and work queries. Learn more about graphical scheduling.

For information about migrating your Graphical Scheduling data from earlier versions, see *Migrating your Graphical Scheduling data* (http://www-01.ibm.com/support/docview.wss?uid=swg21979396).

Enhanced Graphical Assignment applications

The Repair Facility Graphical Assignment application was merged with the existing Graphical Assignment application. In the Graphical Assignment application, you can assign work to labor and crew resources based on their work facility. Learn more about graphical assignments.

For information on migrating your Graphical Assignment data from earlier versions, see *Migrating your Graphical Assignment data* (http://www-01.ibm.com/support/docview.wss?uid=swg21985575).

Enhanced Graphical Assignment - Repair Facility application

The Repair Facility Capacity Planning application was renamed Graphical Assignment - Repair Facility. You use the Graphical Assignment - Repair Facility

application to manage location assignments. Learn more about location assignments.

Enhanced Graphical Crew Management application

In Graphical Crew Management, the data that was previously shown in the Graphical View tab has been divided into separate tabs - one for crew data and the other for assignment data. You use the Graphical Crew Management application to visualize and manage the labor and assets that are assigned to positions in crews. Learn more about graphical crew management.

Enhanced navigation

New features were added to the Gantt view. You can assign work to labor and crew resources based on their availability, which splits the work into shifts automatically. A multiple skills icon indicates when labor or crew resources possess multiple skills. Learn more about assigning work.

You can filter data in the work list of the Gantt view by using a new filter that is available in every column. Learn more about filtering data.

What's new in mobile applications in Maximo for Aviation 7.6.3

A new application makes mobile work management simple and efficient.

By using the IBM Maximo Anywhere Work Execution for Aviation application, you can add, remove, and replace aircraft or pieces of equipment. You can also select or search for work orders and browse the hierarchy until you find the aircraft or piece of equipment that you want to add, remove, or replace. You can also use the **Search Hierarchy View** to find aircraft or equipment records. You can search by record, description, part number, serial number, label, or position.

What's new in documentation in Maximo for Aviation 7.6.3

In this release, the documentation in IBM Knowledge Center is updated with topics that provide an overview of some of the more complex processes in Maximo for Aviation. Updated documentation includes new detailed scenarios for the procurement process and for work order tracking.

Detailed scenario for the procurement process

The procurement process can involve many different steps, some of which are complex. The process is clarified in the new scenario, which uses a realistic example to give a clear overview of the whole process. Learn more about the procurement scenario.

New topic describes the wide range of capabilities that are available in the Work Order Tracking application

The documentation contains a new topic that describes the functions that are available in the Work Order Tracking application and describes an end-to-end process for creating work orders to monitor maintenance progress. Learn more about the work order topic.

What's new in Maximo for Aviation 7.6.2.1

The 7.6.2.1 release of Maximo for Aviation focuses on improving the procurement process and includes changes to depreciation, receiving, and inspection, loan and lease orders, and qualifications.

Receiving and inspection process is now more efficient

Improvements in the receiving and inspection process mean that you can now select a default receiving storeroom, view related records, and easily manage airworthiness tags. Also, the depreciation process starts automatically when a purchased part is received and accepted. Learn more about the receiving and inspection process.

Loan and lease orders can be tracked effectively

By using the new loan and lease order process, you can manage loan orders in the Invoicing application and track lease and loan transactions in the Receiving and Inspection application. To improve efficiency, the completion of the lease receipt process automatically authorizes the approval of the service invoice that is received from the customer. Learn more about tracking loan and lease orders.

Qualifications are easier to manage

You can now add new requirements for qualifications, edit existing requirements, and associate requirements with labor. You can also view the qualification requirements that are completed, required, or in progress.Learn more about managing qualifications.

Applications are redesigned to make completing tasks easier

Sections of the Work Order Tracking application and the Job Card application are redesigned to reflect the logical flow of the tasks. These changes are designed to improve the usability of the applications.

What's new in Maximo for Aviation 7.6.2

The 7.6.2 release of Maximo for Aviation focuses on helping you achieve your goals in safety, regulatory compliance, billing, and procurement.

New in safety and regulatory compliance in Maximo for Aviation

Maximo for Aviation includes key enhancements to help you maintain safety and comply with regulations. These enhancements incorporate processes such as recording damage and tracking repairs, monitoring weight and balance measurements, and maintaining a sample maintenance program. You can also ensure that tasks are completed at the correct interval by laborers with the required up-to-date qualifications. This release also introduces new applications that give you the tools to maintain safety standards.

Record any structural damage on an aircraft and track the related repairs

On the new **Structural Damage and Repair** tab in the Aircraft application, you can create a record to specify damage to an aircraft such as dents, scratches, cracks, or

buckles. You update this record if the extent of the damage changes or when the damage is repaired. The new tab also includes a graphical representation of the aircraft so that you can accurately pinpoint the location of the damage. Learn more about structural damage and repair records.

Successfully identify and manage the aircraft that are part of a sampling program to comply with directives

You can import sample threshold and interval information into the MTL, Master Task Card, and Task Card applications so that you can create a sampling program in an OMP record. You can also identify the individual aircraft that are part of a sampling program to help you identify the impact on the frequency of maintenance tasks. Learn more about managing sampling programs.

Closely monitor the weight and balance of an aircraft in accordance with regulatory requirements

You can now specify whether an aircraft is subject to weight and balance requirements and also set the units of measurement and limitations for the aircraft. Engineers can identify maintenance activities that result in weight and balance changes, and the mechanics who do these activities can record the changes. Automatic checks are also included so that if the weight and balance variance percentage is reached, an alert is created for the aircraft. Learn more about monitoring weight and balance.

Increased efficiency in creating models and managing the associated part numbers

You can now define part number applicability by model for both rotable and consumable parts. Learn more about associating part numbers to models.

Manage safety more effectively with new applications

New applications are added that help you maintain safety standards. These new applications cover areas that include audits and surveys, regulatory compliance, defects, operating procedures, and action tracking. Learn more about the new safety applications.

Ensure that aircraft maintenance tasks are performed at the correct frequency to reduce aircraft ground time

When work orders are completed, the next due dates and due counts of task cards are automatically adjusted. This adjustment applies to task cards that are in a check loop and also individual task cards that are not part of a loop. You can also define check loops in an operator's maintenance program. Learn more about performing maintenance tasks at the correct frequency.

Track qualifications and renewals to ensure that only laborers who have the appropriate qualifications are assigned to tasks

Each aircraft requires laborers to have specific qualifications. You can now associate individuals with a qualification and view qualifications that are associated with a particular labor record. The renewal dates for each qualification type can also be tracked to keep all qualification types updated. Learn more about tracking qualifications and renewals.

Record flight data while on the move with the Electronic Flight Log Book application

By using the IBM Maximo Anywhere Electronic Flight Log Book application you can record flight data information and create associated records that are added to the flight log book. The application can be installed on mobile devices to ensure prompt entry of important operational information for each aircraft. Learn more about the Electronic Flight Log Book application.

New in procurement in Maximo for Aviation

Enhancements in Maximo for Aviation simplify and improve procurement processes. You can now check whether a vendor is approved for a procurement order and determine what is covered by a contract with a vendor. You can specify alternate parts on purchase contract lines and track shipments for purchase orders. You can also track the receipt of parts to improve inspection and quarantine processes.

Ensure that vendors are certified and approved for each transaction to help maintain safety standards

You can track supplier certifications and renewals to support regulatory requirements. You create and update approval rules to set the standards that vendors must meet. The vendor that you select for a procurement order must then pass an approval process that uses approval rules. Learn more about ensuring that vendors are appropriately certified and approved.

Avoid delays in part replacement by specifying alternate parts on purchase contract lines

You can now specify alternate parts on a purchase contract so that if a vendor or supplier cannot deliver an ordered part, the alternate part can replace it instead. This flexibility in part replacement ensures that the aircraft is repaired as soon as possible without any impact on safety. Learn more about specifying alternate parts on purchase contract lines.

Set a maximum amount on purchasing contracts to block any unauthorized payments

In the Purchase Contracts application, you can specify the maximum value that a PO can have on a price contract or purchase contract and specify whether this maximum PO value can be exceeded. By specifying a maximum amount on purchasing contracts, unauthorized purchases can be prevented. Learn more about setting a maximum amount of purchasing contracts.

Efficiently manage procurement orders to secure expenses and improve interactions with vendors

When you create procurement transactions, you can now check which fleet, which aircraft, which equipment, and which parts are covered by the contract. You can avoid ordering a service on an aircraft that is not covered by the contract. Learn more about checking what is covered by a contract.

Track shipments for purchase orders

You can now manage and track the movement of parts as they are shipped from vendors, warehouses, storerooms, and repair locations. The **Shipments** tab in the Purchase Orders application contains all the shipping details for each part that is involved in a purchase order transaction. Learn more about managing shipment on external purchase orders.

Effectively track the receipt of rotable parts to improve inspection and quarantine processes

When parts are delivered or when rotable parts are repaired, you use the new Receiving and Inspection application to track their receipt. If an inspection reveals a nonconformity and a part must be quarantined, you can store the part in a quarantine location. The part is held in that location until it is assigned for use, returned to the vendor, or scrapped. Learn more about managing receipt, inspection, and quarantine processes.

New in customer billing in Maximo for Aviation

Maximo for Aviation 7.6.3 introduces new features, including labor-based price books, customer agreement templates, and improvements to customer billing.

Efficiently manage labor prices for multiple customers by using price books

You can create a price list for labor resources in a price book. This list of labor prices can be shared with multiple customers, and you can update the labor prices without revising the customer agreement. Learn more about price books.

New fields in the Work Order application provide better visibility into bill processing

New fields in the Work Order application and Service Request application identify the stage that a work order is at in the billing process. The new fields also show the amount that should be billed, the amount that was billed, and any outstanding amounts on a work order. Learn more about the billing process for work orders.

Make customer billing more efficient by adding multiple work orders, tickets, or sales orders to bill batches

You can add multiple work orders, tickets, or sales orders to a bill batch in the Customer Billing application. Learn more about copying work orders to bill batches.

Use templates to create customer agreements for new customers

You can define customer agreement templates in the Customer Agreements application to store values in fields that are common to multiple customers. You can apply these saved templates to one or more customers. Learn more about customer agreement templates.

Conveniently update customer references on bill batches

You can update customer purchase order numbers and cost centers on each work order, sales order, or ticket from a bill batch in the Customer Billing application.

This capability makes the billing process more efficient and reduces administrative burden. Learn more about estimating prices for work requests.

Greater flexibility when you manage bill dates

You can now change the next bill date on billing schedules and price schedules that are currently in progress. Learn more about billing and pricing schedules.

Set the status of bill lines on work orders to reduce review time

In the Work Order application, you can set the bill line status of work orders before they are added to the customer bill. You can approve, prebill, or hold a work order before the bill is created. This new functionality reduces the review time that is required by the service provider during the customer billing process. Learn more about bill line statuses.

New in scheduling in Maximo for Aviation 7.6.3

Scheduling is improved in Maximo for Aviation with the addition of the new Aircraft/Location Graphical Scheduling application.

Ensure that work is properly scheduled with the new Aircraft/Location Graphical Scheduling application

In the Aircraft/Location Graphical Scheduling application, you can create schedules that are based on aircraft, location, and work queries. In the Gantt view, you can see all the work in the schedule, and the resource requirements for that work. You can therefore reschedule work so that resources are not overloaded or underutilized, and you can compare various work schedules by creating different scenarios. The new application also helps you to identify possible scheduling conflicts that might arise from multiple concurrent work orders that need the same resources. Learn more about the new Aircraft/Location Graphical Scheduling application.

New in performance and environment in Maximo for Aviation

Improvements in performance include added support in the build data interpreter (BDI) service and new Cognos® reports.

New capabilities in Cognos reporting aid in performance measurement

A new report is available in this release that shows the fleet hours and fleet cycles of an aircraft by manufacturer and by month. This report can be viewed as a table or as a graphic. You can also view the fleet hours and fleet cycles for the entire fleet by month. This report is also available in a table or in graphical format. These reports help engineers evaluate repetitive defects, analyze and interpret trends, and compare operational reliability with industry and manufacturer standards.

Extension of validation by the build data interpreter service

The BDI service now supports validation for aircraft weight and balance reporting and revised support for minimum equipment lists. Support for a multitenancy environment is also added. Learn more about the BDI service.

Configure a multitenancy environment to reduce IT infrastructure costs

Selecting the multitenancy installation option creates a separation of the database to enable multiple independent tenant entities to co-exist in the same instance of the database. Individual tenants within a multitenancy environment can maintain their own data, configurations, workflow, and reports. The multitenancy option is intended for use, primarily, by hosting companies that want to reduce IT infrastructure costs. After you perform a multitenancy installation, you cannot revert to a non-multitenancy deployment. Learn more about configuring a multitenancy environment.

What's new in Maximo for Aviation 7.6.1

New features and capabilities in Maximo for Aviation can help your organization achieve greater efficiency in aviation management through improvements in planning, task completion, and validation.

Technical publications

By using the updated technical publications, you can optionally select to complete all task cards when technical publications are completed or before the method of compliance is reported.

Security groups

By using the new organizational security groups, you can manage user licenses. You can add users to a predefined security group to allow them to access the application features that they need, including role-based Start Centers.

Budget monitoring

In the new Budget Monitoring application, you can create budget records to monitor transactions in a financial period. Monitoring budget costs can help to ensure that projects or activities are completed within an agreed budget and can improve estimation of the costs of future projects.

Build data interpreter

A new build data interpreter (BDI) service, designed to improve validation performance, provides asynchronous validation of changes that affect engineering reference data.

Flight log book enhancements

New enhancements in the flight log book application incorporate more details on attributes for specific flights and improve failure reporting.

Multitenancy information for Maximo for Aviation

Multitenancy provides data isolation for each tenant that is hosted by a system provider. Customers can be administered as tenants, which means that each customer's data and customer-level business processes can be isolated from data and processes for other customers.

Multitenancy features are available when Maximo for Aviation version 7.6.3 or later with Multitenancy is installed.

Multitenancy documentation

If multitenancy features are available to you, you can learn how to configure and use those features from the following resources:

- The implementation and administration PDF guide and help plug-ins for system providers are installed with the product in a documentation .zip file. The documentation .zip file contains a readme file that describes how to deploy the help plug-in. These files are intended only for system providers. System providers must follow the instructions in the readme file to ensure that the system provider help files are not made available to tenants.
- The help plug-in for tenants that includes system provider tenant users is available online in Maximo Asset Management v7.6.0.5 Multitenancy information in IBM Knowledge Center.

Global administrator access to product applications

Typically, global administrators configure the product for all tenants. If global administrators need to work with applications that are specific to Maximo for Aviation, they must be granted access to those applications manually. The product enabler does not grant this access.

Accessibility features for Maximo for Aviation

Accessibility features for Maximo for Aviation assist users who have disabilities, such as restricted mobility or limited vision, to use information technology content successfully.

Accessibility features

Maximo for Aviation includes the following major accessibility features:

- Supports interfaces that are commonly used by screen readers.
- Can be operated by using only the keyboard.
- Provides documentation in an accessible format.
- Allows the user to access the interfaces without inducing seizures due to photo-sensitivity.

Maximo for Aviation uses IBM Installation Manager to install the product. You can read about the accessibility features for IBM Installation Manager at http://www.ibm.com/support/knowledgecenter/SSDV2W_1.8.4/ com.ibm.help.common.accessibility.doc/topics/ceaccess.html?lang=en

Maximo for Aviation uses the latest W3C Standard, WAI-ARIA 1.0 (http://www.w3.org/TR/wai-aria/), to ensure compliance with US Section 508 (http://www.access-board.gov/guidelines-and-standards/communications-and-it/ about-the-section-508-standards/section-508-standards) and Web Content Accessibility Guidelines (WCAG) 2.0 (http://www.w3.org/TR/WCAG20/). To take advantage of accessibility features, use the latest release of your screen reader in combination with the latest web browser that is supported by this product.

Maximo for Aviation contains a screen reader check box. The **Use Screen Reader** check box is in the User tab of the Users application. When you select the check box, the user interface is optimized to work with a screen reader. The Accessibility

Help window provides details on general navigation, menu navigation, and hot keys. Click **Accessibility Help** from the toolbar of the product to access the help window. To use the accessibility tools to read reports, you must access the reports in Microsoft Excel. In the reports applications, select the **Run Reports** option. With this option, you can email an `.xls` file version of a report to yourself at a scheduled time.

The Maximo for Aviation online product documentation in IBM Knowledge Center is enabled for accessibility. The accessibility features of IBM Knowledge Center are described at http://www.ibm.com/support/knowledgecenter/doc/ kc_help.html#accessibility.

Keyboard navigation

Maximo for Aviation uses the following keyboard shortcuts.

Table 1. Keyboard shortcuts for general navigation

Action	Keyboard shortcut
Move from one interface element to the next.	Tab key
Select buttons, links, and menu options.	Enter key
Select or clear a check box.	Spacebar
Display field help for the field that is in focus.	Alt+F1

Table 2. Keyboard shortcuts for global navigation

Link name	Keyboard shortcut
Bulletins	Alt+B
Go To	Alt+G
Reports	Alt+R
Start Center	Alt+C
Profile	Alt+P
Sign Out	Alt+S
Help	Alt+H
Return	Alt+R
Return with Value	Alt+W

Table 3. Keyboard shortcuts for application-specific actions

Action	Applications	Keyboard shortcut
Assign Labor	Assignment Manager	Ctrl + Alt + L
Finish Assignment	Assignment Manager	Ctrl + Alt + F
Interrupt Assignment	Assignment Manager	Ctrl + Alt + U
Select Work Date	Assignment Manager	Ctrl + Alt + W
Start Assignment	Assignment Manager	Ctrl + Alt + T
Start Timer	Activities, Changes, Incidents, Problems, Releases, and Service Requests	Ctrl + Alt + B

Table 3. Keyboard shortcuts for application-specific actions (continued)

Action	Applications	Keyboard shortcut
Stop Timer	Activities, Changes, Incidents, Problems, Releases, and Service Requests	Ctrl + Alt + E

Table 4. Keyboard shortcuts for toolbar actions

Action	Keyboard shortcut
Insert New Record	Ctrl+Alt+I
Save Record	Ctrl+Alt+S
Clear Changes	Ctrl+Alt+C
Previous Record	Ctrl+Alt+P
Next Record	Ctrl+Alt+N
Change Status	Ctrl+Alt+A
Create KPI	Ctrl+Alt+K
Put record in edit mode or release record from edit mode	Ctrl+Alt+L

Table 5. Keyboard shortcuts for tables

Action	Keyboard shortcuts
Next Row	Ctrl+down arrow
Previous Row	Ctrl+up arrow
Open/Close Table Window Filter	Ctrl+Z
Next Page	Ctrl+right arrow
Previous Page	Ctrl+left arrow

Table 6. Keyboard shortcuts for dates

Action	Keyboard shortcuts
Insert today's date	Ctrl+SHIFT+7
Move forward one day	ALT+up arrow
Move back one day	ALT+down arrow
Move forward one month	Ctrl+SHIFT+0
Move back one month	Ctrl+SHIFT+9
Move forward one year	Ctrl+SHIFT+up arrow
Move back one year	Ctrl+SHIFT+down arrow

Table 7. Non-standard keyboard shortcuts

UI element	Action	Standard UI response	Deviation
Radio buttons	To move between radio buttons, press the Right and Left arrows.	The radio buttons are selected as the user moves though them.	The radio buttons are highlighted but not selected as the user moves through them. A radio button is selected only when the user presses Spacebar or Enter on the highlighted radio button.
Tree view	To select a node, press Enter.	When the user presses Enter, the default action is performed for a node.	Nodes might have zero, one, or two actions.

If a node has 2 actions and a user navigates to an element by using the arrows, when the user presses Enter the default action is performed. When the user presses Enter a second time, the secondary action is performed. |

Interface information

Maximo for Aviation has the following accessibility characteristics:

- If PDF files are included, the files have limited accessibility support. With PDF documentation, you can use optional font enlargement, high-contrast display settings, and you can navigate by keyboard alone. All PDF documentation is also available in HTML format.
- Maximo for Aviation online product documentation is available in IBM Knowledge Center, which is viewable from a standard web browser.
- Maximo for Aviation does not have audio features in its interface.
- You can use supported screen readers with the user interface.
- You use the **Go To** menu to navigate to any of the applications that you have access to. The **Go To** menu is a cascading menu that is three levels deep at its deepest point. You can use the screen reader with the **Go To** menu. The following instructions apply to both the standard navigation and the side navigation menu and describe how to get started with the screen reader:
  1. To get to the **Go To** menu press Alt+G.
  2. When you open the menu, the screen reader reads the first application in the menu. If the screen reader does not read the entry, restart the screen reader.
  3. Navigate the list of applications in the menus by using the arrow keys.
  4. The screen reader indicates whether a menu item has submenus. To get to a submenu, press the right arrow or enter.

5. Press the left arrow to move up a level in the hierarchy. If you press the left arrow at the highest level of the **Go To** menu, you leave the menu completely.

6. Press the Enter key to enter an application.

- The Maximo for Aviation user interfaces do not have content that flashes 2 - 55 times per second.

The Maximo for Aviation web user interfaces rely on cascading style sheets to render content properly and to provide a usable experience. The application provides an equivalent way for low-vision users to use a user's system display settings, including high-contrast mode. You can control font size by using the device or web browser settings.

The Maximo for Aviation web user interface does not rely on cascading style sheets to render content properly and to provide a usable experience. However, the product documentation does rely on cascading style sheets. IBM Knowledge Center provides an equivalent way for low-vision users to use a user's system display settings, including high-contrast mode. You can control font size by using the device or browser settings.

The Maximo for Aviation web user interface includes WAI-ARIA navigational landmarks that you can use to quickly navigate to functional areas in the application.

Related accessibility information

In addition to standard IBM help desk and support websites, IBM has established a TTY telephone service for use by deaf or hard of hearing customers to access sales and support services:

TTY service 800-IBM-3383 (800-426-3383) (within North America)

IBM and accessibility

For more information about the commitment that IBM has to accessibility, see IBM Accessibility (www.ibm.com/able).

Chapter 2. Installing Maximo for Aviation

The installation of Maximo for Aviation involves running an installation program and a configuration program, both of which are started from the launchpad.

System requirements for IBM Maximo for Aviation

Before you install Maximo for Aviation, ensure that your environment meets the hardware and software requirements.

A complete list of hardware and software requirements is available in the System Requirements section of the Maximo Asset Management wiki.

The user who installs Maximo for Aviation and the mobile apps must have administrative user rights.

IBM Maximo for Aviation administrative workstation

When you install Maximo for Aviation, Maximo Asset Management 7.6.0.5 and the middleware components are also deployed.

The middleware components that are deployed are IBM DB2® and IBM WebSphere® Application Server Network Deployment. However, you can deselect the middleware components if your existing environment uses other supported products.

Restriction: You cannot update an existing installation of Maximo Asset Management 7.6 at the same time that you install IBM Maximo for Aviation 7.6.3.

If Maximo Asset Management 7.6 or 7.6.0.4 is already installed, use IBM Installation Manager to update to Maximo Asset Management 7.6.0.5 before you begin.

Mobile apps

Before you install the mobile apps, you must install IBM Maximo Anywhere 7.5.2 or a later version. Maximo Anywhere includes required components that must be installed on the Maximo for Aviation administrative workstation. The required components include OSLC object structures and licenses that enable a set of applications in Maximo Asset Management.

As part of the app installation, you must deploy another set of required components on the Maximo for Aviation administrative workstation.

Maximo Asset Management Multitenancy

Maximo for Aviation 7.6.3 can be installed with Maximo Asset Management Multitenancy 7.6.0.5, and Maximo for Aviation is enabled for all tenants except the system provider tenant.

Installing Maximo for Aviation

The Maximo for Aviation deployment includes Maximo Asset Management and the related middleware.

Before you begin

If you plan to perform a silent installation of the product later, see the information about installing silently.

Procedure

1. Download the Maximo for Aviation 7.6.3 product software for your operating system from IBM Passport Advantage® and extract the installation images to a local directory.

2. Start the launchpad by double-clicking the launchpad file. If your computer is a Windows system, use the launchpad64.exe file. If your computer is a UNIX or Linux system, use the launchpad.sh file.

3. On the Install IBM Maximo for Aviation 7.6.3 pane, select the check boxes for IBM DB2, IBM WebSphere Application Server Network Deployment, and IBM Maximo for Aviation 7.6.3, and click **Install**.

4. In IBM Installation Manager, specify the values for the database and the web server and complete the installation wizard. If you accept the default selection, Tivoli®'s process automation engine configuration program starts automatically.

5. Configure the installed components.

    a. In Tivoli's process automation engine configuration program, click **Prepare WebSphere Application Server for configuration**.

    b. Specify the information for the application server components and complete the wizard.

    c. Return to the main menu of the configuration program and click **Configure a New Deployment**.

    d. In the Define Deployment Environment pane, specify information about the database and the application server. To automatically configure the database, select **Create and configure the database**. To automatically configure the application server, select **Complete configuration of WebSphere for your product** and click **Finish**.

    e. In the Configure General Product Information pane, review summary details about the product components that you are installing. Specify the appearance and navigation features for your product, add an email address to receive workflow messages, and choose whether to deploy sample data.

    f. In the Configure the DB2 Instance pane, specify information about the IBM DB2 instance to create for Maximo for Aviation.

    g. In the Configure the DB2 Database pane, specify information about the IBM DB2 database to create for Maximo for Aviation.

    h. In the Configure the Application Server pane, specify information for the IBM WebSphere Application Server Network Deployment server that you installed. If you chose to use persistent messages, indicate whether you want to store JMS messages that originate from the integration adapter.

    i. In the Configure Application Security pane, choose a security model for Maximo for Aviation. If you choose a security model that includes a directory server, specify information about the directory for the virtual member manager. Enter the user names and passwords for users that must be created for Maximo for Aviation. Do not use the user name as a password value.

    j. Choose the base language and any additional languages that you want to install.

    k. In the Apply Deployment Operations pane, select all available deployment operations, and then click **Finish**.

6. When the installation and configuration processes are complete, log in to Maximo Asset Management and verify that Maximo for Aviation is listed in the System Information window.

Installing the build data interpreter service for Maximo for Aviation

Maximo for Aviation uses a high-performance build data interpreter (BDI) to validate operational changes to configuration-managed aircraft or equipment against the reference data and rules that are configured for the associated model. You must install the BDI service on the database server of your Maximo for Aviation deployment.

About this task

The BDI service requires Oracle Java™ Runtime Environment 6 or a later version.

After you install the BDI service, configure it for your environment.

To uninstall the BDI service, browse to the C:\v8\cmd directory, right-click the delete.bat file, and click **Run as Administrator**.

For information about installing the build data interpreter (BDI) with Maximo Asset Management Multitenancy, see www.ibm.com/support/docview.wss?uid=swg21970993.

Procedure

1. From the Maximo for Aviation installation directory, copy the v8.zip file from the *<maximo_home>*\tools\v8 directory to the database server.
2. Extract the v8.zip file to the C: directory so that the path to the v8.exe file is C:\v8\bin\v8.exe.
3. Browse to the C:\v8 directory and open the v8.ini file in a text editor.
4. Set the *database* variable to either **db2** or **oracle**.
5. Specify the corresponding *xdb-connect* and *xdb-login* variables for the database.
   a. Complete the JDBC string with the *<host>:<port>/<service>* values.
   b. Specify the database administrator user name and password.
6. Save and close the v8.ini file.
7. Optional: Test the configuration.
   a. Run C:\v8\cmd\v8-service-test.cmd. This command starts the V8 listener in the foreground.
   b. Run C:\v8\cmd\v8-service-test-client.cmd. This command repeatedly sends a test message <TX> every 3 seconds to the service and prints the received response <RX>.
8. Browse to the C:\v8\cmd directory, right-click the install.bat file, and click **Run as Administrator**.
9. From the **Start** menu, click **Start** > **Administrative Tools** > **Services** and locate V8 in the list of services.
10. Right-click the V8 service, and click **Properties**.
11. In the Application Management Properties window, click the **Log On** tab, specify an account with administrator rights and privileges, and click **Apply**.
12. On the **General** tab, specify the startup type, start the service, and click **OK**.
13. Log in to Maximo for Aviation as an administrator.

14. Go to the System Properties application, select **Filter**, and search for the property `psdi.plusa.v8hostname`.
15. In the **Global Value** field, replace <localhost> with either the server host name or the IP address of the computer where V8 is running.
16. If you change the port number in the `v8.ini` file, then you must replace the port number 1608 in the `psdi.plusa.v8hostname` system property.
17. Save the property. To make the change active, click **Live Refresh**.

Installing the mobile apps

The installation process involves running the installation and configuration programs on one or more computers.

Before you begin

Ensure that you have installed IBM Maximo Anywhere 7.5.2 or a later version on the computer where Maximo for Aviation is installed.

If you plan to install the Maximo for Aviation mobile apps on a designated build computer, copy the apps and the Maximo Anywhere compressed file to the target computer.

Before you can build and deploy mobile apps on the build computer, your system requires either the Android, iOS, or Windows development tools. For more information, see IBM Knowledge Center (www.ibm.com/support/knowledgecenter/SSPJLC_7.6.0/com.ibm.si.mpl.doc/install/t_set_up_buildserver.html).

About this task

A set of required components must be installed on the administrative workstation to extend Maximo for Aviation for the mobile apps.

For more information about the mobile apps, see www.ibm.com/support/docview.wss?uid=swg21970994.

Procedure
1. On the Maximo for Aviation computer, extract the compressed file that contains the mobile app.
2. From the extracted file, start the launchpad.
3. On the Install IBM Maximo for Aviation Required Components pane, click **Install** and complete the installation wizard. The configuration program starts automatically.
4. In Tivoli's process automation engine configuration tool, select **Update Database and Build and Deploy Application EAR Files** and complete the configuration wizard.
5. To install the mobile app on the computer where Maximo Anywhere is installed, copy the compressed file for the mobile app to the target computer.
6. On the Maximo Anywhere computer, extract the compressed file to a local directory.
7. From the extracted file, start the mobile app launchpad.
8. On the launchpad pane for installing the mobile app, click **Install**.
9. Complete the installation wizard.

10. Build and deploy the mobile apps by following the instructions in IBM Knowledge Center (www.ibm.com/support/knowledgecenter/SSPJLC_7.6.0/com.ibm.si.mpl.doc/build_deploy/t_ctr_build_deploy_apps.html).

Installing silently

A silent installation is useful for installing the product components on any computers that are configured in the same way.

Silent mode: Installing Maximo for Aviation

Instead of using the installation programs, you run commands by using either a generated response file that was created during the initial installation of Maximo for Aviation or by using a sample response file.

Before you begin

To create a response file during the installation of Maximo for Aviation, set the **record** environment variable. On a Windows computer, set **record=true**. On a UNIX or a Linux computer, export **record=true**. When you start the Maximo for Aviation launchpad, the response file is generated in the home directory of the user ID that started the program.

Alternatively, you can modify one of the following sample response files that are provided in the installation image:

Windows
- `ResponseFile_DB2_Install_Windows.xml`
- `ResponseFile_Aviation_Install.xml`
- `ResponseFile_TPAE_WAS_Install_Windows.xml`

UNIX and Linux
- `ResponseFile_DB2_Install_Unix.xml`
- `ResponseFile_Aviation_Install.xml`
- `ResponseFile_TPAE_WAS_Install_Unix.xml`

Ensure that the values in the response file are valid for the target system. The **installLocation** parameter and the **profile id** parameter must correspond with the existing Maximo Asset Management instance.

About this task

Sample response files are also provided for the uninstallation of the components.

Procedure
1. Copy the compressed installation image and response files to the target computer.
2. On the target computer, open a command prompt and change directory to the location of the Installation Manager program.

Option	Description
Windows	`cd C:\Program Files\IBM\InstallationManager\eclipse\tools\`
UNIX and Linux	`cd /opt/IBM/InstallationManager/eclipse/tools/`

3. Install DB2. Silently start Installation Manager by running the following command:

```
imcl -input responsefilename
-log logfilename -acceptLicense
```

The **-input** parameter determines the path to the response file, and the **-log** parameter determines the path to where the log files are written. The **-acceptLicense** parameter is used to accept the license automatically. For example, on Windows, run the following command:

```
imcl -input C:\tmp\ResponseFile_DB2_Install_Windows.xml
-log C:\tmp\silent_install_log.xml -acceptLicense
```

4. Install WebSphere Application Server Network Deployment. Repeat step 3 and replace the response file in the command with `ResponseFile_TPAE_WAS_Install_Windows.xml`.

5. Install Maximo for Aviation. Repeat step 3 and replace the response file in the command with `ResponseFile_Aviation_Install.xml`.

Silent mode: Installing the mobile apps

Instead of using the installation programs, you can install the required components and the app by running commands and sample response files.

Before you begin

The response files are provided in the app installation images. One response file is used to install the required components on the Maximo for Aviation computer and is named *<product_name>*_Silent_ResponseFile.xml. The other response file is used to install the mobile app on the Maximo Anywhere computer and is named *<app_name>*_App_Silent.xml.

Ensure that the values in the response file are valid for the target system. The **installLocation** parameter and the **profile id** parameter must correspond with the existing Maximo Asset Management instance.

About this task

This silent installation procedure has the same requirements as a non-silent installation of the mobile apps.

For more information about the silent installation of Maximo Anywhere, see the IBM Knowledge Center (www.ibm.com/support/knowledgecenter/SSPJLC_7.6.0/com.ibm.si.mpl.doc/install/t_ctr_silently_install_product.html).

Procedure

1. On the computer where Maximo for Aviation 7.6.3 is installed, extract the compressed installation image.

2. Open a command prompt and change directory to the location of the Installation Manager program.

Option	Description
Windows	`cd C:\Program Files\IBM\` `InstallationManager\eclipse\tools\`
Linux and UNIX	`cd /opt/IBM/InstallationManager/eclipse/` `tools/`

3. Silently start Installation Manager by running the following command:

```
imcl -input responsefilename
-log logfilename -acceptLicense
```

The **-input** parameter determines the path to the response file and the **-log** parameter determines the path to where the log files are written. The **-acceptLicense** parameter is used to accept the license automatically. For example, run the following command:

```
imcl -input C:\tmp\<product_name>_Silent_ResponseFile.xml
-log C:\tmp\silent_install_log.xml -acceptLicense
```

4. To install the mobile apps on the computer where Maximo Anywhere is installed, copy the compressed installation images to the target computer.

5. Extract the compressed file and repeat steps 2-3. Replace the response file name in the command with the *<app_name>*_App_Silent.xml file.

Updating Maximo for Aviation

If you already installed Maximo for Aviation 7.6.2, you can update the product to version 7.6.3.

Before you begin

Back up the middleware servers and the administrative workstation.

Procedure

1. Download the Maximo for Aviation 7.6.3 update package from IBM Passport Advantage and extract the installation image to a local directory.

2. Start the launchpad by double-clicking the launchpad file. If your computer is a Windows system, use the launchpad64.exe file. If your computer is a UNIX or Linux system, use the launchpad.sh file.

3. On the Update IBM Maximo for Aviation pane, click **Update**. IBM Installation Manager program starts.

4. In IBM Installation Manager, select **Update** and complete the update wizard.

5. Select **IBM Tivoli process automation engine configuration utility** and click **Finish** to start the configuration program. If the configuration program does not start, you can start it manually. In the *install_home*/ConfigTool directory, double-click the ConfigUI file.

6. In Tivoli's process automation engine configuration tool, select **Update Database and Build and Deploy Application EAR Files**.

7. From the Apply Deployment Operations panel, select the options for your environment and then click **Finish**

Option	Description
WebSphere Application Server	Select the options for applying changes to the database and automatically building and deploying application EAR files.
Oracle WebLogic Server	Select the options for applying changes to the database and automatically building the application EAR files. For WebLogic Server, you must manually deploy the application EAR files.

8. Complete the configuration program.
9. When the installation and configuration processes are complete, log in to Maximo Asset Management and verify that the latest version of Maximo for Aviation is listed in the System Information window.

Silent mode: Updating Maximo for Aviation

Instead of using the launchpad and update program, you can update the product by running a command and a sample response file.

Before you begin

Modify the `ResponseFile_Aviation_Update.xml` response file, which is provided in the update image.

Ensure that the values in the response file are valid for the target system. If you update the value for the **installLocation** parameter, you must also provide a new value for the **profile id** parameter.

About this task

A sample response file is also provided for the uninstallation of the components.

Procedure

1. Copy the response file and the compressed update image to the target computer.
2. On the target computer, open a command prompt and change directory to the location of the Installation Manager program.

Option	Description
Windows	`cd C:\Program Files\IBM\` `InstallationManager\eclipse\tools\`
UNIX and Linux	`cd /opt/IBM/InstallationManager/eclipse/` `tools/`

3. Silently start Installation Manager by running the following command:

```
imcl -input responsefilename
-log logfilename -acceptLicense
```

The **-input** parameter determines the path to the response file, and the **-log** parameter determines the path to where the log files are written. The **-acceptLicense** parameter is used to accept the license automatically. For example, run the following command:

```
imcl -input C:\tmp\ResponseFile_Aviation_Update.xml
-log C:\tmp\silent_install_log.xml -acceptLicense
```

Chapter 3. Configuring data after installation

After you complete the product installation, you configure initial data for your environment, such as organization options and aircraft or equipment attributes.

Defining values in dynamic value lists (DVL)

A dynamic value list (DVL) contains configuration-managed (CM) values that are used as the predefined and selectable values for field lookups. A DVL is defined at the part set level. Fields that use a DVL record can display only the records that are in the associated part set.

Values in dynamic value lists (DVL)

You can create and manage configuration-managed (CM) value records and define the CM values that are included in a dynamic value list (DVL). A dynamic value list is a group of CM values that share the same type value.

The CM values that you add to a dynamic value list become the predefined and selectable values for field lookups. The selectable field lookup values are filtered according to the CM value types. The name of the CM value type typically identifies the field name for which the dynamic value list applies.

For example, a dynamic value list with a CM value type of SYMPTOMS contains a list of values that can help you to define the **Symptom** field value on an event record. You can track symptoms of events for an aircraft or piece of equipment according to the detailed information that is on the CM value record that you have selected from the dynamic value list.

The CM value records that you create in the DVL Setup application can also include the following information that relates to the defined CM value type:

CM value findings
> The information about the CM position code of a configuration management or label system. The CM value findings can also include the information about the zone, condition, and the disruption index for the CM position.

CM value applicability
> The information about the series, or the model group and the specific model within a series. The selectable series and model values are filtered according to the selected CM position value. The CM value applicability can also include the information about the variation, build item, and CM part for the selected model.

How findings data is used with configuration-managed (CM) values

You can add findings data to a configuration-managed (CM) value record to define the CM position information that relates to the defined CM value type. The CM position is the code of the build position record that is associated with the dynamic value list record. The CM value findings can also include the information about the zone, condition, and the disruption index for the selected CM position.

The association between a CM position and a CM value is essential in capturing and tracking the detailed event information in the Events Management application. Event symptoms, failures, and actions can be tracked according to the defined CM position, series, and part information that you define on a CM value record.

For example, you can use the following CM value finding data to track the symptoms of a build position on an event record in the Events Management application:

- CM value - Engine problem
- Type - SYMPTOMS
- CM position - Engine
- Zone - Fan belt
- Condition - Used
- Disruption index - 1 (minor disruption)

Applicability values for configuration-managed (CM) values

You can add applicability values to a configuration-managed (CM) value record to define the series and model information that relates to the defined CM value type. The CM value applicability values can also include the information about the variation, build item, and CM part for the selected model.

The association between the series, model information, and a CM value is essential in capturing and tracking the detailed event information in the Events Management application. Event symptoms, failures, and actions can be tracked according to the defined CM position, series, and part information that you define on a CM value record.

For example, you can use the following CM value applicability values to track the symptoms of a build position on an event record in the Events Management application:

- CM value - Electrical problem
- Type - SYMPTOMS
- CM position - 2410
- Series - Boeing
- Model - 757
- Variation - 200
- Build item - Battery
- CM part - 123456

Creating configuration-managed (CM) values

You can create a configuration-managed (CM) value record to define the values that are part of a dynamic value list (DVL). The CM values and dynamic value lists that you create can be used throughout the product. The CM values that are on a dynamic value list become the selectable information for field lookups.

About this task

The CM value records are stored at the part set level. The selectable field lookup values are filtered according to the CM value types. The name of the CM value type identifies the field name for which the dynamic value list applies.

The CM value records can also include the findings and applicability information that relate to the CM value type. The CM value findings define the information about the CM position code of a configuration management or label system. The CM value applicability defines the information about the series, or the model group and the specific model within a series.

Procedure

1. In the DVL Setup application, click the **New DVL Setup** icon.
2. Specify values for the type, value, and description.
3. Save the record.

Maintaining fleet definitions

To effectively manage your aircraft or equipment, you can create fleet definitions, which group similar aircraft or equipment together for the purpose of managing and performing tasks, such as updating meters.

Creating fleet definitions

A fleet definition logically groups related aircraft or equipment for the purposes of meter reading entry and preventive maintenance tasks. This grouping of aircraft or equipment can be shared by model, variation, or attribute values. For example, you can create a fleet of aircraft engines to enable rapid entry of meter reading values in the Fleet Usage Load application.

Before you begin

Before you create a fleet definition, you must set the aircraft or equipment attributes in the Models application and Aircraft and Equipment Attributes Setup application.

Procedure

1. In the Fleet Management application, on the toolbar, click the **New Fleet Management** icon.
2. Specify a unique identifier for the fleet.
3. Specify any other required information for the fleet.
4. Specify values for model and variation.
5. Optional: To provide specific attributes for an aircraft or equipment fleet, in the Fleet Definition Attributes table, add as many rows as required and select the values for the fields.
6. Optional: If you want to specify meters for the fleet, in the Fleet Utilization table, add as many rows as required and select the values for the fields. Each combination of utilization value and utilization by period must be unique.
7. Save the record.

Updating fleet definitions

If you change the fleet definition and must have the changes updated immediately, you can evaluate the fleet definitions without waiting for the cron task. You can opt to evaluate all fleet definitions or only the current fleet definitions.

Procedure

1. In the Fleet Management application, select a fleet definition record.
2. Update the fleet definitions:

- To update only the active fleet definitions, from the **Select Action** menu, select **Evaluate Current Fleet Definition**
- To update all fleet definitions, **Select Action** menu, select **Evaluate Fleet Definition**

Scheduling the updating of fleet definitions

You can schedule and run a cron task to periodically check for any changes to all the fleets and the associated aircraft or equipment. For example, if you add a new meter to a fleet, the cron task identifies the new meter and adds it to all affected aircraft or equipment in the fleet. The cron task runs every three hours.

Procedure

1. In the Cron Task Setup application, on the toolbar, click the **New Cron Task Definition** icon.
2. On the **Cron Task** tab, set the cron task name to "EvalFleets" and specify "Evaluate ALL Fleets" as the cron task description.
3. Set the class to psdi.plusa.app.plusafleet.PlusACMEvaluateAllFleetsCronTask.
4. Set the access level to FULL.
5. In the Cron Task Instances table, set the cron task instance name to "ALL Fleets".
6. Specify "3h,*,0,*,*,*,*,*,*,*" as the schedule for the cron task instance.
7. Keep the default values for the **Run as User** field and the **Active** check box.
8. Save the record.

Creating fleet usage loads

To simplify data entry and manage aircraft or equipment in a highly regulated industry, you can create fleet usage load records to manage the meter life usage of aircraft or equipment fleets. After you create a fleet usage load record, you can then update meters for the entire fleet using a single tab in the application.

Before you begin

Before you create fleet usage loads, you must create fleet definitions in the Fleet Management application.

Procedure

1. In the Fleet Usage Load application, click the **New Fleet Usage Load** icon.
2. Select the fleet name.
3. If you did not set default fleet values in the Fleet Management application, specify the values for the **Meter 1**, **Meter 2**, **Reading Type 1**, and **Reading Type 2** fields.
4. Save the record.

Setting up aircraft or equipment attributes

Aircraft or equipment attributes records define the status of an aircraft or piece of equipment in relation to its meter life use and configuration on a specified date. You use the Aircraft or Equipment Attributes application to create aircraft or equipment attribute set up records.

Aircraft or equipment attribute records

Aircraft or equipment are user-defined attributes that you can create and use to record and maintain a history of attribute changes over the life of an aircraft or piece of equipment. Each time the attribute value is changed, the date and time is recorded, and a meter count can also be recorded..

You create and manage attributes and their associated values for an aircraft or piece of equipment. You can also determine whether all the child aircraft or equipment inherit the aircraft or equipment attribute values that are associated to a parent aircraft or equipment record.

When an attribute change is saved, all previously defined values for the selected attribute are written to history for future reference and analysis. You associate the attribute values and attribute changes to aircraft or equipment in the Aircraft and Equipment Attributes application.

Creating aircraft and equipment attribute setup records

An aircraft or equipment attribute setup record defines aircraft or equipment attributes and their associated values. You use aircraft or equipment attributes to define the status of an aircraft or piece of equipment in relation to its meter life use and configuration on a specified date.

Procedure

1. In the Aircraft and Equipment Attributes Setup application, click **New Aircraft or Equipment Attributes Setup**.
2. Specify a name and description for the aircraft or equipment attribute.
3. Optional: Specify a site or an organization. You can define an aircraft or equipment attribute record at the system, organization, or site level. If you specify a site, the value for the organization is automatically specified.
4. Optional: If you do not want child aircraft or equipment to inherit the aircraft or equipment attribute values that are associated with an aircraft or equipment record, clear the **Overwrite Subs** check box.
5. Optional: If you want the aircraft or equipment attribute record to be replicated in the target site when an aircraft or piece of equipment is transferred to that site, select the **Transfer on Site Move** check box. An aircraft or equipment attribute record is transferred to the target site only both the attribute and attribute value are valid in the target site. For example, an aircraft or equipment attribute record is defined at the site level in the BEDFORD site. If you transfer the aircraft or piece of equipment to the NASHUA site, the aircraft or equipment attribute cannot be replicated in the NASHUA site.
6. In the Aircraft or Equipment Values table, add a row and specify a value for the aircraft or equipment attribute.
7. Optional: Specify whether the attribute value is visible for selection in the Aircraft and Equipment Attributes application.
8. Optional: Specify whether the attribute value is used as the default attribute setup value.
9. Specify values for associated values that are used in reporting.
10. Save the record.

Configuring options for organizations

After installation, use the Organizations application to set default values for options related to models and shipments.

Configuring model options for organizations

When you create models for configuration-managed aircraft or equipment, you specify values such as the label system and meters. Configure this data before you start defining models.

Procedure

1. In the Organizations application, select an organization and then select the **CM Options** action.
2. In the CM Options window, specify the default label system that you plan to use.
3. Optional: Select the following check boxes if you want to enable that functionality:
   a. **Record Meter Offsets**
   b. **Update Aircraft or Equipment Location on Installation**.
   c. **Manage Fuel, Replenishments, and Munitions in the Inventory Applications**
4. Click **OK**.
5. Select the **System Settings** action.
6. Click **OK**.

Configuring shipment options for organizations

In the Organizations application, you specify which transactions automatically create shipments or shipment requests. For example, you can configure exchange order transactions to automatically create shipment requests. For outbound repair or exchange purchase orders, you can specify a shipment status that automatically moves or issues equipment to a destination location.

Procedure

1. In the Organizations application, select the organization that you want to configure.
2. Select the **Shipment Options** action.
3. Specify one of the following values for inbound and outbound exchange orders:

Value	Description
None	No automated shipment handling.
Request	Shipment requests are created automatically.

4. Specify one of the following values for each of the remaining transaction types:

Value	Description
None	No automated shipment handling.
Request	Shipment requests are created automatically.
Shipment	Shipments are created automatically.

5. In the **Repair or Exchange Purchase Order - Outbound** field, select the shipment status that automatically moves or issues equipment from its current location to the destination location that is specified on the purchase order line.

6. Click **OK**.

Configuring validation options for models

The build data interpreter (BDI) service validates operational changes to configuration-managed aircraft or equipment against the reference data and rules that are defined for the associated model. After you install the BDI service, you configure it for your environment.

Build data interpreter service

The build data interpreter (BDI) service provides multithreaded support to manage synchronous and asynchronous validation requests.

Service threads

The BDI service includes the following threads:

daemon thread
Monitors and controls active configuration-managed components.

monitor thread
Periodically processes transactions in a queue that is stored in the PLUSAANTRAN table in the Maximo database.

VREX thread
Periodically processes the entire fleet of end items, in a way that is similar to cron task processing.

Service cache

The BDI service stores records in a cache to speed retrieval and performance. You can configure a cache mode setting that controls whether the BDI service uses existing files from the cache or rebuilds files from the Maximo database. The cache can operate in any of the following modes:

normal-cache mode
The service uses existing cache files that were built and maintained when the service was last run. If no existing cache files exist, the service builds them incrementally.

rebuild-cache mode
The service deletes any existing cache files and starts rebuilding its cache from the Maximo database. Depending on the size of the database, a full rebuild can take a long time.

quick-start mode
The service deletes any existing cache files and rebuilds its cache files from the Maximo database. In quick-start mode, the service rebuilds the deleted files incrementally.

When the service starts in rebuild-cache mode, if the Maximo database is small, the BDI service takes a few minutes to start. If the Maximo database is large, for example, during performance testing, the service can take hours or days to start. For testing purposes, you can use a filter to reduce the number of records that are loaded into the cache when the service starts. For example, if you set the

v8-cache-filter initialization variable to ABC%, only aircraft or equipment records with an aircraft or equipment number that starts with ABC are loaded into the cache.

BDI service command line interface example

A command line interface, which is located at `<install_home>\v8\vex.cmd`, provides access to the service for administration and testing. The following example shows how to perform a status validation check:

1. Enter 1 to connect to the BDI service.
2. Enter `VR` to show responses.
3. To validate the current configuration, enter `VC:9999`, where *9999* is the ID of an end item aircraft or equipment.
4. Enter `VL:9999;1;2` where 1 is a configuration ID and 2 is a revision number.
5. Enter `VL:9999;3/4;5` where 3 and 4 are other configuration IDs and 5 is a revision number. The VL command validates a list and you can add an unlimited number of configuration IDs to the list.
6. Enter `VU` to run the BDI service in update mode.
7. Enter x to disconnect from the BDI service.

Configuring the validation service

You configure the build data interpreter (BDI) utility to run as a service in your environment. The service monitors and validates the status of configuration-managed aircraft or equipment and supports synchronous and asynchronous validation requests.

About this task

During installation, the database values for the service are configured in a service initialization file, and other default values are set. You can review and modify the service configuration values that are in the initialization file.

Procedure

1. In a text editor, open the `<install_home>`/v8.ini file.
2. Configure the *service-address* variable to use the location where the service is hosted. The service client can be located anywhere on the network and uses this value to connect to the host.
3. Optional: If you do not want to use the default port number of 1608, configure the *service-listener-port* variable.
4. Configure the *socket-timeout-secs* variable to the number of seconds of inactivity on an established connection before the connection times out. If you do not specify a value, the default value of 180 seconds is used. Test messages that are sent by the service client are not considered to be an activity when determining when the connection times out.
5. Configure the frequency at which threads are processed.

Option	Description
daemon-pulse-secs	The number of seconds that elapse between the sending of daemon thread pulse messages. If you do not specify a value, the default value of 60 seconds is used.

Option	Description
monitor-pulse-secs	The number of seconds that elapse between the sending of monitor thread pulse messages. If you do not specify a value, the default value of 60 seconds is used.
vrex-pulse-mins	The number of minutes that elapse after the VREX thread processes all end items before the VREX thread runs again. If you do not specify a value, the default value of 60 minutes is used.

6. Configure the cache mode.
7. To apply these changes to the initialization file, stop the BDI service and restart it.

Configuring a start center portlet to display BDI information

You use the Result Set portlet to define that aircraft or equipment must be displayed with the BDI color coding, BDI status value, date and time.

Procedure
1. Add the **ACM Result Set** portlet to the Start Center.
2. On the portlet setup, select the **BDI_ASSETS** query.
3. On the **Column Display** tab, select the columns you want the portlet to display. You have to select the **PLUSARBDICOLOR** column to display the aircraft or equipment with the BDI color coding.
4. Save the setup.

Configuring system settings

After installation, you perform system configuration tasks to ensure that your installation functions according to your service provider business needs.

Specifying SLA options

You can configure how service level agreements (SLAs) are applied and used.

About this task

All of the configuration settings are optional. All settings except for SLA Hold are set for each site.

Procedure
1. In the Organizations application, select the organization for which you want to set service level agreement options.
2. From the menu, select **SLA Options**.
3. To allow SLAs on tickets to be put on hold, select the **Allow SLA Hold to be Applied on SLAs** check box. This setting applies to all organizations. If you select this check box, SLAs for tickets can be put on hold, which adds time to the resolution target and stops any escalation activities. Typically, tickets are placed on SLA hold when the service desk analyst is waiting for a response from the individual who submitted the ticket. Not all installations have the SLA Hold function. If your installation does not have SLA Hold function, this check box is not editable.
4. In the SLA Options window, select the site to which you want the remaining settings to apply.

5. Select from the following options:

Option	Description
Allow Application of One SLA	To apply one matching SLA to a record. The matching SLA with the highest ranking value is applied. The highest ranking is 1 and the lowest ranking is 99999.
Allow Application of Multiple SLAs	To apply all matching SLAs to a record. If you select this option, you can configure other options.
Apply Multiple SLAs Based on Ranking	If you apply all matching SLAs to a record, have the SLA with the highest ranking update the target dates on the record.
Apply Multiple SLAs Based on Commitment Stringency	If you apply all matching SLAs to a record,have the SLA with the most stringent commitment times update target dates on the record.
Use Calendar for Calculating Escalation Point Condition	To specify that calendars are used if the escalation originated from an SLA.
Disable Calendar for Calculating Escalation Point Condition	To specify that calendars are not used if the escalation originated from an SLA.

6. Repeat for each site that you want to configure settings for, and click **OK** when you are finished.

Bill batch copy options

You can add schedules to customer agreements that create bill batches for all price schedules on the agreement. You also can use a cron task to copy bill lines for work orders, tickets, and sales orders to existing bill batches, or you can copy bill lines in the background or foreground immediately.

Automated billing of all price schedules

You can set up automated billing of all price schedules on a customer agreement. Specify a billing schedule that creates bill batches for all price schedules on a customer agreement. You can specify that bill batches are grouped by order number, customer purchase order number, customer cost center, or the reporting user. Schedules can be set up by calendar or by financial period.

The PLUSPBILLPSGENCRONTASK cron task runs on the schedule that you specify.

Automated copy of bill lines to a bill batch

You can schedule a cron task to regularly copy bill lines for work orders, tickets, and sales orders to an existing customer bill batch. The scheduled task runs as a background process.

To set up the scheduled task, open the PLUSPCOPYBILLLINESCRONTASK record in the Cron Task Setup application. By default, the schedule is set up to run once a month. In most cases, you replace only the *customer* variable with the customer name from the bill batch.

Immediate copy of bill lines to a bill batch

When you copy bill lines to a bill batch in the Customer Billing application, the option to copy lines in the background is displayed. If you copy in the background, you can specify one or more email addresses for notification when copying finishes. While lines are being copied to a batch, you cannot select or copy bill lines or modify the record.

After each 100th bill line is processed, records are committed to the database.

If a copy process fails and must be restarted, select the action to start the copy again. Do not restart the process unless there is a failure, such as a server failure. The action erases all copy history and starts the copy process again.

Configuring access to restart the copy process for bill batches

You can configure security settings to allow members of a security group to restart the copy process for a bill batch that is in progress.

About this task

Authorized users can restart the process to copy bill lines to a bill batch in a background mode with the **Reset Copy in Progress** action in the Customer Billing application.

You enable user access to this action by associating its signature option with one or more security groups. Then, you associate a conditional expression with the signature option. The conditional expression to be associated with the signature option is configured for you.

Users who select this action are warned to not restart a copy in progress unless the process failed, such as with a server failure. Restarting the copy process deletes all history for the copy that was in progress.

Procedure

1. In the Security Groups application, select the security group to configure.
2. On the **Applications** tab, in the applications list, select Customer Billing . In the Options for Customer Billing section, select the Reset Bill Batch signature option.
3. In the Details section, grant access to this signature option and associate the PLUSPBBRESET condition with the signature option.
4. Save the record. Log off from the system to complete the configuration.

What to do next

Test that the **Reset Copy in Progress** action is only available to authorized users. Test as a user who does not have access to the action and as a user who has access.

Setting billing options

You can specify the status at which completed work can be added to a bill batch. You also can specify whether to display a message about an existing open bill batch when you create a new batch for the same customer agreement.

About this task

When you specify billing status for work orders, including activities, changes, and releases, the option does not apply to work orders that are linked to a price schedule that has the **Bill Approved Work** option selected. On these types of work orders, approved transactions are selected for billing on open work orders.

Procedure

1. In the Organizations application, select the organization for which you want to set billing options.
2. Select **Service Provider Options** > **Billing Options**. For each record type, select that status at which that record is billable. Billing objects are selected for a bill batch based on the status and the completion date.
3. Optional: If you do not want to display a message about an existing bill batch when a new batch is created for the same customer agreement, select **Service Provider Settings** > **Customer Billing Options** and deselect the check box.
4. Save your changes.

Configuring ticket options

You can configure the product to filter ticket owners by the customer that is associated with an aircraft or piece of equipment, location, or reporting user on the ticket.

Procedure

1. In the Organizations application, select **Service Provider Settings** > **Ticketing Options**.
2. To filter the ticket owners by the customer that is associated with an aircraft or piece of equipment, location, or reporting user on the ticket, select the check box.

Activating automated billing

The PLUSPBILLGENCRONTASK cron task initiates the processing of automated billing schedules. Cron tasks are jobs that run in the background automatically and on a fixed schedule. You activate the PLUSPBILLGENCRONTASK cron task if you want to be able to create customer bills that are based on billing schedules.

Procedure

1. In the Cron Task Setup application, select the PLUSPBILLGENCRONTASK cron task.
2. In the Cron Task Instances section, select the **Active** check box for the PLUSPBILLGENCRONTASK cron task.
3. Reload the cron task by selecting the **Reload Request** action.
4. In the Reload Request window, select the PLUSPBILLGENCRONTASK instance that you want to reload.
5. Click **OK**, and save the changes to the cron task.

Best practices: Data preparation for scheduling

Many factors affect the ease and effectiveness of scheduling. By preparing your data ahead of time, you can ensure that your work can be scheduled effectively.

Calendar and shift information

Set up your calendar with shift and shift break information. Include all shifts that you want to schedule work for. Ensure that your calendar extends far enough into the future. For example, if you want to plan your work out for the next six months, ensure that your calendar information extends out for six months.

Craft, crew, and labor information

Set up your crafts and crew types so that they can be specified on job cards and work plan labor. Set up labor and crews with their appropriate shifts and ensure that they are available for assignments.

Work orders and tasks

Divide your work orders and other work records into smaller tasks so that each task can be scheduled and divided between resources as needed. Plan your resources at the level that they are managed. For example, if you assign entire work orders, the resource requirement must be at the work order level. If you assign individual tasks within a work order, the resource requirement must be at task level. If you require resources at the task level, you must include tasks in the schedule to see them in the Gantt view.

Use the **Interruptible** check box to schedule work only during work time. If a task or work order is not interruptible, it is scheduled in a single block that might include non-work time.

Job card information

Review your job cards to ensure that they require the appropriate craft and crew types. Also, carefully review job card durations.

Durations affect scheduling and cost calculations. Ideally, all durations for craft requirement should be for the entire length of the job card. For example, a 2 hour job card for fire hydrant maintenance would require 2 hours for a plumber and 2 hours for a mechanic. Job card and work order durations are synchronized in the Gantt view.

Service addresses

Create service addresses for aircraft and locations. When you enter an aircraft or location as a service address, XY coordinates are calculated for each aircraft and location. You can then view work graphically on the **Dispatch** tab in the Gantt view of the Graphical Assignment application.

Chapter 4. Security

You can use the Security Groups application to set restrictions on who can access records. For example, you can limit the viewing of models to technical and maintenance personnel. You must configure security restrictions to control access to customer data.

Predefined security groups

Predefined security groups are used to restrict access to applications according to user roles and responsibilities. When you add users to a predefined security group, their application access is restricted to the applications that they require to perform their work.

Multiple organization-based security groups are provided with Maximo for Aviation. The required license for a user is defined by the organization-based security group. Every user must be included in one organization-based security group. You can create new groups that are subject to existing usage restrictions.

Each organization-based security group is associated with one of the following license types:

- Full
- Limited use
- Express
- Anywhere

Most organization-based security groups include multiple role-based security groups. A customer can be added to a role-based security group to provide access that is based on his or her role. Each role-based security group has a unique Start Center. For example, the ENGINEER security group is role-based and might include roles such as Engineering Specialist, Reliability Analyst, Technical Library Manager, and Maintenance Program Engineer.

You can use SQL queries to retrieve a list of role-based security groups and their associated applications from the database.

Querying predefined security groups

You can run SQL queries to list all of the security groups and their associated roles that are unique to IBM Maximo for Aviation MRO. You can also run a query to list the applications and permission types for each security group.

Procedure

1. In the database, run the following SQL query to list all predefined security groups:

```
select groupname, description from maxgroup where groupname in
('ACCOUNTANT', 'ACMTCEMGR', 'BMTCEMGR', 'CERTSTF', 'CTCMKTMGR', 'CUSORDSK',
'CUSTOMER', 'ENGMGR', 'ENGSPEC', 'FINCTL', 'FINMGR', 'HUMRES', 'LMTCEMGR',
'MATMGR', 'MATPLAN', 'MCCCTRL', 'MTCEPLN', 'MTCEPRENG', 'PRODCTL', 'PURCHASER',
'RECSPEC', 'RELYANLT', 'SMSALST', 'SMSMGR', 'STOKEEPER', 'TECHNICIANS',
'TECLIBMGR', 'TECLIBSPEC', 'TECPLNMGR', 'TECSRVMGR', 'WAREMGR', 'WARRMGR',
```

```
'WKSPMGR', 'ML_CONTRACT', 'ML_ENGINEER', 'ML_FINANCE', 'ML_HUMRES',
'ML_LOGISTICS', 'ML_MAINTENANCE', 'ML_PLANNING', 'ML_QUALITY', 'ML_SAFETYMGNT',
'ML_SALES', 'ML_TECHANY', 'ML_TECHNICAL', 'QUALMGR', 'QUALAUD', 'QUALCTRL')
```

2. To list all the applications that are available for the selected security group,
   replace the placeholder <GROUPNAME> with the name of your security group
   in the following SQL query:

```
select auth.groupname,app.description,auth.optionname
from applicationauth auth, maxapps app
where auth.groupname='<GROUPNAME>' and auth.app=app.app and auth.optionname
in ('INSERT','SAVE','READ','DELETE')
order by app.app
```

Organization-based security groups and associated roles

Organization-based security groups manage user licenses. The following table lists
the organization-based security groups and the role-based security groups that are
associated with them:

Table 8. Organization-based security groups and associated role-based security groups.

Organization-based security groups	Associated Role-based security groups
ML_CONTRACT	Contract & Marketing Manager
ML_ENGINEER	Engineering Manager, Engineering Specialist, Reliability Analyst
ML_FINANCE	Financial Manager, Accountant, Financial Controller
ML_HUMRES	Human Resources
ML_LOGISTICS	Material Manager, Purchaser, Material Planner, Store Keeper, Warehouse Manager, Warranty Manager
ML_MAINTENANCE	Aircraft Maintenance Manager, Base Maintenance Manager, Line Maintenance Manager, Workshop Manager
ML_PLANNING	Technical Planning Manager, Maintenance Planner, Records specialist
ML_QUALITY	Quality Manager, Quality Auditor, Quality Controller
ML_SAFETYMGNT	SMS Manager, SMS Analyst
ML_SALES	Customer, Customer Order Desk
ML_TECHANY	Technician, Mechanic - Anywhere license user
ML_TECHNICAL	Technician, Mechanic - Express license user

Restricting access to aircraft or equipment and models

You can restrict the access of users to aircraft and equipment, related records, and
models, by setting restrictions for user groups based on the user group type or
aircraft or equipment attributes.

Before you begin

To restrict access based on an aircraft or equipment attribute or to restrict access to
models, the **Security Restriction** check box for the attribute or model must be
selected in the Aircraft or Equipment Attributes Setup application.

Procedure

1. In the Security Groups application, on the **List** tab, select a user group.
2. On the **ACM Restrictions** tab, in the Aircraft or Equipment Attribute Restrictions table, specify attributes and values to allow the user group access to aircraft or equipment with these attributes and values.
3. In the Model Restrictions table, specify the models that the user group can access.
4. In the Entity Restrictions table, define an SQL statement.
5. Save the user group.

Customer security

You must configure security to ensure that only authorized users can view information about customers.

Access to customer-level data

You can provide access to customer records by defining authorization levels and data restrictions in the Security Groups application. You can define the levels of access to security groups with different customer-level information.

The customer-level objects that can be restricted according to customer, and their restriction conditions, are defined in the Customer Objects application. The level of customer authorization determines the level of access to these objects. Customer-level data provides information that directly refers to a customer or is indirectly associated with a customer. Customer-level data restrictions work within the larger set of application restrictions and with other object, attribute, and collection restrictions to form the overall security profile of a security group and its users. A person record can list other customers to which the person has access, in addition to the person's employer. If the person is an employee of the service provider and can access all of the customers of the provider, that user's person record would list all of the customers.

Some customer-level data is unrestricted because it is not associated with a customer. For example, aircraft or equipment that belong to the service provider, instead of its customers, do not have customer associations. Any users can see these aircraft or pieces of equipment if they belong to a security group that allows access to unrestricted data.

Levels of customer authorization

You use customer authorization settings in the Security Groups application to set the level of access a security group has to customer-level information.

You can assign each security group one of five levels of customer authorization. The selected level of authorization applies to all users in the security group. If a user requires more than one type of authorization, create additional security groups and assign the user to each of them. His or her customer-level data restrictions are based on the combination of settings for all of the groups.

You can assign a security group one of the following levels of access:

- Access to all customer-level information

- Access to customer-level information that is not associated with a customer

-
   Access to information only about a user's employer
-
   Access to information only about a user's assigned customer list
-
   Access to information about specific customers

Access to all customer-level information

You can authorize a security group to access all customer-level information. Users with this level of customer authorization can access information that is associated with any customer and any customer-level information that is not associated with a customer.

For example, Hamed is the director of operations for a service provider. He is responsible for all maintenance activities for all customers of the service provider and requires access to all customer agreements and transactions. As a result, Hamed belongs to a security group that is authorized to access all customer-level information.

Access to customer-level information that is not associated with a customer

You can authorize a security group to access only unrestricted customer-level information. Users with this level of customer authorization can access all information that is not associated with a customer.

For example, Best Services owns the fire extinguishers that its customers use, so no customers are associated with those pieces of equipment. Josh is responsible for checking all of the fire extinguishers on behalf of Best Services. He has no customer responsibilities. Josh is in a security group with access to unrestricted customer-level information only so that he can view details about the fire extinguishers but not about any pieces of equipment that the customers own.

Access to information only about a user's employer

A security group can allow its users access to customer-level information for the users' employers only. A user in a group with this level of customer authorization can access customer-level information for one customer; the company in the Customer/Vendor field on his or her person record in the People application. These users typically are restricted to using only the Self Service applications and the Bill Review application.

Users with this level of customer authorization cannot access unrestricted customer-level information, except for unrestricted classifications and attributes.

For example, Maria works for the International Sailing Association (ISA), a customer of the service provider Best Services. Maria's person record in the People application has the value ISA in the Customer/Vendor field because ISA is her employer. She belongs to a security group that has access to users' employers. As a result, she can view all customer-level information for ISA. She cannot view customer-level information for any other customers of Best Services, nor can she view any customer-level information that is not associated with a customer, except for unrestricted classifications and attributes.

The users in this group are typically employees of a service provider's customers, and have limited access to data and applications. For example, these users typically can access only the Self Service and Bill Review applications.

Access to information only about a user's assigned customers

A security group can be authorized so that its users can access all of their assigned customers. A user in a group with this level of customer authorization can access customer-level information for all of the customers that are listed on the Customer Access List in the People application.

Users can also access all information that is not associated with a customer.

For example, Edouard is a customer service agent who is assigned to support Acme Products and Alpha Industries. The customer access list on the person record for Edouard lists these two customers, and he belongs to a security group with access to any customer on the user's customer access list. As a result, Edouard can view all customer-level information for these two companies.

Because a co-worker is absent, Edouard must also handle calls from the XYZ Corporation for today. Regina is the service desk manager and has access to XYZ corporation, in addition to Acme Products and Alpha Industries. Instead of changing Edouard' security profile, Regina uses the People application to add XYZ Corporation to Edouard's customer access list. Edouard can now work with Acme Products, Alpha Industries, and XYZ Corporation for the duration of his shift. Regina can remove XYZ Corporation from Edouard's customer access list at the end of his shift.

Access to information about specific customers

You can authorize a security group so that its users can access information about specific customers. A user in a group with this level of customer authorization can access all customer-level information for all of the customers that are listed in the Individual Customer Authorization list for the security group.

Users can also access all information that is not associated with a customer.

For example, Elena and Max are service desk agents who work for a service provider. Elena is responsible for Acme Products and General Manufacturing. Max is responsibile for Alpha Industries and XYZ Corporation. If either Elena or Max is away, the other takes on responsibility for his or her customers. Elena and Max belong to a security group that gives them access to the customers listed in the Individual Customer Authorization list. Acme Products, General Manufacturing, Alpha Industries, and XYZ Corporation are all in the list for the security group so that both Elena and Max, and any other service desk agents in the same security group, can access all four customers as necessary.

Customer access lists
The security profile for a person can provide access to any customers on the customer access list for that person. With this type of security profile, the customer access list shows all the customers that a person can work with.

When a person must work with a different list of customers, for example, when responsibilities change, you can change the customers on the customer access list.

You do not need to create a security profile for that person. You view and change customer access lists for a person on the **Customer Access** tab of the People application.

Example of temporary changes to a customer access list

Eduard is a customer service agent assigned to support Acme Products and Alpha Industries. The customer access list on the person record for Eduard lists these two customers. He belongs to a security group with access to any customer on the customer access list of the user. As a result, Eduard can view all customer-level information for these two companies.

Because a co-worker is absent, Eduard must also handle calls from the XYZ Corporation for today. Regina is the service desk manager and has access to XYZ corporation, in addition to Acme Products and Alpha Industries. Instead of changing Eduard's security profile, Regina uses the People application to add XYZ Corporation to Eduard's customer access list. Eduard can now work with Acme Products, Alpha Industries, and XYZ Corporation for the duration of his shift. Regina can remove XYZ Corporation from Eduard's customer access list at the end of his shift.

Customer data objects and restriction conditions

You use customer data objects and restriction conditions to grant or restrict access to customer-level information. The customer data objects and conditions, and the customer authorization settings for a security group, determine the customer-level information that users can access. The objects and restriction conditions apply to all security groups in the Security Groups application.

Customer data objects are listed in the All Customer Objects table window in the Customer Objects application. The list shows all of the data objects for which customer-level data restrictions have been set up.

The restrictions are defined in the Restriction Condition table window.

You can add or remove objects and conditions or change the default conditions. You can refresh the list to its original state, with the full set of conditions for all customer-level objects, by using the Create Default Conditions action.

You can also view all conditions created in the Customer Objects application in the Conditional Expression Manager application.

For example, if it is specified that a group has access to the Customer object if the customer is ABC Corporation, then members of this group can see the ABC Corporation customer record in the Customer application. For users in this group to also see work orders for ABC Corporation, the security group must have access to the Work Order object for that customer.

The restriction conditions are set up already for all of the default customer objects. If you add customer-level objects by using the Database Configuration application, create a customer data object restriction for each main object that refers to a customer to ensure that access to the customer is fully restricted to the appropriate security groups. A main object is the main record within an application, such as Location object in the Locations application.

Restriction types

Restrictions can be one of the following types:

*   Qualified:

    Qualified restrictions prevent access to a main object. Only main object data that meets the condition qualifies to be seen or accessed. Qualified restrictions do not apply to child records or attributes.
*   Hidden

    Hidden restrictions assert that descriptive information about the object is hidden rather than being displayed in detail on another object.

For example, in the Equipment application, Equipment is the main object. A qualified restriction on Equipment restricts access, according to customers, to equipment in the Equipment application. In the Locations application, pieces of equipment are shown on the Equipment tab. The main object in this application is Location, not Equipment, so the qualified restriction on the Equipment object does not restrict access to the equipment information shown in the Locations application. However, a hidden restriction for the Equipment object would prevent the equipment from being shown in the Locations application. So, to restrict access to all equipment information in all applications, based on customer, both qualified and hidden restrictions are applied to the Equipment object.

Each object can have up to ten assigned conditions-one for hidden restrictions combined with each of the five levels of customer authorization in the Security Groups application, and one for qualified restrictions combined with each of the five levels of customer authorization.

Default customer objects and restriction conditions:

Default conditions are standard customer objects and the restriction conditions for those objects, used when you set up customer authorization for security groups in the Security Groups application. These objects and conditions are set up by default in the Customer Objects application, but you can modify or remove them, and you can add other objects and conditions.

You typically add objects or conditions to the default list only if you create your own customer-level objects using the Database Configuration application.

If you modify or remove objects or conditions, you can use the **Create Default Conditions** action to refresh the lists so that the original items and settings are specified. You can choose to keep any new objects and conditions that you added.

The default conditions created in the Customer Objects application are shown in the Conditional Expression Manager application with a prefix of BMXAQ and with a description that indicates the customer object that the condition is applied to. This enables you to identify the default Customer Objects conditions when you use the Conditional Expression Manager to manage all of your system-wide conditions.

All customer objects and restriction conditions that you create or modify are applied to all security groups. If you refresh the lists to use the default objects and conditions, the default objects and conditions are applied to all security groups.

Securing customer information

Use security groups, customer data objects, and security policy settings to ensure that customer information can be viewed only by users who have access to that customer.

Specifying customer authorization conditions

You can add customer data objects and restriction conditions. The Security Groups application uses these objects and restrictions for customer authorization to determine the customer-level information that users can access.

About this task

You can add up to ten conditions for each object that you add; one for each combination of one of the two types of restrictions and one of the five levels of customer authorization in the Security Groups application.

Procedure

1. In the table window of the Customer Objects application, select **New Row**.
2. Specify the object that you want to add for customer authorization.
3. Add a restriction condition to the object.
    a. Open a new restriction condition.
    b. Specify the restriction option to indicate the level of customer authorization that the condition applies to.
    c. Optional: Modify the assigned condition number.
    d. Enter an expression to specify the condition type.
    e. Enter the type of restriction.
4. Save the customer object.

Configuring access to the Bill Review application

If you want to allow customers to review billing information in the Bill Review application, you need to configure security access to the application.

Procedure

1. In the Security Groups application, create a security group for users who can access only the Bill Review application.
2. Optional: If you want the access rights of this group to not be combined with other security groups, select the **Independent of Other Groups** check box.
3. In the **Default Application** field, specify PLUSPPBILL.
4. On the **Sites** tab, specify the sites for users that can access the application. Either select the **Authorize Group for All Sites** check box or add sites to the Sites table.
5. On the **Applications** tab, select the row for the Bill Review application. In the **Grant Listed Applications** list, select the access level to grant.
6. In the Options sections, select the **Grant Access** check box for the signature options that you want to enable or select all options with the **Grant Listed Options for This Application** check box. You can specify conditions for each option.
7. Save the record.

What to do next

Add users to this group. You can add users in this application or you can associate this security group with users in the Users application.

Chapter 5. Planning for regulatory compliance

Maintenance activities on aircraft are highly-regulated and must comply with the standards set down by the maintenance steering group (MSG-3) for the airline industry. Maximo for Aviation provides applications for defining operator maintenance programs and importing task cards from manufacturer maintenance planning documents. You can also design progressive inspection programs and create technical records to manage unusual or critical incidents.

Planning maintenance programs for aircraft operators

Aviation authorities control the safety and airworthiness of the aircraft that are in their jurisdictions by reviewing and approving operator maintenance programs (OMPs). Aircraft operators use information from maintenance planning documents (MPDs) that aircraft manufacturers provide and other technical documents to define the OMPs that they submit for approval to aviation authorities.

Maintenance planning documents

Maintenance planning documents (MPDs) are provided by aircraft manufacturers to describe the repetitive tasks that are required to maintain their aircraft. Maintenance planning engineers use the MPD information to develop operator maintenance programs (OMPs) that are then submitted to the relevant aviation authority for approval.

Aircraft maintenance includes the tasks that are required to restore or maintain the systems, components, and structures of an aircraft in a safe and airworthy condition. Maintenance is required for regulatory compliance and also to minimize the time that an aircraft is grounded and to maximize the current and future value of the aircraft.

An MPD file from an aircraft manufacturer can contain thousands of line items, one for each recommended maintenance task. In the Maintenance Task Library (MTL) application, you can create an MTL record and then import an MPD file to populate the tasks for the record. When you import an MPD file into an MTL record, each task either adds a task card or updates an existing task card.

The elements of a task are validated during the import. If a task is invalid, an error is reported in the application, and the import process continues. The error report can help you to identify the cause of problems so that you can resolve them.

A task can be invalid, for example, because the skill that is required to perform the task is not defined in your organization. To correct the problem, define a new skill in the Crafts application. You must resolve all errors to successfully complete the import.

After the import is complete, in the MTL application, you can add or delete task cards. You can also modify the attributes of a task card, and the associated zones, access panels, qualifications, related documents, and frequency intervals. When you complete any manual changes to the task cards in the MTL record, change the status of the MTL revision to **Valid**.

You can add any valid MTL records to an OMP and then modify it to satisfy the maintenance policy that is associated with the fleet type and aircraft. You can also align tasks with models, build items, and configuration-managed parts.

After you set the status of an MTL revision to valid, it becomes read-only, but you can create more revisions and manage multiple revisions simultaneously. When you receive an updated MPD file from the aircraft manufacturer, you can import it into a new revision of the MTL record. You then follow the same procedure to import the tasks into the new revision.

Sampling program for aircraft maintenance

Aircraft operators and continuous airworthiness management organizations (CAMO) are required to set up a sampling program for the fleet of aircraft for which they are responsible. Sampling programs validate that maintenance tasks occur at the specified sample threshold and interval frequency that are outlined in the Maintenance Planning Document (MPD) for each aircraft type within a fleet.

In OMPs, you can create and manage a sampling program of maintenance tasks for an aircraft fleet to meet regulatory compliance. Then, in the Master Task Card application, you specify maintenance tasks and set the frequency of the tasks.

In an OMP, you indicate that an aircraft is part of the sampling program. The sample group is made up of approximately 20 percent of the aircraft in the fleet and includes the newest aircraft and oldest aircraft in the fleet. You determine which aircraft in the fleet are the oldest and the newest based on the manufacture date and manually select the aircraft that are in the sampling program.

In the Master Task Card application, you can indicate that there is a sampling requirement and define the sample interval and sample threshold for the maintenance task. When a task card is created or updated from a master task card, then the sample interval and sample threshold is applied to the task card.

Maintenance task library (MTL) records enable you to simultaneously manage multiple revisions of an MPD or OMP. On an MTL record, you can import the sample frequency details for maintenance tasks.

Related concepts:

"Configuring task cards and master task cards" on page 79
Task cards contain detailed information for scheduled maintenance work on aircraft or pieces of equipment. When tasks become due, work orders are generated. Warnings are generated when task cards meet or exceed their warning limit, to prevent the task cards becoming overdue.

Operator maintenance programs

Aircraft operators define operator maintenance programs (OMPs) and associated maintenance checks for each type of aircraft type in their fleet. When the maintenance program is approved by the aviation authority, the OMP is activated and becomes the controlling document for maintenance of that aircraft.

In the Maintenance Task Library (MTL) application, MRO operators can import copies of OMPs that control the maintenance of aircraft that they are servicing for customers. The imported OMPs can be viewed and managed in the OMP application.

Aircraft operators can define and revise OMPs in the OMP application before submission to aviation authorities for approval.

An OMP record is associated with at least one model and is effective, by default, for all aircraft or equipment that are associated with the specified model or models. Maintenance changes to the effective aircraft and equipment are validated against the models to ensure continuing compliance. When an OMP is in draft status, you can remove selected aircraft from the effectivity list.

An OMP typically contains many hundreds of OMP tasks that have associated master task cards. The list of OMP tasks can be compiled from one or more of the following sources:
* Maintenance Task Library (MTL) records that contain task information from maintenance planning documents (MPDs) or other sources
* Master task card records that are maintained in the Master Task Cards application

In an OMP, you can create and manage a sampling program of maintenance tasks for an aircraft fleet. To create a sample group, you indicate an aircraft in your fleet as a sample aircraft. The sample group is approximately 20 percent of the aircraft in the fleet. The sample group contains the oldest aircraft and the newest aircraft in your fleet.

You determine which aircraft in the fleet are the oldest and the newest based on the manufacture date and manually select the aircraft that are in the sampling program. After you indicate that an aircraft is part of the sampling program, you define the sample interval and sample threshold of the maintenance tasks in the Master Task Card application.

In OMPs, maintenance checks group related tasks that occur at the same intervals. In Maximo for Aviation, a check is a type of master task card that you configure in the OMP application. On the **Checks** tab, when you add a check, you add OMP tasks to the check content. Because the check is a master task card, when the OMP tasks are due, work orders are automatically generated and warnings are issued when work is about to become due.

The checks in an OMP are typically organized in a hierarchy, where the first level of checks are the lowest and the fourth level of checks are the highest. You can use a naming convention to distinguish the check hierarchy, for example, A checks are the lowest, then B and C, and D checks are highest. Lower checks are, typically, frequent light checks that can be completed at a line maintenance location. Higher checks are often heavy maintenance tasks that occur less often and require the aircraft to be in a hangar for a number of weeks.

To configure the hierarchy of checks for an OMP, on the **Checks** tab, you configure higher and lower relationships with other checks on the OMP record. For example, if you relate checks A and B, because A is the lower check, when check A runs, check B does not run. When check B runs, check A also runs.

After you define the higher and lower checks, you can create a check loop that breaks down the series of maintenance task requirements into a sequence of related checks. You associate higher and lower checks with the check loop and specify the order of the checks in the sequence. You also specify the frequency at which the maintenance tasks occur in the check loop. When a check loop is completed, it repeats.

Example check configuration

The following table shows example checks:

Table 9. Example checks

Check ID	Frequency in flight hours	Number of master task cards
A1	600	70
A2	1200	28
A3	1800	21
A4	2400	18

The following table shows an example of check loop frequency:

Table 10. Frequency of checks in a check loop

Interval flight hours	Cumulative flight hours	Higher checks	Check content (lower checks)	Number of master task cards
600	600	A1	A1	70
600	1200	A2	A1, A2	98
600	1800	A3	A1, A3	91
600	2400	A4	A1, A2, A4	116
600	3000	A5	A1, A3	91
600	3600	A6	A1, A2, A3	119
600	4200	A7	A1	70
600	4800	A8	A1, A2, A4	116
600	5400	A9	A1, A3	91
600	6000	A10	A1, A2	98
600	6600	A11	A1	70
600	7200	A12 (Sequence repeats from A01)	A1, A2, A3, A4	137

Related concepts:

"Weight and balance management" on page 55
To meet regulatory compliance, you must manage and maintain the weight and balance for all of the aircraft in a fleet. IBM Maximo for Aviation 7.6.3 calculates and monitors changes in the weight and balance of an aircraft based on a predefined formula.

Defining check loops

You can create check loops to break down the requirements of an aircraft check into a sequence of related checks. In an OMP, you can enable check loops to maintain a sequence and manage the frequency of maintenance tasks for an aircraft to meet regulatory maintenance requirements.

Procedure

1. In the Master Task Card application, create a master task card and specify that the record is a check.
2. In the OMP application, create or review an OMP that is in a draft or pending status.

3. Associate the master task card records that are checks with the OMP record.
4. On the **Checks** tab, define the higher and lower checks.
5. On the **Check Loops** tab, specify the name and description of the check loop.
6. Specify the first check and the next checks in the check loop sequence.
7. Specify whether the check loop is an adjustment to update associated records with revisions.
8. Specify flight cycles, flight hours, and the calendar interval and units at which the next check in the sequence occurs.
9. Specify the meter type of the aging interval that occurs between the checks.
10. Save the OMP record.

Maintenance task library

Maintenance task library records contain lists of task card records that are imported from maintenance planning documents (MPDs), operator maintenance programs (OMPs), or other technical documents. MTL records can be used to configure the tasks for OMP records.

MPDs can contain thousands of tasks that are imported as task card records. OMPs can contain hundreds of tasks that are imported as master task card records. During the import, tasks are checked to ensure that all required information is provided in the correct format. Any errors are reported, and you must resolve them to complete the import.

When you create an MTL record, a revision value of 0 is set. When you import tasks from a file, the tasks are associated with this revision. If you receive an updated version of a file, you revise the MTL record to import the new version of the file. The tasks that you import are associated with revision 1. MTL revisions enable you to simultaneously manage multiple revisions of an MPD or OMP.

On an MTL record, you can import the details for the sample threshold and the sample interval frequency for maintenance tasks for the aircraft that are in a sampling program.

Creating an operator maintenance program

An operator maintenance program (OMP) record specifies the models and the related aircraft or equipment that the OMP applies to. OMP tasks represent master task cards that group related tasks. Checks organize groups of OMP tasks that occur at the same interval into a hierarchy of related checks.

Procedure

1. In the Operator Maintenance Program application, create an OMP record.
2. In the **OMP** tab, in the Details section, specify values in the **Operator** and **Authority** fields.
3. In the **Models** tab, add one or more models that the OMP applies to.
4. In the **Effectivity** tab, review the aircraft or pieces of equipment that are associated to the models that you added, and modify the list if necessary.
5. To add a master task card, in the **OMP** tab, in the Master Task Cards section, click **New**, and specify a master task card.
6. Optional: Create a master task card that contains tasks that are imported from a maintenance planning document (MPD).
   a. Select the **Create Master Task Cards from MTL** action.

b. In the **MTL** field, specify an MTL record.

c. Select the task cards that you want to include the OMP task, and click **OK**.

7. In the **Checks** tab, click **New**, and specify a check.

8. To add master task cards to a selected check, in the **Check Contents** subtab, click one of the following buttons:

Option	Description
New	Select one or more OMP tasks from a list to add the associated master task cards.
Select Master Task Card	Use a combination of search terms to filter master task records and select one or more records to add them to the check content.

9. Optional: In the **Related Checks** subtab, add higher and lower checks in the appropriate subtabs. You cannot add the same check to both tabs. A related check can be higher or lower, but not both.

Importing master task cards into the maintenance task library

MTL records contain lists of master task cards that apply to models and associated aircraft or equipment. You import task information from maintenance planning documents (MPDs), from copies of operator maintenance programs (OMPs), or from other technical documents.

About this task

You can import multiple revisions of MPD, OMP, or other technical files into an MTL record. For each file revision that you import, you create a corresponding revision of the MTL record so that you can simultaneously maintain multiple revisions of a single MTL record.

The import of a file is not complete until all lines have been processed, errors are corrected, and the status of the MTL record changes to complete.

Procedure

1. In the Maintenance Task Library application, create a record or create a revision of a selected record.

2. Select the **Import File** action.

3. Click **New File** and browse to the location of the source file that you want to import. After you select a source file, the import process starts automatically.

4. Optional: During processing, click **Refresh** to see how many lines remain to be processed.

5. In the original source file, correct any errors that are reported during the import.

6. In the MTL application, delete the row that links to the file that contained the errors and click **New File** again to import the corrected source file for reprocessing. When all errors are resolved, the record is added to the library.

Validation of MPD data that is imported into an MTL record

When you import MPD data from a file that is provided by a manufacturer into Maximo for Aviation, the data is validated to ensure that it conforms to your configurations. Validation errors are reported so that you can correct any problems.

When you process the data from an imported file, each line part that is imported represents a task card in the MTL record, and is processed in the following manner:

- If a corresponding task card record does not exist, a new task card is created.
- If a corresponding task card record exists, it is updated.
- If a task card record exists that does not have a corresponding line in the import file, the task card remains unchanged.

The following fields in the task card must contain valid values:

- Rev Code
- ATA
- Access
- Zone
- Skill Code
- JC Type
- Phase
- Station

The following fields in the task card must contain numeric values:

- Estimated Access Man Hours
- Estimated Preparation Man Hours
- Estimated Task Man Hours
- Men

The following fields in the task card must contain Yes or No as a value:

- Deferral
- Out of Phase

Weight and balance management

To meet regulatory compliance, you must manage and maintain the weight and balance for all of the aircraft in a fleet. IBM Maximo for Aviation 7.6.3 calculates and monitors changes in the weight and balance of an aircraft based on a predefined formula.

In the *Aircraft Flight Manual*, the center of gravity limits are specified for an aircraft. These limits ensure that the certification stability and control criteria are met during a flight. Maintaining center of gravity specifications allow the accurate trim settings of an aircraft for take-off. Depending on the type of aircraft, you must weigh each aircraft on a periodic basis of one and a half or three years or after any maintenance tasks that alter the weight and balance of the aircraft.

Flight operations use the weight and balance of an aircraft to calculate and define the configuration of operational dependencies, such as fuel load distribution, cargo and passenger distribution, and military aircraft weapons systems. In the Models application, you define the units of measurement that are used to measure the weight and balance of all aircraft that are associated with the model. You must define the units of measurement for the weight, arm, and moment of the aircraft and the percentage of variance for weight and balance measurements.

In the Aircraft application, you track and monitor the weight and balance measurements of an aircraft. In the Master Task Card application, you monitor the

maintenance tasks that affect the weight and balance of an aircraft. You associate the details that are outlined in master task cards to task cards, job cards, work orders, and work packages.

Maintenance tasks can affect the weight and balance of an aircraft. In the Work Order Tracking application, you can track these changes. After the completion of a maintenance task that affects the weight and balance of the aircraft, you update the work order by specifying the change in weight and the associated moment. The revised weight and balance of the aircraft is automatically recalculated and validated based on the change in weight and its position. These updates to the weight and balance are made in any records that are associated with the aircraft, including records that are in the Aircraft application and Flight Log Book application.

Managing regulatory requirements with progressive inspection programs

A progressive inspection program (PIP), which is also known as fixed-frequency maintenance, involves creating a maintenance program that is based on a fixed schedule. The schedule can be based on regulatory requirements.

Defining progressive inspection programs

A progressive inspection program (PIP) is defined by the creation of a group of master task card records that are linked together and are based on a fixed frequency, such as an interval of 50 flight hours. The PIP is a cycle that repeats after the last master task card record is completed.

About this task

A PIP is typically used to divide a large inspection into several smaller pieces of work. For example, an annual inspection might require you to ground an aircraft for two weeks to complete all of the work. Instead of performing the annual inspection once a year, you can divide the inspection into six phases, each of which is due after 300 hours.

When a master task card record is created in a PIP group, any associated task card records automatically inherit the settings for the PIP. If your maintenance program applies only to a single aircraft, you can define your PIP in task card records instead of in master task card records. The process of defining a PIP in task card records is the same as defining a PIP in master task card records.

You can define a PIP for meter-based frequencies and configuration-managed aircraft or equipment only.

Procedure

1. In the Master Task Cards application, create a master task card record.
2. Specify the fields that are required for the master task card record.
3. In the PIP Information section, select the **Fixed Frequency** check box.
4. Specify a name for the PIP group.
5. Specify the sequence number.
6. Click the **Frequency** tab, and on the **Meter Based Frequency** tab, specify the frequency, alert, and warning details. The frequency units value for each task

card in the PIP sequence must be the same. For example, you can specify a frequency of 50 flight hours, an alert at 48 flight hours, and a warning at 45 flight hours.

7. Optional: On the **Sequence** tab, specify the job plan that is used for completing the tasks for this phase of the PIP. Assigning a job card to each master task card in a PIP ensures that the work is divided throughout the inspection program.

8. Create as many master task card records as your PIP requires. For example, if your PIP consists of six phases, you create five duplicate master task card records.

   a. Select the **Duplicate Master Task Card** action. The PIP information is copied, and the PIP sequence number is automatically updated with the next number in the sequence. The frequency information on the **Meter Based Frequency** tab is the copied.

   b. Optional: On the **Sequence** tab, change the job card.

9. Link each master task card record in the PIP group to the next master task card record in the sequence.

   a. Open a master task card in the PIP group.

   b. In the master task card Actions section, add a deactivate action. Set the secondary master task card record to the identification number of the current master task card. When the associated work order is completed, the master task card record is deactivated. This deactivation completes this phase of the PIP.

   c. In the master task card Actions section, add an activate action. Set the secondary master task card record to the identification number of the next master task card record in the PIP sequence. When the associated work order is completed and the original master task card record is deactivated, the next master task card record in the PIP group is activated. This activation moves the PIP to the next phase of inspection.

10. Save the record.

Progressive inspection programs

In a progressive inspection program (PIP), aircraft maintenance is divided into phases and occurs at fixed intervals. For example, an aircraft requires a maintenance inspection is completed every 300 hours. Instead of completing the entire inspection at 300 hours, the tasks are divided into six inspections that are completed consecutively at intervals of 50 flight hours.

You create a master task card for each phase of your PIP. The master task card records are collectively known as your PIP group and share a PIP group name. The PIP sequence number identifies the order in which the master task card records are completed. For each master task card record, you specify the frequency at which the inspection occurs, such as every 50 flight hours. After you create a master task card record, you can specify a job card to define the tasks that are created during the phase of the PIP.

After you create all the master task card records for your PIP, you link the records together with activation and deactivation actions. These actions ensure that only one master task card record is active at a time. After the work orders that are associated with a master task card record are completed, fixed frequency count for the master task card is increased by one, and the next master task card record in the sequence is activated. This process continues until the last master task card record, and the PIP starts over with the first master task card record.

Defining the PIP in master task card records is an efficient method of developing the maintenance program. However, if your maintenance program applies only to a single aircraft, you can define your PIP in task card records instead. The process of defining a PIP in task card records is the same as defining a PIP in master task card records.

When you create a PIP for a new aircraft or a new inspection process, you are able to start the PIP with the first master task card record in the PIP group. However, you might add a PIP that is already in progress. For example, you divide a maintenance inspection into a PIP that consists of six inspections that are completed every 50 hours. The first two phases of the inspection are already completed before you add the aircraft and the PIP to the system. You must define the entire PIP and then set the fixed frequency counters for the first two master task card records to 1 to indicate that those phases of the PIP are already complete.

Resetting initial PIP due counts

The initial PIP due count is used to determine when the first maintenance event is due. Subsequent maintenance events for the same task card record are then offset by the initial PIP due count. You might need to reset the initial PIP due count at any point during the aircraft lifecycle.

About this task

Only one task card record can be active in a PIP at any time.

Procedure

1. In the **List** tab of the Aircraft and Equipment applications, select the aircraft or equipment whose initial PIP due count you want to change.
2. Click the **Maintenance Plan** tab and select the **Set Initial PIP Due Count** icon, which is located next to the PIP group in the table row.
3. Specify the new initial PIP due count.
4. Save the record.

Results

The initial PIP due count is changed, which changes the task card record that is next due. For example, if you set the initial PIP due count to 2, the next task card record that is due is the 3rd record in the sequence.

Resetting fixed frequency counters

When a task card record in a PIP cycle is reset because the associated work order is complete, the next due point is always the point that is specified by the PIP sequence. However, you might need to reset the PIP sequence by using the **Set Fixed Frequency Counter** action in the associated PM record.

Before you begin

By default, the **Set Fixed Frequency Counter** action is not available. You must enable the action in the Security Groups application.

About this task

Only one task card record can be active in a PIP at any time.

Procedure

1. In the **List** tab of the Aircraft and Equipment applications, select the aircraft or equipment whose PIP you want to change.

2. In the **Maintenance Plan** tab, open the associated task card record.

3. Select the **Set Fixed Frequency Counter** action and specify the new fixed frequency count. For example, you define a PIP that is already in its third phase. You must increase the fixed frequency counters for the first two task card records by 1 to indicate that the records were completed.

4. Save the record.

Results

On the task card record, the **Fixed Frequency Count** field indicates the number of times that the work orders associated with the master task card are completed.

Creating technical publications

Technical publications generate critical time-dependent maintenance or design change tasks that typically apply to an entire fleet. Technical publications can affect aircraft configurations, maintenance plans, and other reference data for a specific set of aircraft or equipment in one or more models.

Technical publications

Technical publications contain information, such as airworthiness directives or customer service notices, from vendors, manufacturers, and regulatory agencies. Technical publications can trigger maintenance events and affect work planning forecasts.

The Technical Publications application stores technical publications from manufacturers, vendors, regulatory agencies, and others. Technical publications can have complex criteria to define which aircraft they affect. The Technical Publications application tracks the following information:

- Identifying details
- Affected aircraft
- Maintenance plans, which include task cards and job cards for implementing work requirements
- Status or method of compliance of each affected aircraft
- Related technical publications

When you create a technical publication, you can specify whether an upgrade is applied to multiple aircraft. Typically, software items are updated in this manner. You can upgrade all the software within the top-level aircraft at the same time, including the child aircraft that are in build positions that are defined on the technical publication.

Multiple maintenance plans, each with an associated job card, can be created for a technical publication. Each maintenance plan is used to create a task card for each affected aircraft. The task cards are used to create work orders to implement the requirements of the technical publication. When you specify a maintenance plan for a technical publication, you can optionally select to automatically complete all associated maintenance plans. By using this option, when any individual work order is completed, all task cards that are generated from the technical publication for a particular aircraft are automatically completed. If you choose not to

automatically complete all associated maintenance plans, you avoid deactivating associated maintenance plans, and each task card work order must be completed individually. You can also select to complete all associated maintenance plans before the method of compliance is reported for each of the associated aircraft.

When you specify a maintenance plan for a technical publication, you can define a range of frequency iterations so that regulatory compliance is maintained. A frequency iteration defines how many times inspections are completed to comply with the requirements of the technical publication.

On the **Maintenance Plan** tab, you can define and view frequency iterations by clicking **Frequency Iterations**. When you create a frequency iteration, you can specify whether the task card is deactivated when the last frequency iteration is completed. You can change whether the task card is deactivated only during the last frequency iteration. If you add iterations during the last iteration, the check box for deactivated the task cards after the last frequency iteration is set to read-only.

A frequency iteration can be time-based or meter-based. You have flexibility in defining a frequency iteration, and iterations can occur at different intervals. For example, you can define a frequency iteration that consists of three meter-based iterations: the first inspection occurs every 10,000 miles for two iterations. The second inspection occurs at 25,000 miles for three iterations, and the third inspection occurs at every 50,000 miles. You can also define alert and warning intervals for each frequency iteration.
- The first and second inspections occurs after 10,000 miles each
- The third inspections occur after 25,000 miles

Technical publications include the following types of records from manufacturers, vendors, and regulatory agencies:
- Airworthiness directives
- Configuration rule-change documentation
- Customer service notices
- Engineering and design publications
- Fleet-level and component-level projects

Technical publications are managed at the part set level because technical records are associated with models and configuration-managed parts. When you create a technical publication, you can specify an organization and a site to further limit the applicability of the technical record. For example, you can opt not to specify the site and organization so that the technical record applies to the entire part set. If if the technical publication applies only to the aircraft that are stored at a single site, you can specify that site so that the technical publication has limited applicability.

You can add a terminating action to a technical publication. A terminating action defines a condition that is required in order for a recurring inspection to be terminated, for example, a certain level of physical wear is recorded. Terminating actions are useful because not every requirement in a technical publication can be reduced to a series of programmable statements. Terminating records ensure compliance with the requirements of the technical record.

You can track design changes and requirements by relating technical records. A related technical publication can provide information, define a relationship that requires action when maintenance events occur, or define a relationship to a

modification record. Relating a technical record to a modification record creates a complete record of the engineering design standard.

Enterprises typically must maintain and report the status of their technical publications to external regulatory agencies.

Examples of using technical publications

The records department of your enterprise receives a new bulletin, directive, notice, or other type of publication. This publication might come from a manufacturer, vendor, regulatory body, or another authorized department in the enterprise. You create a technical publication to document the new information and attach any supporting electronic documentation. You establish criteria to identify the aircraft that are affected by the technical publication. Criteria can include position, part number, serial number range, models, or configurations of models. You can create initial task cards, job cards, and possibly follow-up task cards that establish work requirements. You can also enter task card actions to define the interaction among task cards. Other technical records might deactivate the task cards.

If your records department receives a new bulletin, directive, notice, or other publication that supersedes an existing technical publication. You define the superseding technical record. Then, you open the superseded technical record and change it to point to the superseding technical publication. The status of the superseded technical publication is changed from Active to Superseded.

Your enterprise receives a new aircraft and decides that it is a configuration-managed aircraft. You create an aircraft record for it and designate it as configuration-managed. The build data interpreter identifies the technical publications that the new aircraft must comply with task cards and any work orders that are necessary to initiate the compliance process are generated for any technical publications that the new aircraft must comply with.

A regulatory body or an internal audit department notifies your enterprise that it plans to investigate the incorporation status of one or more technical publications. You create a report to identify the compliance of aircraft that are associated with the applicable technical publications.

Technical publication statuses
A technical publication can have a status of Draft, Active, Inactive, or Superseded.

Table 11. Technical publication statuses

Status	Description	Updates	Deletion	Status changes
Draft	The technical publication is incomplete.	Can only update fields in the Details section.	Allowed	Can change to Active
Active	The technical publication is complete. Associated task cards, schedules, and work orders are generated and tracked.	Can only update fields in the Superseded By section of the **Technical Publication** tab.	Not allowed	Can change to Inactive

Table 11. Technical publication statuses (continued)

Status	Description	Updates	Deletion	Status changes
Inactive	The technical publication is not complete and is not tracked.	Cannot be updated.	Allowed	Can change to Active.
Superseded	Another technical publication replaced the original record. The original technical publication is obsolete.	Can only update the **Superseding Publication** and **Supersedence Date** fields on the **Technical Publication** tab.	Allowed	Cannot change a status to Superseded manually. The status is changed to Superseded automatically when you supersede a record on the **Technical Publication** tab.

Creating technical publications

A technical publication identifies and tracks the technical specifications, affected equipment, work requirements, and related task cards.

Procedure

1. In the Technical Publications application, click the **New Technical Publication** icon.
2. If the **Publication** field is empty, enter a value.
3. Enter a description in the **Title** field.
4. If the part number of multiple equipment records are to be updated when work is completed, select the **Apply Multiple Upgrades** check box.
5. Optional: To limit the applicability of the technical publication, specify an organization or site.
6. Specify values for the **Type** field and the **Required By** field.
7. Enter the date when the technical record takes effect.
8. In the **Revision**, **Chapter**, **Paragraph**, and **Part** fields, enter values that correspond to the original document. The combination of these values must be unique to this technical publication.
9. Optional: In the **Narrative** field, enter the details for the technical record. For example, you can add the following details to the field:
   - Objectives of the technical publication
   - Requirements
   - Equipment selection criteria
   - Effective date
   - Conditions when corrective action is necessary
   - Details of the work that is necessary
   - Termination conditions
10. If you use maintenance plans, on the Maintenance Plans tab, specify completion details:

Option	Description
To complete all task cards when the technical publication is complete	Select the **Complete Associated Maintenance Plans** checkbox.
To complete all maintenance plans before the method of compliance is reported	Select the **Complete All Maintenance Plans Before Method of Compliance** checkbox.

11. Save the technical publication.

Adding affected models and serial numbers

Because technical publications can require corrective action, you can identify models and serial numbers affected by a technical record, if the status of the technical publication is Draft. The build data interpreter (BDI) uses the model and serial number criteria to identify affected aircraft or equipment.

Procedure

1. In the Technical Publications application, select the technical publication for which you want to identify affected models.
2. On the **Models** tab, click **Auto Create**.
3. Optional: To change the serial range in an existing row, update the **Serial Range Expression** field.
4. Optional: To add another model or serial range expression, duplicate the row.
5. Optional: Delete any unnecessary rows.
6. Save the technical publication.

Adding affected build items

Because technical publications can require corrective action, you can add build items that are affected by a technical publication. The build data interpreter (BDI) uses the build item criteria to identify affected aircraft or equipment that are associated with the build item. If the status of the technical publication is Draft, you can add the build item criteria.

Procedure

1. In the Technical Publications application, select the technical publication for which you want to identify affected build items.
2. On the **Build Items** tab, add a new row and enter a position name.
3. Optional: In the **Operative Date** field, enter the date when tracking of the build item begins.
4. Optional: In the **Mandatory Date** field, enter the date when tracking of the build item must begin. You can extend the mandatory date by entering the number of days deferred in the **Auto Deferral** field.
5. Optional: In the **Inoperative Date** field, enter the date when the build position becomes inoperative.
6. Save the technical publication.

Adding affected build positions

Because technical publications can require corrective action, you can identify the build positions that are affected by a technical publication. Build positions identify a model, configuration, build position, and part. The build data interpreter (BDI) uses the build position criteria to identify affected aircraft or equipment.

Before you begin

The **Build Positions** tab displays build positions associated with the criteria that you identified on the **Parts** tab or **Build Items** tab. Before you identify build positions, save updates to the **Parts** or **Build Items** tab.

Procedure

1. In the Technical Publications application, select the technical record for which you want to identify affected build positions.
2. On the **Build Positions** tab, add new rows or click **Auto Create** to automatically create rows based on the data on the **Parts** tab or **Build Items** tab.
3. Optional: Update the values in the existing rows.
4. Optional: Add model or serial range expression.
5. Optional: Delete any unnecessary rows.
6. Save the technical publication.

Adding affected parts

Because technical publications can require corrective action, you can add configuration-managed parts that are affected by a technical publication if the status of the technical record is Draft. For example, you can add a part that must be removed from aircraft or equipment because of the technical publication. The build data interpreter (BDI) uses the part criteria to identify affected aircraft or equipment that are associated with the parts.

Procedure

1. In the Technical Publications application, select the technical record for which you want to identify affected parts.
2. On the **CM Parts** tab, add a new row and enter the part.
3. Optional: In the **Serial Range Expression** field, enter one or more serial numbers or ranges of serial numbers.
4. Optional: In the **Inoperative Date** field, enter the date that the part becomes inactive.
5. Optional: To supersede the part, specify the superseding part number.
6. Optional: In the **Operative Date** field, enter the date when the superseding part becomes effective.
7. If you plan to rework a superseded part to create the superseding part and you want to update affected aircraft or equipment to point to the superseding part, select the **Upgrade** check box.
8. Save the technical publication.

Creating associated task card records

A task card can be associated with an active technical publication. A cron task constantly checks for readiness to create task card records. You can also generate task cards immediately to schedule the work that a technical publication requires.

Procedure

1. In the Technical Publications application, select the technical record for which you want to create associated PMs.
2. Select the **Create Associated Task Cards** to view the affected aircraft or pieces of equipment for which you have not created an associated task card.

3. Select the aircraft or pieces of equipment for which you want to create associated task cards.
4. Click **OK** to generate associated task cards for the selected aircraft or pieces of equipment.

Superseding technical publications

You supersede a technical publication when a newer technical record renders it obsolete. After you define the new technical publication, you update the original record with information about the new record. The status of both technical publications must be Active.

Procedure

1. In the Technical Publications application, create a technical publication for the superseding publication.
2. Change the status of the technical publication to Active.
3. On the **Technical Publication** tab, select the older technical publication.
4. In the Superseded By table, enter the supersedence date.
5. In the **Publication** field, specify the identifier of the superseding technical publication that you created.
6. Save the technical publication. The status of the original technical publication is changed to Superseded. A relationship of type SUPER is created between the superseded and superseding technical records. Any associated PMs without work orders are removed.

Removing references to superseding technical publications

When you want to reactivate a superseded technical publication, you remove the reference to the superseding technical publication. Removing the reference does not delete the superseding technical publication.

Procedure

1. In the Technical Publications application, select the superseded technical record.
2. In the Superseded By table, clear the **Publication** field.
3. Save the technical publication. The record is saved with a status of Active.

Specifying maintenance plan requirements

Maintenance plans are used to correct issues identified by technical publications. Maintenance plans can be date-based, meter-based, or maintenance-event-based. A maintenance plan can generate multiple task card records or can indicate limitation on aircraft or equipment based on usage criteria. For example, an aircraft or piece of equipment with fewer than 500 hours can require maintenance within 200 hours.

Procedure

1. In the Technical Publications application, display the technical publication for which you want to enter maintenance requirements.
2. On the Maintenance Plan tab, add a new row.
3. To enter date-based criteria, enter dates for when the work requirements are tracked and when the work requirements must be completed.
4. To enter meter-based criteria, enter a meter name and do one or more of the following:
   - To specify that maintenance is required within a specific number of flight hours, engine cycles, or engine starts, enter the number in the **Count** field.

- To specify that maintenance is required by the time that the selected meter reading reaches a specific reading, enter the value in the **Count** field and select the **Due at Count** check box.
- To specify that maintenance is required only on aircraft or equipment with a meter reading greater than a specific value, enter the value+1 in the **From Count** field. .
- To specify that maintenance is required when the meter reading falls between two values, enter the values in the **From Count** field and the **To Count** field.

5. To enter maintenance-event-based criteria, do one or more of the following:
   - To perform the required maintenance for a scheduled task card, enter the task card number in the **Due Master Task Card** field.
   - To perform an inspection within a specific number of days and then a certain number of days after that, create two records. In the first record, select the **Initial** check box. In the second record, select the **Repetitive** check box.

6. To enter aircraft or equipment limitations, enter a value in the **Limit Meter** field.
   - In the **From Count** field, enter the minimum meter reading to which the date-based, meter-based, or maintenance-event-based criteria apply.
   - In the **To Count** field, enter the maximum meter reading to which the date-based, meter-based, or maintenance-event-based criteria apply.

7. Save the record.

Specifying methods of compliance

Many highly regulated industries require the tracking and compliance of technical publications. You can specify the method of compliance (MOC) for an aircraft or piece of equipment that does not require maintenance.

Procedure

1. In the Technical Publications application, display the technical record that you want to update.
2. On the **Aircraft or Equipment Status** tab, select the aircraft or piece of equipment for which you want to add the MOC.
3. In the **MOC** field, enter the method of compliance.
4. Save the technical publication.

Chapter 6. Maintenance planning and management

Planning the maintenance of an aircraft involves monitoring aircraft or equipment conditions to determine when work is due in the short, medium, and long term. Decisions in maintenance planning are based on the availability of tools, labor, and repair locations. Efficiencies are achieved by scheduling work to make maximum use of resources when maintenance is required.

Planning maintenance locations

Planning and scheduling maintenance activities for aircraft or equipment can be complex, because often the aircraft or equipment that requires maintenance is not in the correct location at the correct time. Maintenance location planning involves managing and scheduling assignments, crews, and materials at MRO locations.

Related concepts:

"MRO locations application" on page 229
An MRO location represents the physical location of a facility where the maintenance, repair, and overhaul of complex aircraft or equipment occur. The MRO Locations application is used to schedule work packages efficiently and to define the physical location, classification, and capabilities of the site where the MRO activities occur.

MRO locations overview

An MRO location represents the physical location of a facility where the maintenance, repair, and overhaul of complex aircraft or equipment occur. The MRO Locations application is used to schedule work packages efficiently and to define the physical location, classification, and capabilities of the site where the MRO activities occur.

The MRO Locations application is used by maintenance managers, planners, and schedulers to define MRO locations, such as bays, within an MRO location. Maintenance activities are allocated to the most suitable MRO location to maximize productivity.

An organization can have multiple MRO locations within a facility. You must create and specify an MRO location before you can schedule maintenance activities for that location. You can associate classifications, such as floor type or dimensions, with the MRO location.

A capability is a specialized task, such as EASA-certified repair, that an MRO location can perform. Capabilities can be added to an existing MRO location by using the MRO Location Capabilities table on the main tab. The capabilities of an MRO location might include, for example, approved certification procedures from the FAA and EASA.

You can define the physical relationships, such as being adjacent, between MRO locations to allocate different aircraft types to a combination of MRO locations. For example, you can combine MRO locations to accommodate a large aircraft.

A work package is a set of work that has a scheduled start and finish date. A work package can be related to only one MRO location. You assign work packages to an MRO location, which includes a scheduled start and finish date for the maintenance.

Managing location assignments

In the Graphical Assignments - MRO Location application, you can assign work directly to your facilities based on their availability. For example, you can assign work directly to an aircraft hangar.

In the Assignment view, you review a list of all the facilities within a location. You can review when they are available for work and plan accordingly.

On the **Work List** tab, you can create a list of scheduled work orders and the available labor and crews for your MRO location.

The Gantt view consists of two tabs. On the **Assignment View** tab, you can review unassigned work and the facilities available to do the work. You can review current assignments in your MRO locations and balance the workload. On the **Work View** tab, you can review work details, such as aircraft or equipment and priority. You can also modify work details, such as status, work priority, and target start and end dates.

All assignment information can be saved to the associated work records.

MRO locations

An MRO location is a facility where aircraft are brought for maintenance. You can assign work to resources that are associated with the MRO location, or to the MRO location itself.

An MRO location can take many forms, including automotive bays, aircraft hangars, and workshops. Planning for these facilities is done for short time periods when work emerges or becomes due simultaneously. For example, you might schedule work for an MRO location for two weeks in advance.

Creating work lists

You can create a list of upcoming work that needs to be assigned, and assign it to MRO locations based on their availability. Work lists can be updated or deleted only by the user who created them. Use the Manage Commit Access action to control who can commit the work list back to the database.

Procedure

1. In the Graphical Assignment - MRO Location application, on the **Work List** tab, create a new work list.
2. Enter a name for the work list and specify calendar and shift information for when the work is to be performed.
3. Specify a MRO location.
4. Create a query based on the work records that you want to include in your work list. Resources that are required to complete the work are included in the Assignment view. Facilities that match your MRO location are listed.

Assigning work to MRO locations

You use the Assignment view to assign upcoming work to MRO locations based on their availability.

About this task

The Assignment view displays the availability of your MRO locations. Unavailable time appears in the Gantt view as a shaded area on the resource table.

Procedure

1. On the **Assignment View** tab, select the work record that you want to assign. An orange bar represents unassigned work. You can assign work by using one of the following methods:

   • Drag the work record to the resource that you want to assign it to in the resource chart.

   • Right-click on the bar representing the work that you want to assign. Select **Available Location**. In the **Available Location** window, select the labor or crew resource that you want to assign the work to. Click **OK**.

   When work is properly assigned, the bar that represents the assigned work is green. If you selected a resource that does not match the work requirements, the bar is red. If an appointment is required (in the work record application), an icon indicates that an appointment has not been made. Right-click on the assignment and choose **Lock** to set the appointment. Appointments that are locked cannot be rescheduled due to optimization or manual edits. To change the scheduled time manually, right-click on it and choose **Unlock**.

2. Save the work list.

Managing assignments

You assign work to labor and crews at your facility based on their skills and availability. In the Graphical Assignment application, you view upcoming work and assign the work graphically to the appropriate labor or crew resource, and respond to dynamic work situations.

On the **Work List** tab, you can create a list of scheduled work orders and the available labor and crews, and apply a street level route.

The Gantt view consists of two tabs. On the **Assignment View** tab, you can review unassigned work and the resources that are available to do the work. You see the daily availability of your crews and technicians, including shifts and breaks, and exceptions such as sick leave and vacation time. You can access resource details, such as skill, rate, and certifications. You can also see current assignments and balance the workload. You can reassign work, or split work between resources or across shifts. In the **Work View** tab, you can see work details, such as aircraft or equipment and priority. You can also modify work details, such as status, work priority, and target start and end dates.

In the **Dispatch** view, you can see work and work routes in maps and calendars. These tools also provide a graphical view of the requirements, availability, and work assignments of labor and crews. You can use these tools to view detailed information about labor and crews to monitor their work progress more precisely in the short term, such as during a work shift.

In the **Dispatch** view, you can do the following tasks to respond more effectively to dynamic work situations:

• Sequence and assign work to labor and crews based on the priority, status, and locations of work orders

• Determine travel time between work orders

- Locate labor and crews using their mobile devices or global positioning system (GPS)

All assignment information can be saved to the associated work records.

Creating work lists

You can create a list of upcoming work that needs to be assigned, and assign it to labor and crews based on their skills and availability. Work lists can be updated or deleted only by the user who created them. Use the Manage Commit Access action to control who can commit the work list back to the database.

Procedure

1. In the Graphical Assignments application, in the **Work List** tab, create a new work list.
2. Enter a name for the work list and specify calendar and shift information for when the work is to be performed.
3. Specify a facility, if applicable.
4. Create a query based on the work records that you want to include in your work list. Resources that are required to complete the work are included in the Assignment view. The labor and crew resources that meet the criteria you specified populate the Assignment view. You can also create a work list based on an existing schedule in the Scheduler application. From the **Select Action** menu, select Create Work List from Schedule, and then select the schedule in the **Select Schedule Project** window.
5. Apply the street-level route, if applicable, and save the work list.

Assigning work

You use the Assignment view to assign upcoming work to labor and crews based on their availability.

About this task

Assignments typically originate from a job card, but can be added to work records at any time. Job cards specify the crafts and crew types that are required to do the work.

The Assignment view displays labor and crew availability as it is defined in the Calendars application, where you can define calendar, shift, and break information. Non-work time appears in the Assignment view as a shaded area on the resource table. The Assignment view also shows the modified availability of the resources, including overtime, sick, and vacation time.

Procedure

1. On the **Assignment View** tab, select the orange bar representing the work record that you want to assign. You can shift-click to select multiple records. Resources that match the requirements of the work exactly (both craft and skill) are shaded dark blue. Resources that partially match the requirements (craft only) are shaded light blue. A multiple skills icon indicates that the labor or crew possesses multiple skills. You can right-click on the resource and select **View Craft/Skill** to see all of its associated skills. You can assign work by using one of the following methods:
   - Drag the work record to the resource that you want to assign it to in the resource chart.

- Right-click on the bar representing the work that you want to assign. Select **Available Labor**. In the **Available Labor** window, select the labor or crew resource that you want to assign the work to. Click **OK**.
- Right-click on the resource that you want to assign the work to. Select **Assign Available Labor/Crew**. The work is assigned to the selected resource based on their availability. It is split to accommodate shifts, etc.

When work is properly assigned, the bar that represents the assigned work is green. If you selected a resource that does not match the work requirements, the bar is red. If an appointment is required (in the work record application), an icon indicates that an appointment has not been made. Right-click on the assignment and choose **Lock** to set the appointment. Appointments that are locked cannot be rescheduled due to optimization or manual edits. To change the scheduled time manually, right-click on it and choose **Unlock**. Using keyboard keys, you can restrict where you can drag assignments. Click **Shift** while dragging to move tasks up and down on the Gantt view, locking the time. Click **Alt** while dragging to move tasks left to right, locking the labor, craft, or crew assignment.

2. Save the work list.

Splitting work between people and shifts

You can split work into multiple assignments to complete the work as efficiently as possible. For example, if a job takes more time than anticipated, you can continue it into a second shift with another labor or crew resource.

Procedure

1. In the resource chart of the Assignment view, right-click on the work record that you want to split.
2. Split the work by either segment or shift. For example, if the work duration spans more than one work shift, you can split the work by shift. If you want to break the work up into smaller segments that can be assigned simultaneously, split the work into two or three segments.
3. Assign each segment of the work.
   - Drag the work to the appropriate labor or crew resource.
   - Right-click on the bar representing the work that you want to assign. Select **Available Labor**. In the **Available Labor** window, select the labor or crew resource that you want to assign the work to. Click **OK**.
4. Save the record. To merge the assignments in the future, right-click on any segment of the assignment and select **Merge Split Assignments**.

Rescheduling assignments

In reviewing the weekly schedule for the organization, a maintenance planner sees that some work must be reassigned because of upcoming emergency work. The maintenance planner wants to leave a particular labor or crew resource available for the upcoming work.

Procedure

1. In the Graphical Assignments application, click the **Assignment View** tab. In the resource table, locate the labor or crew entry to make available for emergency work.
2. Drag the assignments that you want to reassign to another labor or crew resource. You can also reassign all the work assigned to a resource to a different day by selecting multiple records (Ctrl-click) and dragging them to a different day.

3. Save the record.

Assigning emergency work

You can check for emergency work in your organization and assign the work as it comes in. You can assign the work to available resources automatically or manually.

Procedure

1. In the Graphical Assignment application, from the Action menu, choose **Define Emergency Work**.
2. Enter a SQL WHERE clause to query for incoming work that qualifies as emergency work. Select **Assign Automatically** to assign the work to available resources automatically. Clear the **Assign Automatically** check box to choose from a list of available labor resources and assign the work yourself.
3. Select the frequency with which you want the query to run.
4. Click **Submit** to run the query immediately. Click **Save** to run it at the scheduled time.

Results

You can preview emergency work that matches your query in the Emergency Work Orders table window. You can see any assignments that were made.

If you chose not to automatically assign work, the Emergency Work Resource Availability window opens. From the list, select the resource that you want to assign the work to. For queries set to run in the future, email notifications are sent. You can also see a list of new emergency work by clicking **View Available Resources for Emergency Work Orders** on the Scheduler toolbar.

Whenever emergency work is added to a work list, travel time is recalculated by your map service provider.

Dispatching work to crews and labor

You dispatch work to assign resources, such as labor resources or equipment, to work orders. After you configure queries to define street-level routes, you dispatch labors and crews to unplanned work, such as when a labor is sick or for emergency work orders.

About this task

Work is planned several weeks ahead of time in the Graphical Scheduling application. Work is planned by coordinating new and unassigned work orders with the available resources, which can be individual labor resources or crews and their tools. Any shift breaks for crews are entered in the Calendar application.

Dispatching is required closer to the time of the scheduled work, when the dispatcher must manage unplanned scheduling issues. For example, an electrician is not available today due to illness. All of the work that is assigned to the electrician needs to be reassigned to another labor resource for the work to be completed today. Or an emergency work order needs to be completed within the next two hours.

The dispatcher needs to find a labor resource to replace the sick labor resource, create a route for the new labor resource, and then delete the street-level route of the sick labor resource. Then, the emergency work order must be located on a map

to find a nearby crew or labor resource to do the unplanned work. The street-level route for the crew needs to be redrawn to include the emergency work order.

Preparing to dispatch labor and crews:

Before you dispatch labor or crews, you must create a list of scheduled work orders and apply a street-level route before dispatching labor and crew resources.

Procedure
1. In the Graphical Assignment application, on the **Work List** tab, complete the fields to create a work list.
2. Define a work query in the SQL Expression Builder to retrieve the relevant work and labor or crew records.

   For example, create the following query to find all open work orders that are scheduled for the next week:

Option	Description

DB2	`((woclass = 'WORKORDER' or woclass = 'ACTIVITY')`
	`and historyflag = 0 and schedstart >= CURRENT_TIMESTAMP`
	`and schedstart <= (CURRENT_TIMESTAMP + 7 DAYS)`
	`and (status !='COMP'))`

Microsoft SQL Server	`((woclass = 'WORKORDER' or woclass = 'ACTIVITY')`
	` and historyflag = 0 and schedstart >= GetDate()`
	` and schedstart <= GetDate()+7 and (status !='COMP'))`

Oracle Database	`((woclass = 'WORKORDER' or woclass = 'ACTIVITY')`
	`and historyflag = 0 and schedstart >= sysdate`
	`and schedstart <= sysdate+7 and (status !='COMP'))`

3. Filter by resources, such as labor and crews.
4. Apply the street-level route.

Responding to labor and crew unavailability:

You must be able to reassign work from absent labor and crew resources to other labor and crews so that work is completed on schedule. You must also update the street-level routes provided to the replacement labor and crews.

Procedure
1. In the Graphical Assignment application, on the **Dispatch View** tab, view the work orders of the absent labor or crew resource on a map and on a calendar.
2. Click each work order on the map to view the work order details. Check which labor or crews can complete the work orders based on their location and skills.
3. Reassign the work to the most suitable labor or crews resource.
   - If a single labor or crew resource cannot complete all the work orders, then you must divide the work between several labor and crew resources. Assign each work order to the most suitable labor or crew resource.
   - If you can find one replacement to reassign all the work for that labor resource, you must create a street level route. Select the **Apply Street Level Routes** action, and specify the date of the work, the start and end location, and the labor or crews record.

   The map is refreshed to include the street-level route for the replacement labor or crew resources.

4. Delete the street-level route for the absent labor or crew resource. From the Action menu, select **Delete Street Level Routes**, and specify the date of the absence, the labor record, and the start and end location for the work.

Responding to emergency work:

A dispatcher assigns labor and crews to emergency work. After the work order is created, the dispatcher views the location of the emergency work on a map and finds nearby labor or crews to it. Then street-level route is updated to include the emergency work.

Before you begin

The emergency work order is created in the Work Order Tracking application.

Procedure
1. In the Graphical Assignment application, on the map on the **Dispatching** tab, select the icons to view the unassigned work orders and nearby labor and crews.
2. In the calendar, ensure that a nearby labor and crew resource has the availability and required skills for the work order.
3. On the map, select the work order and assign it to the labor or crew resource. The street-level route for the crew is updated.

Geolocation of labor and crews:

Geolocation uses various types of signals, such as the signal used by a mobile phone, to approximate the location of a user. You can enable the geolocation of labor and crews so that you can view maps to monitor their work and route progress.

Geolocation is enabled for labor and crews that have mobile devices access to Maximo Everyplace®. For mobile devices that do not have access to Maximo Everyplace, you can enable geolocation by integrating the mobile devices with the LBSLOCATION table.

The following table describes the map geolocation symbols that might be associated with the labor and crews.

Table 12. Geolocation symbols

Symbol	Description
	Indicates that the location data was refreshed was less than an hour ago. You can change the interval time between date refreshes in the `mxe.lbs.lastupdate.tolerance` system property.
	Indicates that the location data was refreshed was over an hour ago.
	Indicates that the location of the labor or crews is estimated to be outside of the defined radius. You can change the radius in the `mxe.lbs.maximumAccuracy` system property.
	Indicates the accuracy of the geolocation of the labor and crews. The smaller the radius, the more accurate the geolocation. If the accuracy is less than 2000 meters, then the image is not displayed.

Street level route cron task:

The street level route cron task is scheduled to run daily on the system server. Cron tasks are behind-the-scene jobs that run automatically and on a fixed schedule.

The SLROUTECLEANUP cron task deletes street level routes that were scheduled for dates two or more days in the past. For example, on the 11th November, 2012 all street level routes from the 9th November, 2012 or before, are deleted. The SLROUTECLEANUP cron task runs every day at 12 am.

Managing schedules

You can create and maintain schedules that are based on work record, aircraft, or location hierarchies. The queries you use determine which hierarchy the work records in your schedule reflect.

Graphical Scheduling application

You use the Graphical Scheduling application to manage and schedule work and resources at your organization. The schedules you create are based on work record, aircraft, or location hierarchy. You can view the schedules in the Gantt view to manage them visually.

You can identify possible scheduling conflicts that might arise from multiple concurrent work orders that need the same resources. You can move work records in bulk. For example, you can reschedule all unfinished work from the previous week to the next week. You can also match resources to requirements so that you can address exceptions rather than manually schedule all assignments.

After you create a work schedule, you can view the schedule in a Gantt chart. At a glance, you can see all the work in the schedule, and the resource requirements for that work. You can reschedule work so that resources are not overloaded or underutilized, and compare various work schedules by creating different scenarios. You can change the schedule with the drag-and-drop capability of the Gantt view, and save the changes to the Maximo database.

The Graphical Scheduling application manages constraints to ensure that your work is scheduled properly. For example, you can use task-precedence constraints to specify that some work (such as painting a wall) cannot be started until other work (sanding the wall) is complete. Similarly, you can use the date constraint feature to ensure that tasks that are scheduled to start on a certain date do not supersede tasks that are scheduled to start on an earlier date. Critical path methodology (CPM) can be used to track these dependencies while you make schedule changes, and recalculate the schedule accordingly.

Maintenance costs

Planning maintenance costs includes forecasting costs by using the scheduler features and planning and monitoring budgets in the Budget Monitoring application.

Monitoring maintenance budgets

You can create budget records to monitor maintenance-related transactions in a financial period. Monitoring budget costs can help to ensure that projects or activities, such as work orders, are completed within an agreed budget and can improve estimation of the costs of future projects.

Monitoring maintenance budgets

In the Budget Monitoring application, you can create budget records to monitor transactions in a financial period. Monitoring budget costs can help to ensure that projects or activities, such as work orders, are completed within an agreed budget and can improve estimation of the costs of future projects.

As an administrator, you can create budget records by configuring focal points and calculation rules. Focal points represent the item that you are monitoring in the budget record, such as aircraft, equipment, location, or general ledger accounts or components. You create focal points, for example, to track costs on check type master task cards for a specific model of aircraft. You can configure calculation rules that are based on estimated, approved, and actual costs.

Users create transactions for work orders, purchase requisitions, purchase orders, receipts, invoices, and issues. The budget records then monitor these transactions and are used to create reports.

Budget reports provide a summarized and detailed view of costs by type, such as labor, tools, services, materials. Budget reports also provide a summarized and detailed view of costs by status such as estimated, approved, and actual costs, and compare them with related budgeted amounts.

Related information:

Reporting module

Configuring budget monitoring

In the Budget Monitoring application, you can create or modify focal points and calculation rules. Focal points and calculation rules are used to create budget records that monitor the planned, estimated, and actual costs of transactions.

Procedure

1. In the Budget Monitoring application, select **Manage Budget Focal Points** from the menu.
2. Configure the attributes of the budget focal points.

Option	Description
To configure a predefined focal point	View and modify the predefined focal point attributes.
To create a focal point	Add a new row, set the values for the object and attribute fields, and select **OK**.

3. Select **Manage Rules**.
4. Create new rules or apply predefined rules.

Option	Description
To create new rules	Add a new row, select values for all fields, and select **OK**.
To apply predefined rules	Select **Auto-Configuration**.

What to do next

You can create budgets that are based on the focal points and conditions that you configured.

Creating budget records

In the Budget Monitoring application, you can create budget records to monitor transactions in a financial period. You create budget records to track estimated, approved, and actual costs of aircraft, equipment, locations, and general ledger accounts or components.

Procedure

1. In the Budget Monitoring application, select **New Budget**.
2. Specify the financial period or year of the budget and the supervisor who approves the budget.
3. Add a new row and specify the focal points and conditions for the budget record.
4. To update the budget record with transactions, select **Generate New Budget Lines** from the menu.
5. Update the budgeted amount on each budget line and save the budget record.
6. Select **Change Status** from the menu and specify a value for the status.
7. Select **Approve the Budget**, and specify the approved status.

What to do next

Periodically select **Update Budget Lines** to update the existing transactions for the budget record. The BUDGETUPD cron task is also available to run updates in the background.

Predefined focal points and calculation rules

The predefined focal points are provided and are based on aircraft, equipment, location, and general ledger accounts or components. Predefined calculation rules are also available and are based on estimated, approved, and actual costs.

Table 13. Focal points

Object	Condition	Description
ASSET	BMXLINRPROG	Budget generation for aircraft or equipment
CHARTOFACCOUNTS	None	Budget generation for GL accounts
GLCOMPONENTS	BUDGL01, BUDGL02, BUDGL03, BUDGL04, BUDGL05, BUDGL06, BUDGL07	Budget generation for segments
LOCATIONS	None	Budget generation for locations

Table 14. Calculation rules

Object	Condition	Description
WPTOOL	BUDMON75	Canceled tools.
WPTOOL	BUDMON77	Approved tools.
WPTOOL	BUDMON76	Estimated tools.
WPSERVICE	BUDMON72	Canceled service.
WPSERVICE	BUDMON74	Approved service.
WPSERVICE	BUDMON73	Estimated service.

Table 14. Calculation rules (continued)

Object	Condition	Description
WPMATERIAL	BUDMON51	Canceled stored material.
WPMATERIAL	BUDMON50	Approved stored material.
WPMATERIAL	BUDMON52	Estimated stored material.
WPMATERIAL	BUDMON53	Canceled direct material.
WPMATERIAL	BUDMON55	Approved direct material.
WPMATERIAL	BUDMON54	Estimated direct material.
WPLABOR	BUDMON91	Approved external labor is canceled.
WPLABOR	BUDMON91	Approved external labor.
WPLABOR	BUDMON95	Approved internal labor is canceled.
WPLABOR	BUDMON97	Approved internal labor.
WPLABOR	BUDMON90	Estimated external labor is canceled.
WPLABOR	BUDMON92	Estimated external labor.
WPLABOR	BUDMON94	Estimated internal labor is canceled.
WPLABOR	BUDMON96	Estimated internal labor.
PRLINE	BUDMON68	Approved direct material is canceled.
PRLINE	BUDMON69	Approved direct material.
PRLINE	BUDMON64	Approved service is canceled.
PRLINE	BUDMON65	Approved service.
PRLINE	BUDMON67	Estimated service is canceled.
PRLINE	BUDMON66	Estimated service.
PRLINE	BUDMON71	Estimated direct material is canceled.
PRLINE	BUDMON70	Estimated direct material.
POLINE	BUDMON85	Estimated service is canceled.
POLINE	BUDMON83	Approved service is canceled.
POLINE	BUDMON82	Approved service.
POLINE	BUDMON84	Estimated direct material is canceled.
POLINE	BUDMON89	Estimated direct material.
POLINE	BUDMON87	Approved direct material.
POLINE	BUDMON86	Approved direct material is canceled.
POLINE	BUDMON88	Approved direct material.
TOOLTRANS	BUDMON58	Actual tools that are canceled.
TOOLTRANS	BUDMON59	Actual tools.

Table 14. Calculation rules (continued)

Object	Condition	Description
SERVECTRANS	BUDMON56	Actual service is canceled.
SERVECTRANS	BUDMON57	Actual service.
MATUSETRANS	BUDMON78	Actual stored material is canceled.
MATUSETRANS	BUDMON80	Actual direct material is canceled.
MATUSETRANS	BUDMON79	Actual stored material.
MATUSETRANS	BUDMON81	Actual direct material.
LABTRANS	BUDMON62	Actual external labor is canceled.
LABTRANS	BUDMON60	Actual internal labor is canceled.
LABTRANS	BUDMON63	Actual external labor.
LABTRANS	BUDMON61	Actual internal labor.

Configuring task cards and master task cards

Task cards contain detailed information for scheduled maintenance work on aircraft or pieces of equipment. When tasks become due, work orders are generated. Warnings are generated when task cards meet or exceed their warning limit, to prevent the task cards becoming overdue.

Task cards can contain job card information that is copied to work orders. In the Master Task Card application, you can select the **Add/Replace Job Card** action to specify the new job card that you want to add to the master task card. If the master task card has an existing job card, the new job card replaces the existing job card.

You define a frequency schedule that determines when work orders are generated to perform the task. You can define frequency intervals on a task card. Or you can define frequency intervals on a master task card and associate the master task card with a task card. The frequency intervals that are defined for the master task card then apply to the associated task card. You can configure the master task card to automatically adjust the next due date for maintenance tasks.

You can use the Master Task Card application or the Task Card application to define inspections that are related to airworthiness. In the **Planning** tab, you can select inspection 1 or inspection 2 as the work type. Inspection 1 is a general inspection, and inspection 2 is a more detailed type of inspection. Typically, an inspection 1 occurs more frequently than an inspection 2.

You can also define a sample task and a sample frequency schedule on a master task card. You set the sample threshold and sample interval of maintenance tasks for aircraft that are included in the sampling program that is outlined in the OMP.

In the Master Task Card application, you monitor the maintenance tasks that affect the weight and balance of an aircraft. You can associate the weight and balance details in the master task card to task cards, job cards, work orders, and work packages. You can enable version control of task card records to track revisions of task cards.

Related tasks:

"Defining check loops" on page 52
You can create check loops to break down the requirements of an aircraft check into a sequence of related checks. In an OMP, you can enable check loops to maintain a sequence and manage the frequency of maintenance tasks for an aircraft to meet regulatory maintenance requirements.

Associating task cards with master task cards

When you associate a task card with a master task card, the frequency schedule is managed by the master task card. When you configure schedule frequencies on master task cards, alerts and warnings are propagated to associated task cards.

Procedure

1. In the Master Task Cards application, select a master task card that has at least one entry in the CM Parts table. The CM parts must be associated with the aircraft or equipment for which you want to create task cards.
2. Select the **Create Associated Task Cards for Part's Aircraft or Equipment** check box.
3. Select the **Create Associated Task Cards for CM Parts** check box.
4. Select the aircraft or equipment with which you want to associate the task card and then click **OK**.

Frequency iterations for generating work orders from task cards

Task cards specify frequency information that determines when work becomes due. Or frequency information can be defined in a master task card and then propagated to associated task cards.

Maintenance planning documents (MPDs) from manufacturers include frequency information for each task card. Routine tasks become due each time a specified number of flight hours or flight cycles is reached. These task cards can specify one calendar-based frequency interval and multiple meter-based frequency intervals.

Determining the frequency of some tasks is more complex, because they are based on the average flight time, when the ratio of flight hours to flight cycles has to be evaluated. MPDs include the following frequency information for these tasks:

- Interval and optional threshold values that are based on calendar and meter values
- A fatigue rating (FR) value that indicates how sensitive the task is to flight hours
- Adjustment factors that revise intervals and thresholds when the acceptable average flight time is exceeded

When you import task cards that are based on average flight time from an MPD into the Maintenance Task Library application, the frequency values, fatigue rating, and adjustment factors are also imported. You can modify frequency values and associated adjustment factors on imported task cards to meet your business requirements. Or you can add new task cards and master task cards and manually define frequency values and adjustment factors.

You can review and modify adjustment factors, and add new adjustment factors by selecting the **Apply Adjustment Factors** action in the Task Cards or Master Task Cards application.

Several adjustment factors can be associated with a frequency schedule. Each factor includes a condition that evaluates as either true or false, and a mathematical formula that evaluates to a number. When a condition is true, the output of the formula is used to recalculate interval and threshold values.

Formulas use the following standard notation:
- To refer to a meter that was configured in the Meters application, use angular brackets. For example, [$AFT] refers to a continuous meter that records average flight time.
- To refer to the value in a field on a business object, use a colon followed by the name of object field. For example :PLUSAFATIGUERATING refers to the value in the **FR** field.

If the acceptable value for average flight time is 5.55, when the value is less than or equal to 5.5.5, no adjustment occurs. If the average flight time exceeds acceptable limits, the interval and threshold values are revised based on the formula specified for the adjustment factor, as in the following example:

Table 15. Example adjustment factors

Adjustment factor	Condition	Formula
1	1.6/[$AFT]<=5.55	1.6/[$AFT]
2	[$AFT]>5.55	1-(([$AFT]-1.6)x:PLUSFATIGUERATING

Alert intervals and warning intervals

Alert intervals and warning intervals are used to monitor scheduled maintenance. An alert interval is the point at which a work order is generated. A warning interval is the point at which a warning is issued to inform you that a task card record is almost overdue.

You configure these intervals on the **Frequency** tab of the Task Cards application. The Equipment application color-codes warnings and overdue task cards.

The alert interval and warning interval can represent a combination of one or more meter-based values and only one time-based value. Time-based values can be based on one of the following measures of time:
- The number of days after the active date of a task card.
- A percentage of elapsed time between the active date and the due date of a task card.
- The number of days before the due date of a task card.

Example of work order generation

The following example shows when the build data interpreter generates a work order for task card records with a 120-day frequency attribute and different state attributes. The default state attribute for a new record is Absolute from Active.

Table 16. Example of when work orders are generated

Frequency	Alert and warning interval state	Alert interval	When a work order is generated
120 (days)	Absolute from Active	80	80 days after the active date of the task card record.

Frequency	Alert and warning interval state	Alert interval	When a work order is generated
120 (days)	Percent of Frequency from Active	66.7	After two-thirds of the time between the active date and due date of the task card has elapsed.
120 (days)	Absolute Prior to Due	40	40 days before the due date of the task card record.

You specify the state attribute and the initial alert interval and warning interval when you add a task card record. If you later update the state attribute, the build data interpreter adjusts the intervals as shown in the following examples:

Table 17. Example of changes to the alert and warning interval state values

Frequency	Original value for the alert and warning interval state	Updated value for the alert and warning interval state		Warning interval
120 (days)	Absolute from Active	-		90
120 (days)	-	Percent of Frequency from Active		75
120 (days)	-	Absolute Prior to Due		30
120 (days)	-	Absolute from Active		90

Version control of master task card records

The maintenance program for an aircraft or equipment consists of master task card records that are associated with a configuration-managed (CM) part, which is associated with a model record. When the master task cards for a model are aggregated with other records, such as technical records and deferred work orders, they constitute the maintenance program. Version control of the master task card records helps an organization to maintain regulatory compliance.

You can enable version control of master task card and task card records in the Organizations application. When you create a master task card record, the numbering of the versions starts. If changes to the master task card record are required, the version number of the master task card record increments by 1, and the status is changed to pending revision. After you save the changes, you can set the status of the master task card record to active. You cannot revert to previous versions.

You can opt to create the associated task card records for the master task card record. The associated task card records are created with a revision number of 0 and a status of active. You can also choose to update associated task card records with any changes that are made to the master task card record. If an update is required, then the associated task card record is duplicated, and its status is set to revised. The task card record is then updated with the changes from the master

task card, and its revision number is increased by 1. You can select the **Override Updated from Master Task Card** check box on a task card record so that updates from the master task card record are not made to the task card record.

When a task card record is revised, the **Task Card Revised** check box is selected on any open work orders that are associated with the revised record. The worker who is assigned to a work order that is associated with a revised task card record can decide whether to proceed with the work order. Alternatively, the worker can cancel the work order so that a new work order is created for the revised record.

You can use the **View Revision History** action to view the version history of the master task card record to see all past revisions. The version history includes the previous maintenance history if required. The version history can support an audit after an incident or can be useful when you plan future maintenance programs.

Task card groups

You use the Task Card Groups application to classify master task card records and manage task card actions by task card groups. You also can organize master task card records and task card groups by hierarchy to be more efficient when managing and controlling task card actions.

Task card records are grouped by task type, and these groups are task card groups. By using the Task Card Groups application, you can manage relationships between task card records that are in the same task card group and between task card records that are in different groups. To manage the relationships between these records, you can create actions, such as COMPLETE, between the following groups and records:

- A master task card group that relates to another master task card group
- A master task card group that relates to a master task card record
- A master task card record that relates to a master task card group
- A master task card record that relates to another master task card record

The Task Card Groups application provides a v-tree control to manage relationships between task card records and task card groups. You can use the v-tree control to define and view master task card records and task card actions within the hierarchy. You can specify the task card group number and reset the job card sequence in the Task Card Groups application and the Master Task Cards application.

When a task card action is created between two master task card groups, a task card action is created for each task card record on the target group for every existing task card record in the source group. A master task card must be able to initialize a task card group COMPLETE action.

A task card group consists of members and actions:

Members
The task card records that belong to the group. Master task card records also show associated task card records as child records.

Actions
The task card actions that are run against the task card records that are in the **Action** node in the v-tree hierarchy.

If you are building a task card group of master task card records, only master task card records and master task card groups are available for selection. If the task card group relates to task card records only, then task card records and task card groups are available for selection.

Task card groups are unique per each pair of site and task card record. However, a master task card or task card record can be a member of more than one task card group, which can result in a circular reference.

To add a task card action to a master task card record, you use the **Create Associated Actions** action in the Task Card Groups application. All task card groups and associated actions that are created in a v-tree hierarchy update when the related master task card and task card records are saved.

You can select and add actions to task card groups in the v-tree hierarchy by right-clicking on the v-tree node. The same actions are available also on the **Action** menu of the Task Card Groups application.

The actions that are available are different for the **Members** and **Actions** nodes in the v-tree hierarchy:

Table 18. Task card group actions that are available in the v-tree hierarchy

Node	Available task group action	Description
Actions	Activate	Select this action when the primary task card record is complete.
	Complete	Select this action for claims when the primary task card record is complete.
	Create WO	Select this action when the work order is already created for the primary task card record.
	Deactivate	Select this action when the primary task card record is complete.
	Off-Activate	Select this action when the related aircraft or equipment is removed from the task card record.
	Off-Deactivate	Select this action when the related aircraft or equipment is removed from the task card record.
	On-Activate	Select this action when the related aircraft or equipment is installed in the task card record.
	On-Deactivate	Select this action when the related aircraft or equipment is installed in the task card record.

Managing maintenance work

Managing maintenance work involves configuring job cards, work packages, and work orders to provide the detailed information that is required to perform maintenance.

Job cards

A job card is a detailed description of work that is performed for a work order. You use the Job Cards application to create and manage job cards.

When you create a job card, you specify planning and scheduling information that can be used by the Task Cards and Work Order Tracking applications. You can

specify the maintenance review board (MRB) number, capability, class, and category for the job card. You can also specify the operation number, work station, phase, CMR, and customer for the job card.

You can populate a job card from an operation list in a maintenance planning document (MPD) that is provided by a manufacturer. Use the Maintenance Task Library (MTL) application to create MTL records, import MPD job card data into them, and manually add job cards. You can also manually configure information in a job card in the Job Cards application by using the look up actions on fields to locate the related information from database records and domain values.

Operations that are on the job card include information that is gathered from other applications and describe the following aspects of the work:
- Labor is defined in the Labor application and can include information about skill sets and labor costs that are calculated for the time that it takes to perform the operation.
- The materials that are required to complete the work include parts that are available from the Inventory application and consumable parts that are defined in the Equipment application.
- Service items that are required to complete the work are available from the Service Items application, which can include unit costs and vendor information if they are available.
- The tools required to complete the work and their costs are available from the Tools application.
- Access items that must be opened and closed to provide access for the work are available from the Models application.
- Information that indicates the aircraft zones where the work occurs are available from the Zones application.

When you associate a job card with either an aircraft or piece of equipment, a CM part, a location, or a part, the job card becomes effective for that record. You can also associate a safety plan with a job card and specify the sites and organizations for which it is effective. The **Operators Maintenance Program Details** action enables you to view information about OMPs and associated master task cards that are related to the job card.

You can duplicate a job card to use as a template for a new job card, and you can create a revision of a job card that is in active status. When you create a revision, the record is copied into a new job card, and the revision number is incremented by 1. The original job card status remains in the active status, and the new job card is set to pending revision. When the new job card is activated, the original job card status is set to revised.

You can apply job card records to task card records and work orders. After a job card becomes a work card on a work order, you can change the work card without affecting the job card. In the Master Task Card application, you can select the **Add/Replace Job Card** action to specify the new job card that you want to add to the master task card. If the master task card has an existing job card, the new job card replaces the existing job card.

You also can create a job card from a work card that you use frequently.

Related information:

Customers and job cards

Configuring work packages

A work package is a set of work orders and task cards that define work that can be completed during the same maintenance period in the same repair location. By configuring work packages, you can combine scheduled and non-scheduled work to achieve resource efficiencies when work is performed.

Work packages

A work package defines a set of maintenance tasks that are performed on an aircraft during a specified maintenance period. Work packages include details about the tools, materials, labor, skills, and repair locations required to perform the work. You can associate a work package with a customer and a related customer agreement.

When you create a work package, you must add the main work order. The work order must be associated with an aircraft or piece of equipment, must be in the open status, and cannot be associated with another work package. The following values are set in the work package from values that are provided by the main work order:

- Scheduled start and end dates for performing the work which you can modify
- Read-only values in the **Start No Earlier Than**, **Start No Later Than**, and **Estimated Duration** fields

After you add the main work order, you can add the following information to the work package:

- You specify the aircraft that the work package applies to.
- You can specify an MRO location where the work is to be performed.
- If the work package is for a customer, you can specify a customer and customer agreement.
- You can modify the scheduled start and end dates.

After you add the main work order, you can use the **Add Tasks and Work Orders to Work Package** action to add any combination of valid work orders and task cards to the work package. A valid work order or task card satisfies the following conditions:

- It is related to the aircraft to which the work package applies.
- It has a relationship to the customer, if a customer is specified.
- It is not associated with another work package.

You can use the Maximo Integration Framework to import a set of work orders that a customer provides. You can then create a work package with these work orders and validate the work package against a copy of an OMP that a customer provides.

Creating work packages

When you create a work package, you specify the main work order and then add valid work orders and task cards to construct the package. You specify the aircraft or equipment record that the work package applies to, the scheduled start and end dates for the work, and the MRO location where the work is carried out.

Procedure

1. In the Work Packages application, create a record.
2. Specify the main work order.
3. Specify the aircraft or piece of equipment that the work package applies to.

4. Specify the start and end dates for the work.

5. Specify the MRO location where the work is carried out.

6. Optional: Specify a customer and a customer agreement.

7. Select the **Add Tasks and Work Orders to Work Package** action to search for valid task cards and work orders to add to the work package.

8. Select the **Generate Work Orders** action to create work orders for any task cards that do not have work orders associated with them.

9. Save the record.

Adding customer work packages

MRO operators can import a set of work orders that a customer provides and compare imported work orders with existing job card records to construct a work package.

Procedure

1. Use the Maximo Integration Framework to import a set of work orders that are arranged in a hierarchy.

2. In the Work Orders application, open the parent work order of the set of work orders that you imported.

3. Select the **Match Job Cards to Work Orders** action and select the associations that you require. Task numbers on work orders are compared to task numbers on job cards to identify records that match.

4. Optional: Review the entries in the Work Card With No Matching Entries section and assign job cards where appropriate.

5. Save the record.

Monitoring maintenance progress with work orders

A work order specifies a particular task and the labor, materials, services, and tools that are required to complete the task. You can also associate configuration-managed parts with work orders and create work orders that are a result of the cannibalization process.

Creating work orders

A work order specifies the information about the work that must be performed for an aircraft, piece of equipment, a location, or a rotable part. You can add work cards, job cards, or safety plans. You can also record actuals as the work progresses.

About this task

You create work orders in the Work Order Tracking application. If you previously created similar work orders, you can save time by using the Duplicate Work Order action.

You can duplicate a work order with its operations, without its operations, or with its hierarchy. When you duplicate a work order hierarchy, the child operations are also duplicated. If a work order that you are duplicating has a job card or a safety plan, these plans are copied to the duplicate work order. Work actuals, failure reports, and planned moves or modifications are not copied to the duplicate work order.

Procedure

1. In the Work Order Tracking application, click the **New Work Order** icon in the toolbar.
2. Specify whether you are creating the work order for a location, aircraft, piece of equipment, rotable part, or general ledger account. If a selected location has a single associated aircraft or piece of equipment, the value of the aircraft or piece of equipment is copied to the record.
3. Optional: Specify a type for the work order and the priority of the work order for scheduling purposes.
4. Specify any additional schedule information and responsibility information. You can specify a job card, safety plan, failure class, scheduling information, and planned labor, materials, tools, and services.
5. Save the work order.

Creating work orders to monitor maintenance progress:

Work orders start the maintenance process and create a historical record of the work that is performed. A work order specifies the information about the work that must be performed for an aircraft, piece of equipment, or location.

About this task

The term *work order* can refer to a work order, change, release, or activity record. You can add work cards, job cards, and safety plans to work orders. As work progresses on an approved work order, you can report the actual labor, estimated hours, materials, services, and tools that are used.

To simplify the process of finding and managing records, you can create classifications to categorize work orders. Classifications identify work orders by the type of part, such as an engine. Classifications have attributes that further identify a part by providing more details, such as type of engine or engine manufacturer.

Workflow processes use relationships between work orders and operations to automate the flow of status changes. You set relationships between work orders and operations so that when an operation is completed, the next operation in the flow can be initiated.

Procedure

1. In the Work Order Tracking application, create a work order.
2. Specify the owner of the work order.
3. Create a work order management plan to monitor operations, job cards, task cards, safety plans, and associated hazards that are related to the work order that you created.
4. Create work assignments on the work order.
5. Categorize work orders by using classifications and attributes.
6. Optional: Create an alert for the status of a work order.
7. Optional: Create a work flow process to automate the flow of status changes.
8. Optional: Associate a service level agreement to the work order that outlines an agreement with a service provider.

What to do next

After you create a work order, you can relate it to other work records or include the work order in a work package. You can track the progress of work by taking the following actions:

- Report actuals on a work order as work progresses.
- Reschedule work with assigned resources or unassign the resources that are assigned to the work order.
- Add meter readings on a work order for associated aircraft, equipment, and locations.
- Report the downtime for an aircraft or piece of equipment that are associated with the work order.

Ownership of work orders:

You can designate an individual or a group as the owner of a work order or ticket. Ownership means that a person or group has administration responsibility for that record. Assigning ownership does not change that person or group's availability to work or to have ownership of additional records.

Ownership can change during the processing cycle of the record. You can change ownership until the record has a status of CLOSE.

You use the **View History** action to see the ownership and status history of a record. Record ownership is not required for a work order or ticket.

You can assign ownership in the following ways:

- Use the **Select Owner** action to choose a person or owner.
- Use the **Take Ownership** action if you want to be responsible for that record.

Work order management plans:

After you create a work order, you can use the **Plans** tab to specify estimates for labor, craft, materials, services, and tools. You also can add child work orders and create operations for the work order.

Job cards

An easy way to add a work card to a work order is to associate a job card with the work order. When you enter an identifier in the **Job card** field, the system copies the job card, called a work card, to the work order. You can also add a job card by using another application to generate a work order that already has a job card.

When you add a job card to a work order, if a safety plan is associated with the job card, it is copied to the work order. Changes that you make to the work card or safety plan in an individual work order do not affect the original job card or safety plan.

Operation plans

You can insert or edit work card operations on the **Operations** tab. You can also add inspection data for the aircraft or equipment.

If a current work card is based on a job card, all operation and card data is copied from the job card. The job card serves as a template for the work card. Changes that you make to the work card on the work order do not affect the original job card.

You can add or edit card operations until the work order is closed. You cannot delete operations if the work order is approved or has actuals reported for the operation.

After you close the work order, you can use the **Edit History Work Order** action to add or modify operations.

Analysis of failure data associated with work orders:

Failure data enables you to record and view aircraft, equipment, and location problems, causes, and remedies that are associated with work orders. This information enables you to identify trends and isolate probable causes of breakdowns.

You can conduct failure analysis to review the history of aircraft, equipment and location failures over time. For example, you can review issues, such as breakdown trends or mean time between failures. You can correlate this failure information with other data, such as task cards schedules, to develop ways to reduce aircraft, equipment, and location failures.

Failure data must belong to one or more failure hierarchies, which you create in the Failure Codes application. When you report failures, you use failure hierarchies.

A failure hierarchy is an organized set of data on problems, causes, and remedies that are related to aircraft, equipment, and locations. The failure hierarchy is identified by a top-level failure code, called a failure class. If an aircraft, piece of equipment, or location on a work order is associated with a failure class, the default failure class value is the associated failure class.

Associating safety plans with work orders:

To help ensure that the work is performed safely, you can associate a safety plan with a work order.

Procedure
1. In the Work Order Tracking application, open a work order.
2. In the Job Details section, specify a safety plan to associate with the work order and save the record.

Safety plans:

In the Work Order Tracking application, you can associate a safety plan with an unapproved work order. Safety plans help ensure that the work is performed safely.

A work order can have only one associated safety plan. If a work order already has an associated safety plan, you must first remove the existing safety plan before associating a new one. When you change the safety plan information in a work order, the original safety plan in the Safety Plans application remains unchanged.

A safety plan can be automatically associated with a work order in the following cases:

- A job plan is added to a work order.
- A work order is generated by a condition monitoring or task card record that has an associated job card.

Safety hazards that are associated with work orders:

You associate hazards with the aircraft, equipment, or location that is listed on a work order by adding hazards to the safety plan.

The association between the aircraft, equipment, or location on the work order and its related hazards must exist on the record. Safety-related aircraft or equipment might have safety hazards that affect the work environment for the current work order.

You use the **Select Safety Hazards** action to add safety hazards. Safety hazards include the following information:

- Whether the aircraft, equipment, or location can have tag outs.
- Whether the aircraft or equipment can have hazardous materials.
- Whether the aircraft, equipment, or location can have precautions.

If you enter any item that is also identified as hazardous material, information for the hazard is automatically added in the **Safety Plan** tab.

Categorizing work orders by using classifications and attributes:

To simplify the process of finding and managing records, you can categorize work orders. Classifications identify work orders as involving a type of part, such as a notebook. Attributes further identify the part by providing more details. For example, a portable computer can have the memory, speed, and disk space attributes.

Procedure

1. In the Work Order Tracking application, display the work order that you want to categorize.
2. On the **Specifications** tab, specify a classification.
3. Select the attributes.
4. Save your changes.

Enabling task card alerts for work orders:

You can use task card alerts to notify you of pending task card work that is scheduled for aircraft, equipment, or locations in work order records.

About this task

The site that is listed on the work order must be configured to enable alerts. You configure task card alerts for sites in the Organizations application.

Procedure

1. In the Organizations application, select the **Task Card Options** action and specify a status that work orders must reach to generate task card alerts.

2. In the Task Card application, create a task card record for aircraft, equipment, or for a location.
3. In the Work Order Tracking application, create a work order that requires the same aircraft, equipment, or location. Task card alerts are shown when the status of the work order record reaches the status that you have specified.

Setting up workflow processes:

Work process flows use relationships between work orders and operations to automate the flow of status changes. You set relationships between work orders and operations so that when an operation is completed, the next operation in the flow can be initiated. You can set up the process flow as a work template at the job card level.

Before you begin

To set the workflow process for individual operations, you must select **Under Flow Control** at the header level for the work order.

Procedure
1. Open the work order and, on the **Plans** tab, open the operation.
2. In the **Scheduling Information** section, specify the predecessor operations that must be completed before this operation is initiated.

Defining flow actions:

A flow action is used in a workflow process to define certain actions that should occur while work is being done. Actions or action groups can be applied to any work order, operation, or job card task.

About this task

You can determine whether the action takes place automatically, or if the action only takes place when it is initiated manually. When automatic, the action takes place as soon as the work order or task status is changed to an in progress (INPRG) status value by the workflow process. When manual, you must initiate the flow action by running the automation or processing scripts or placing an action button on the target application. Actions and action groups are defined in the Actions application.

Procedure
1. In an application that supports flow action, open the record for which you want to define a flow action.
2. Perform one of the following actions:
   - For a work order, change, release, or job card record, in the **Flow Action** field, specify a value.
   - For a work order or job card operation, in the Operations table window, specify a value in the **Flow Action** field.

   The defined action runs when the work order or operation status value is changed to INPRG.
3. Specify whether you want the flow action to be automatically or manually run.

Suspending workflow processes:

You can suspend the workflow process for work order or operation records that have it defined. For example, if you want to start a work order or operation manually, you could suspend the flow control on that record. The flow remains suspended until you remove the suspension.

About this task

Removing the suspension restarts the flow. Any successor work orders or operations with completed predecessors continue the process. Work orders and operations without predecessors continue the process at the same time as the parent record. The last completed child under a parent rolls its completion up to the parent.

Procedure
1. In an application that supports flow action, open the record on which you want to suspend flow control.
2. On the main application tab, at the header level, select the **Suspend Flow Control** check box. The workflow process is suspended on the work order and on all of its operations.
3. To retain flow control for individual operations, on the **Plans** tab, open the operations in the Operations table window, and clear the **Suspend Flow Control** check box at the task level. Flow control remains in place at the operation level. This action does not affect the suspension at the work order header level.

Example

You generally suspend a set of operations, often under the same parent. For example, you can delay the automatic starting of one whole phase of work until a certain condition has been met. You can also delay starting a phase of work to make changes to the operations, such as inserting operations, deleting operations, and changing the precedence logic.

Removing workflow processes from work orders or job cards:

You can remove workflow process for a work order, a job card, or operation records that have it defined. You can do this at the header level, which will remove it for all the associated operations as well, or you can remove it at the operation level.

About this task

If workflow process is removed at the header level, it will automatically be removed on individual operations on the record. You cannot retain workflow process for an operation that does not have it set at the header level.

Procedure
1. In an application that supports flow action, open the record that you want to remove from workflow process.
2. On the main application tab, clear the **Flow Controlled** check box. The system removes the work order or the job card and all of its operations from workflow process.
3. Click **Save Record**.

Stopping workflow processes:

You can stop a workflow process for a record. You can use the Workflow Administration application to view and stop workflow processes.

Before you begin

The application that is associated with the workflow process record must be enabled for workflows.

Procedure

1. In the Workflow Administration application, select the active process that you want to stop and click **Stop Process** on the assignment line.
2. Optional: Create an e-mail notification. You can use the WFSTOP communication template to create the notification. You can also manually specify the subject, message, and role recipients.
3. Click **OK**.

Service level agreements:

A service level agreement (SLA) typically is a written agreement that outlines the commitment between a service provider and its customers. A commitment is a service level that all parties have agreed to, such as aircraft or equipment reliability or availability.

The SLA describes one or more commitments and the escalation actions or notifications that are associated with each commitment. Escalation actions or notifications might be associated with an SLA to ensure that commitments are met. An escalation process can monitor all activities and send notifications or perform other activities to ensure that commitments are met.

The types of records to which service level agreements can be applied include tickets, such as service requests, and work-based records, such as work orders. Before you can apply an SLA to a record, the record must have a site defined.

A service level agreement can be associated with a record in several ways:
- An SLA might automatically be applied to a record from within a workflow or escalation process or from another SLA.
- You can select an action to apply an SLA, which applies the best match automatically.
- You can view SLAs and select an action to select or clear the SLAs that you want to manually apply to the record.

When you apply a service level agreement to a record, any escalations that are associated with the SLA are activated. The following dates for the record might be calculated automatically:
- When an SLA is applied that includes a response commitment, the response commitment date is used for the target start date.
- When an SLA is applied that includes a resolution commitment, the resolution commitment date is used for the target finish date.
- When an SLA is applied that includes a contact commitment, the contact commitment date is used for the target contact date.

Record relationships and work orders

Relationships between records, such as work orders and tickets, help to simplify record management. You can create record relationships manually or relationships can be created automatically when you take certain actions.

The following types of relationships can exist between records:
- Related
- Originator and follow-up
- Related to global

Related records

By using the Work Order Tracking application, you can view records and relate work orders to the current record. Relationship to other records does not determine status inheritance, affect workflow, or follow a set of business rules. Relationships between records can be many-to-many, and do not represent record hierarchies.

You use the **Related Records** tab of the Work Order Tracking application to create relationships to other work orders and tickets. You can also remove relationships to other work orders and tickets.

When you create relationships between records, you can take the following actions:
- Modify related records.
- View related information for similar records.
- View open tickets that are associated with a specific field in the Work Order Tracking application.

Originator and follow-up work orders

From the current work order, you can create another related record by selecting the **Create** action. When you create a work order or a ticket from an existing work order, the new record has a status of Follow-up. The original work order has a status of Originator.

You create follow-up work orders to associate work orders and tickets with each other and keep them in separate hierarchies. The costs of the follow-up work orders in separate hierarchies do not roll up to the same parent. For example, you can create a follow-up work order when you complete a job to record that additional work is needed on the same aircraft, equipment, or location.

A follow-up work order can determine the status of its originating work order. An originating work order cannot change the status of a follow-up work order. A follow-up work order cannot change the status of the originator work order if there is more than one follow-up. Your system administrator can configure these options.

When you create follow-up work orders, the aircraft, equipment, location, and general ledger account are copied from the originating work order to the follow-up work order.

You can view follow-up work orders on the **Related Records** tab of the originating record but you cannot remove them.

Globally related tickets

A global record is a ticket, such as a service request, a problem, or an incident record, that describes an issue that affects many users. To make a ticket a global record, you must select the **Global Issue** check box on the ticket. You can then select the **Show Similar Tickets** action to select tickets to relate to the global ticket, which creates a RELATEDTOGLOBAL relationship.

You can use this relationship type to manage all tickets that are included in a global ticket. When you change the status of a global ticket, the status of all globally-related tickets is also changed. If your administrator has set up automated notifications of status changes, then the system changes the status of the tickets related to the global issue. All of the initial requesters reporting the same issue are notified of its resolution.

On the global ticket, you can view a list of related records and view the work and communication logs for all related records. You cannot designate a record as global if it is already related to a global record or if it is a history record.

Work packages

When you create a work package, you group existing work orders under a new parent work order. A work package can be used to separate and track incomplete operations on a work order that is nearly completed.

For example, when you have a work order with 100 separate operations and 90 of the operations are already completed. You can group the remaining 10 operations into a work package with a new parent work order. The 10 operations become operations on the new work order, and any work orders that are not operations become children of the new work order.

To create work packages, select the work orders, then use the **Create Work Package** action.

In an OMP record, you can specify relationships between checks to define higher checks, lower checks, and task cards for maintenance operations that are associated with each check. Work orders that are generated from higher checks, lower checks, and task cards are automatically placed into a work order hierarchy. The hierarchy mirrors the relationships that are specified between checks in the OMP. When the status of a work order is set to complete, the statuses of the child work orders are also set to complete.

Related concepts:

"Operator maintenance programs" on page 50
Aircraft operators define operator maintenance programs (OMPs) and associated maintenance checks for each type of aircraft type in their fleet. When the maintenance program is approved by the aviation authority, the OMP is activated and becomes the controlling document for maintenance of that aircraft.

Related tasks:

"Defining check loops" on page 52
You can create check loops to break down the requirements of an aircraft check into a sequence of related checks. In an OMP, you can enable check loops to maintain a sequence and manage the frequency of maintenance tasks for an aircraft to meet regulatory maintenance requirements.

Rescheduling and unassigning work

You can reschedule work that has been assigned to labor resources to accommodate changes in priority or scheduling. You can reschedule multiple work records at the same time by using the Reschedule Assignments window.

About this task

You can reschedule all work that has been assigned over a certain time period, or to a certain person. You can reschedule multiple work records to the same labor record for a different time period, or you can unassign the work so that you can later assign it to someone else.

Procedure

1. On the **Assignments** tab of the Work Order Tracking application, open the work records that you want to reschedule.
2. Select the **Reschedule Assignments** action. The Reschedule Assignments window opens.
3. To reschedule assignments to the same labor records but with a new date, enter the new date in the **Reschedule Date** field, and ensure that the **Reschedule the Assignments** check box is selected.
4. To unassign work without changing the scheduled start date and scheduled finish date on the work records, leave the **Reschedule Date** field blank and clear the **Reschedule the Assignments** check box.
5. To update the scheduled start date and scheduled finish date on the work records, enter a date in the **Reschedule Date** field and clear the **Reschedule the Assignments** check box.

Tracking the progress of work on work orders

A work order specifies the aircraft, piece of equipment, location, and the work that is required. You can report actuals, reschedule or unassign work, specify meter readings, or report downtime for aircraft or equipment.

Reporting actuals for work orders:

As work progresses on an approved work order, you can report the actual labor hours, materials, services, and tools used.

Procedure

1. Open the work order for which you want to report actuals.
2. On the **Actuals** tab, enter the details on the following subtabs:

Option	Description
Labor	Report hours for labor, copy labor from the work card, or select planned labor.
Materials	Select materials, select reserved parts, and select consumable parts.
Services	Select services or standard services.
Tools	Select tools, copy tool data from the work card, or select tools that were issued to the work order.

3. Save the record.

Measurement points for aircraft or equipment on work orders:

Aircraft or equipment on a work order can have measurement points, which allow you to track the usage and condition of your aircraft or equipment. You can add measurement points to a work order until the work order is closed.

Measurement points are copied to work cards when the following parts are matched:
- The measurement point name on the job card that is listed on the work order.
- The measurement point name on the aircraft or piece of equipment that is listed on the work order.
- A measurement point number for the measurement point name.

If you add a value for a measurement point, the new measurement and measurement date are copied to the MEASUREMENT database table. If you add a measurement without adding a value for the measurement point, the measurement data is saved with the work order. When you save a work order with measurement point data, the **Measurement Point** field becomes read-only.

Reporting downtime for aircraft or equipment:

You can report the start time and the end time of the downtime for an aircraft or piece of equipment after it has occurred. You can create multiple downtime reports for a single work order.

Procedure
1. Open the record that has the aircraft or piece of equipment for which you want to report downtime.
2. Select the **Report Downtime** action.
3. In the Downtime Report section, select the **Report Downtime** option.
4. Specify the date that the downtime started.
5. Enter a date the downtime ended or will end.
6. Select a downtime code.
7. In the Downtime Type section, specify whether the downtime occurred when the aircraft of piece of equipment was operational or non-operational.
8. Click **OK**.

Swapping aircraft or equipment:

You can swap aircraft or equipment that is associated with a work order. The swap action applies to the work order and all of the aircraft, equipment, locations, and rotable parts that are on its child work orders.

About this task

You can execute the swap immediately, or you can save the swap as a plan. If you save the swap as a plan, the changes are applied when the status for the work order is complete. When the status of a work order is complete, you can swap aircraft or equipment only by using the **Execute Now** option. When you select **Execute Now** on any tab, changes are applied on all tabs.

When you duplicate a work order that has a planned swap to its aircraft, equipment, or locations, the planned action is not copied to the duplicate work

order. Also, when you create a release, change, or work order from a record, the planned action is not copied to the follow-up record.

Procedure

1. Select the **Move/Swap/Modify** action.
2. On the **Move/Swap** tab, select the **Is this an Aircraft or Equipment Swap** checkbox.
3. In the Swap Aircraft or Equipment section, select the row for the aircraft or equipment that you want to swap.
4. To move the aircraft or equipment to a parent or location, type a value in the appropriate field.
5. In the **Replacement Aircraft or Equipment** field, specify an aircraft or piece of equipment.
6. Perform one of the following actions:
   - To swap the aircraft or equipment immediately, click **Execute Now**.
   - To swap the aircraft or equipment when the status for the work order is COMP (Complete), click **Save as Plan**.

Cannibalization process overview

To meet operational requirements and to dispatch an aircraft, you must replace a defective component, but your inventory balance might be zero. By using the cannibalization process, you can remove the component from a serviceable aircraft or piece of equipment and install it on another.

The regular maintenance procedure is completed by issuing a replacement component from inventory, installing it, completing the work and releasing the aircraft or piece of equipment into service. However, you might have zero balance available from inventory and the lead time to obtain a replacement exceeds the operational schedule requirements.

In this case, a cannibalization (robbery) process can be authorized. The required component is removed from a designated aircraft or piece of equipment (the donor aircraft or piece of equipment), inspected, and installed on the unserviceable aircraft or piece of equipment (the receiver aircraft or piece of equipment). You can use the cannibalization process at any point until the work order is completed, closed, or canceled.

When the work is completed, the aircraft or piece of equipment is dispatched into service. A work order is issued against the donor aircraft or piece of equipment to generate the demand against inventory by following regular procedure. Any reservations that are made against the receiver aircraft or piece of equipment must be canceled or transferred to the donor aircraft or piece of equipment.

The cannibalization process is a relatively common practice that must be rigorously managed and controlled to maintain regulatory and safety compliance. Efficiency is also a priority, because the cannibalization process is typically applied under operational pressure and tight deadlines.

You use the **Materials** tab, under the **Plans** tab of the Work Order Tracking application, to specify and approve a cannibalization process. The cannibalization details show on the **Robbery details** section, when you select the **Robbery** check box. You can have a robbery action for each item line.

You might consider using the cannibalization process in the following situation:

- If you specify an item number and the availability check shows that there is no stock, and
- If you have the aircraft or piece of equipment under the AOG status.

This validation is not enforced, and the **Robbery** check box is available for selection despite of these conditions.

Cannibalization process status changes

The cannibalization process can assume different statuses while procedures are applied.

Table 19. Statuses of the cannibalization (robbery) process

Status	Description	Validation
PENDG (pending)	The default status when the robbery action is created.	You can specify this status if the **Robbery** check box is not selected.
NAPPR (not approved)	The robbery action is not approved, and all other fields are read only.	None
APPR (approved)	The robbery action is approved.	You cannot specify this status if the **Robbery** check box is not selected.
COMP (complete)	The robbery action is complete, and the donor aircraft or piece of equipment is available to be issued to the receiver aircraft or piece of equipment.	You must specify all fields. You cannot specify this status if the **Robbery** check box is not selected.
CANC (canceled)	The robbery action is no longer required. The user is responsible for canceling any associated work orders, purchasing records, and others.	You cannot specify this status if the **Robbery** check box is not selected.

Example of the cannibalization process

A passenger aircraft is due to depart at 13:00 with 250 fare-paying passengers. Two hours prior to departure, an essential component for flight operations fails. The mechanics investigate and conclude that a replacement part is required. An interrogation of available inventory reveals that there is a delivery of the required component in 12 hours time.

The decision is made by maintenance control – the flight must not be delayed. A replacement component is removed from an aircraft that is not scheduled to fly until the next day. The component is inspected and installed in the faulty aircraft. A work order is issued against the donor aircraft to be completed before the flight time, on the next day.

Installing and removing equipment

When completing the work required in a work order, you must remove and install the equipment specified in the work orders.

Installation and removal of equipment:

When performing maintenance work orders, you must install or remove the equipment associated with those work orders. For example, you have to install an equipment when it comes back from maintenance, because the engine that was corrected has to be reinstalled in an airplane.

You can use the **Install/Remove Equipment** action in the Work Order Tracking application or the **Install Equipment** button on the **Materials** subtab of the **Actuals** tab to install an equipment. In both cases, the corresponding build position must be serialized.

The following information applies if you access the Install/Remove window through the **Materials** subtab on the **Actuals** tab:

- On the **Materials** subtab, in the Rotable Equipment field, you can specify a rotable equipment that is also a CM part, which is used as the value for the child equipment.
- On the **Materials** subtab, you can specify a value in the **Actual Date** field to use as the transaction date.
- You can install the child equipment only to a build position that is valid for the CM part associated with the equipment.

To record meter offsets, select the **Record Meter Offsets** check box in the CM Options window in the Organizations application. You access that window through the **CM Options** action in the Organizations application.

Recording meter readings

When you record meter readings for configuration-managed aircraft or equipment, you can record the actual or delta values.

Specifying meter readings:

You can add meter readings to the aircraft or piece of equipment and location that are on a work order. You specify meter readings as either actual or delta values. You can specify meter readings for any date and time starting on the date and time when the aircraft or piece of equipment was created

Before you begin

Before you add meter readings to an aircraft or piece of equipment and location by using the Work Order Tracking application, you must set the initial readings on the related aircraft or piece of equipment.

Procedure

1. In the Work Order Tracking application, on the **List** tab, select a work order record.
2. From the **Select Action** menu, select **Enter Meter Readings**.
3. Select a meter name and a meter reading type.
4. Select a value for count date and time.
5. Specify a meter value.
6. Add a location meter reading and specify any related information.
7. Click **OK** and save the record.

Modifying offsets to meter usage:

You can correct offsets to meter usage. The meter must be related to an aircraft or piece of equipment that you installed or removed.

Procedure

1. In the Work Order Tracking application, select the work order associated with the aircraft or piece of equipment that you want to update.

2. From the **Select Action** menu, select **Install/Remove Equipment**.
3. Select the node that contains the build position that you want to update and click **OK**.
4. If the **Transaction Date** field is empty, specify a value.
5. Update the value in the applicable **Actual Count** field.
6. Click **OK**.

Recording structural damage and repairs

The structural damage and repair record enables aircraft operators to record, review, view, and track all damage that occurs in an aircraft structure to ensure the safety of the aircraft's operations.

Structural damage of an aircraft includes dents, scratches, cracks, and buckles. The damage to an aircraft is typically discovered by a visual inspection but can also be discovered because of impaired flight performance. Each aircraft manufacturer distributes and maintains a structural repair manual (SRM) that details the damage types, limitations, and standard repair plans. Damage that is not covered within the SRM requires a specific repair plan to be created by the manufacturer or their designated design authority. You can record structural damage in the user interface and through an interactive graphical representation of the aircraft in the Aircraft application.

Creating structural damage and repair records by using the graphical interface

You can create a structural damage and repair record to record the details of all damage and repairs that are associated with an aircraft. You can review the existing structural damage of an aircraft by using a graphical representation of the aircraft's structure, and create a new record by using this graphical representation.

Before you begin

In the Models application, in the **More Actions** menu, select **Assign SDR Images** to add airplane graphics that correspond to the aircraft model that you are creating the record for.

Procedure

1. In the Aircraft application, on the **Structural Damage and Repair** tab, in the **SDR List** section, add a **New Row**.
2. On the graphical user interface, select the graphic that corresponds to the area of the damage.
3. Optional: To review the existing damage records on the graphic that link to the details of the damage, select the record from the **SDR List** section.
4. Select the **Arrow** icon to identify the location of the damage on the airplane graphic and zoom into the image by using the scroll wheel. Select the **Target** icon, and to click to place a marker at the position that indicates where the damage occurred.
5. Optional: To change the location of an existing structural damage and repair record, select the existing damage marker on the graphic, and select a new position on the graphic by using the **Target** icon. Confirm the position.
6. Specify the date that the issue was reported, the location of the damage, the description of the damage, whether the damage is internal or external, whether the damage is visible, and the dimensions of the damage.
7. If the damage is caused by corrosion, specify the category of the corrosion.

8. Specify the classification value and the limitation type of the damage.
9. Optional: In the **Related Records** subtab, add reference documents and related records.
10. Save the record.

Creating structural damage and repair records

A structural damage and repair record documents the details of all damage and repairs that are related to an aircraft. You can also add related record and reference documentation to the record.

Procedure

1. In the Aircraft application, on the **Structural Damage and Repair** tab, in the **SDR List** section, select a **New Row** to add a record.
2. Specify values for the registration, serial number, or part number of the aircraft.
3. Specify the date that the issue was reported, the location of the damage, the description of the damage, whether the damage is internal or external, whether the damage is visible, and the dimensions of the damage.
4. If the damage is caused by corrosion, specify the category of the corrosion.
5. Specify the classification value and the limitation type of the damage.
6. Optional: In the **Related Records** subtab, add reference documents and related records.
7. Save the record.

Chapter 7. Defining reference data for models and parts

Before you receive aircraft and equipment, you must create engineering reference data for it. The reference data specifies the configurations that are allowed for parts on build positions on models and how they are maintained. During day-to-day operations, the build data interpreter (BDI) uses the reference data to ensure that any changes to the associated aircraft and equipment are valid.

Configuring parts and part assemblies

To manage your inventory, you define and describe the parts that are available in your storerooms and the configuration-managed parts that are in operational use on aircraft and equipment. You define parts in the Part Number Masters application.

Parts overview

Part records define the kinds of material and equipment that are stocked in your storerooms. Each part is associated with a specific part set and can be shared by the organizations that use the part set. You use the Part Number Master application to create part records.

When you create a part record, you specify what kind of part it is:

Consumable part
Has a unique part number, will not be repaired or refurbished, and is not monitored for maintenance purposes.

Rotable part
Has a generic part number that applies to interchangeable pieces of equipment that are associated with the part. You use the part number to track the movement of a part in and out of storerooms. You use the equipment number to track a specific instance of the part.

Configuration-managed part
A configuration-managed part is a rotable part that is associated with a build position on a model and is under configuration-management control. Any operational changes to the piece of equipment that is associated with the part are validated against the rules defined for the model.

You must specify whether the part is managed as part of a batch. You can configure optional attributes to define how a part is tracked in your inventory. For example, you can assign a commodity code to a part, associate the part with a meter, and specify that a part is condition-enabled. For configuration-managed parts, you can also specify a category for the part and whether the part is software.

The **Part** tab includes sub-tabs that contain the following information:
- The models where the part is applicable. Configuration-managed parts are associated with at least one model. You can associate consumable parts with build items but these parts are not under configuration-management.
- Alternate parts that can be used as a substitute for a part, for example different brands of engine oil.
- Condition codes that apply to condition-enabled parts.

- For configuration-managed parts, associated master task cards and information about serial ranges.

Additional tabs and actions are available where you specify associated records for the part, such as inventory, price book, and vendor records.

Related tasks:

"Defining parts" on page 109
When you create a part, you specify initial attributes and then you can configure additional information, such as constructing part assemblies, adding parts to storerooms, associating parts with vendors, and specifying classifications for parts.

Part assemblies

Part assemblies organize child parts and part subassemblies to define more complex parts, such as motors or engines. Consumable parts must be kit-enabled to add them to part assemblies. All rotable parts can be added to part assemblies.

Part assemblies enable you to construct and manage complex sets of parts in a hierarchical manner. The selected part in the Part Number Master application is set as the parent part and you add other parts and part assemblies as child parts. The part number of the parent part becomes the identifier for the composite part assembly.

The following considerations and restrictions apply to part assemblies:
- If the parent part is rotable, child parts in the part assembly can be either rotable or consumable.
- If the parent part is consumable, the parent part must be kit-enabled and all child parts must be consumable.
- If a rotable part is applied to a part assembly, child rotable parts become part of the parent rotable part and do not have their own inventory balance.
- If a part assembly is for a kit, it cannot include rotable parts or condition-enabled parts.

You can copy a part assembly structure.

Part master statuses

You can manage the status of a part for all related records. A set of inheritance rules are used to apply changes to a part from a higher level to a lower level. A change to the part status is applied to the organization and to the inventory level. From the organization level, a status change is applied to the inventory level.

The following status types are available:
- Pending parts are not available when you attempt to record selected general ledger transactions. Parts that are in Pending status are not visible from part lookups. This status applies to the following general ledger transactions:
  - Material Use Transactions (MATUSETRANS)
  - Material Receipts Transactions (MATRECTRANS)
  - Inventory Transactions (INVTRANS) except for Insert Part (INSERTITEM)
- Planning parts are not available when you attempt to record selected general ledger transactions. This status applies to the following general ledger transactions:
  - MATUSETRANS
  - MATRECTRANS (Issue, Transfer, or Receipt types, only)

- Active parts are available without any restrictions.
- Pending Obsolescence parts can be used, but cannot replenish existing balances.
- Obsolete parts cannot be used in the system, except to generate invoices and for historical purposes. Parts that are in Obsolete status are not visible when you are looking up parts.

Stock category types

There are three stock category types: non-stocked (NS) parts, special order (SP) parts, and stocked (STK) parts. Using stock category types helps you identify parts for reorder and minimizes administration work when ordering occasionally used parts.

Non-stocked (NS) parts
> Parts that you do not stock on a regular basis, and that are not automatically reordered. Because a part is sometimes needed, retain the record for the part in the database. The record for the part is useful both for cost tracking purposes and for future reference. For example, the record contains the vendor's name, the price, or other pertinent part-specific information. A non-stocked part can include a part that is needed once a year for inspections, or a part that is stocked during certain seasons of the year. For example, air filters must be replaced once a year. You can keep the record of the part in your database for future replacements.

Special order (SP) parts
> Parts that you order only once, for an unexpected need or for a one-time work order. A special order part is not kept in stock. You do not need a permanent record of the part in your database. In most cases, after the part is received, you can delete the record for the special order part from the database.

Stocked (STK) parts
> Parts that you stock continually because they are frequently needed. A stocked part is the default value for a part added to a storeroom. Stocked parts are included in the reorder process. Stocked parts have a reorder criteria (for example, a reorder point and an economic order quantity) that is specific to each storeroom location.

Meters

You can create meters and associate meters with parts. The associated aircraft, equipment, or location record is updated with the quantity that was issued and decreases the storeroom balance of that part.

When you associate a meter with a part and issue the part to a work order, aircraft, piece of equipment, or location, the associated aircraft, equipment, or location record is updated with the quantity that was issued, and the storeroom balance of that part decreases. This occurs only when the meter on the part matches the meter on the aircraft, piece of equipment, or location.

Meters can be of the following types:
- Continuous, such as gallons to date or running time meters.
- Gauge, such as temperature readings.
- Characteristic, such as a color or a vibration level.

Example of a continuous meter

You can track fuel consumption for an aircraft or a piece of equipment. Define FUEL as a meter and GASOLINE as a part. Use the Part Master application to associate the meter FUEL with the part GASOLINE. When you issue fuel for an aircraft or a piece of equipment, the balance of the fuel in the storeroom is decreased by the amount issued. Use the **Meters** tab in the Aircraft or Equipment applications to see that the amount of fuel issued to the aircraft or piece of equipment increases by the amount specified.

Meter groups

A meter group is a set of meters that you can apply to an equipment record. Any meter group that is associated with the rotable part is automatically applied to any items of equipment that are created for that part.

Example of a meter group

A pump is a rotable part. On a pump, meters might track inlet pressure, outlet pressure, and vibrations. Meters are common to all pumps that share a part number. Instead of having to add these meters to each equipment record created for a rotable part, create a meter group with this collection of pump-related meters and associate it with the rotable part. Each time you create an equipment record for the pump, the meter group, and its meters are automatically associated with the equipment record.

Tax-exempt status

The tax-exempt option indicates whether a part, a tool, or a service is taxable. You might want to set the tax-exempt status, depending on where a part or a service is acquired, and how a part or a service is used.

The situations under which parts or services are tax-exempt vary depending upon your location, and upon current tax regulations. For example, the storeroom for a part might be in a location where sales taxes are not collected. In some cases, if a part becomes part of a product, that part can be tax-exempt. If the part is used as a stand-alone part, then the part is taxable. The buyer for your organization determines the tax-exempt status of parts, of tools, and of services.

You can override the tax-exempt status for parts, for tools, and for services in the following applications:
• Purchase Requisitions
• Purchase Orders
• Invoices

When you specify the tax-exempt status, you can apply the status at the organization level and at the vendor level.

Consignment parts

Consignment parts are owned by external vendors. The consignment parts are located in a local storeroom, and are considered part of the consignment inventory. You can keep consignment parts in your storeroom, and pay for those types of parts when you use them.

When you create a part, you can specify the part as a consignment part. Rotable parts and condition-enabled parts cannot be flagged as consignment parts.

Invoices for consignment parts are generated in any of the following ways:

Consumption
>An invoice is generated automatically when the part is consumed from the storeroom.

Frequency
>If invoices are based on a frequency, then the product-provided cron task (FREQCONSINV) evaluates consignment parts to be processed. The frequency and units specified for the inventory record are used to determine the next invoice date. The cron task is set to run daily, unless you specify another value. A single invoice that contains up to the maximum number of lines is created for each vendor. You use the Organizations application to set the maximum number of lines on consignment invoices.

Manual
>You generate an invoice manually.

Defining parts

When you create a part, you specify initial attributes and then you can configure additional information, such as constructing part assemblies, adding parts to storerooms, associating parts with vendors, and specifying classifications for parts.

Procedure

1. In the Part Number Masters application, create a part.
2. To group related parts that can be tracked as a single unit, create part assemblies.
3. Add parts to the inventory for a storeroom in the **Storerooms** tab. Configure account balance information for parts in the storeroom in the Inventory application..
4. Add classification information for a part in the **Specifications** tab. Configure classifications in the Classifications application.
5. Specify vendors that supply a part in the **Vendors** tab and use the **View Contracts** action to review contracts for vendors. Configure vendors in the Companies application.
6. Specify price book information for parts that are supplied to customers in the Price Books tab. Configure price books in the Price Books application.
7. Use the **View Warranties** action or the **View Issued Parts under Warranty** action to review warranty information for parts. You create warranty records in the Part Warranty Contracts application.

Creating parts

When you create part records in the Part Number Master application, you specify if a part is consumable, rotable, or configuration-managed, and whether the part belongs to a batch. You configure additional attributes to meet your requirements, for example to associate a part with a commodity code, a meter, or condition codes.

Procedure

1. In the Part Number Master application, click **New Part**.
2. Specify a value in the **Part** field.
3. In the **Batch Type** field, specify whether the part is tracked as part of a batch.

4. Select the appropriate check box to specify whether the part is rotable, configuration-managed, or consumable.
5. Optional: Specify additional values as required.
6. Save the part.
7. Optional: If you want to define an alternate part, in the **Alternate Parts** subtab, click **New Row** to specify the alternate part to use in place of this part.

Creating part assemblies

A part assembly is a hierarchical structure of parts and part subassemblies that can be issued from your inventory as a single part.

Procedure

1. In the Part Number Master application, select the part that is to be the parent part for the part assembly.
2. In the **Part Assembly Structure** tab, click **New Row**.
3. In the Children window, specify the part number and optionally, change the quantity, and add remarks..
4. Add more child parts or part assemblies as required.
5. Save the part.

What to do next

A part assemby structure can have many levels of nested part assemblies. You can traverse the hierarchy and view nested part assemblies by using the **Move To** action to change the **Current Level** part.

Creating part kits:

A part kit is a group of parts that are issued as a single unit. You assemble a part kit and add it to a storeroom as one package of parts that carries with it the required costing and balance information. You can define the parts that comprise a kit.

Procedure
1. On the toolbar of the Part Master application, click **New Part**.
2. On the **Part** tab, specify a value, and type a description.
3. Select the **Kit** check box to indicate that this part is a kit.
4. Enter additional fields as needed. An asterisk (*) indicates a required field.
5. To add parts to the kit, from the **Part Assembly Structure** tab, click **New Row** to open the Children window.
6. In the **Part** field, type a value. You can only add parts that are not condition-enabled, rotating, or batched.
7. Optional: Change the number in the **Quantity** field.
8. Optional: Type remarks for this part in the **Remarks** field.
9. Optional: Click **New Row** to add another part.
10. Click **Save Part** to add the new part record to the database.

Adding parts to models

When you create a model, a default build item and a configuration-managed part are created. You can add more build items to a model and add parts and part assemblies to build items. You then associate the parts with build positions on the model.

Procedure

1. In the Models application, create a model and specify mandatory and optional values. An initial build item and part number are automatically created. The build item ID and the part number are the same as the model ID.

2. To add more build items to the model, in the Build Items section, click **New Row** and define the build item. A matching part number is created for each build item that you create.

3. To add more parts to a build item, select the build item and, in the Parts section, click **New Row** and define the part.

4. In the **Build Hierarchy and Position Rules** tab, in the **Build Hierarchy** subtab, add build items and their associated part numbers to appropriate positions on the build hierarchy.

5. In the **Position** subtab, configure the build positions.

6. Save the model.

Related information:

Configuring build positions

Adding parts to storerooms

You can add a part to the inventory for a storeroom. An inventory record is created when you add a part to a storeroom.

About this task

To track the balance for the part, specify the unit of measure used for issuing the part. When you add a part to a storeroom, the inventory control account, the shrinkage cost account, and the inventory cost adjustment account default to the values specified in the storeroom record. In the case of consignment parts, the account values specified in the company record for the consignment vendor are used. Use the Inventory application to show these account fields and to edit them on the inventory record so that you can make the accounts specific to a part and to a location.

Procedure

1. In the Part Number Master application, select a part and open the **Storerooms** tab.

2. Select the **Add Parts to Storeroom** action.

3. Optional: Change the **Site** for the storeroom. The **Site** field displays the default insert site. If you change the site, the value in the **Storeroom** field clears, allowing you to select a storeroom for the site you specified.

4. In the **Storeroom** field, specify a value.

5. Click **OK** to open a second Add Parts to Storeroom window.

6. Optional: Specify a default bin, a standard cost, and an order unit for the part.

7. In the **Issue Unit** field, type a value or click **Select Value** to retrieve the unit of measure that you want to use for the part. Examples of possible issue units include EACH, MHZ, or ROLL.

8. Optional: If the part is a consignment type of part, expand the Details section for the part, and select the **Consignment** check box.

   a. In the **Consignment Vendor** field, specify the company that provides the part, and for which invoices are generated.

   b. In the **Invoice Generation Type** field, specify the type of invoice to be generated. If you select FREQUENCY as the invoice type, specify a value for the frequency, and a value for the frequency units. If values for the

frequency and frequency units are specified, the next invoice date defaults to the current date and time. You can select a different date for the next invoice date.

c. Optional: Fill out other fields as needed.

9. Click **OK**.

Associating parts with vendors

You can associate vendors with parts to manage a list of vendors that supply a part.

Before you begin

Create vendors using the Companies application, and store vendors at the organization level. The list of available vendors is filtered to show only those vendors that are created for the organization and the company set to which you belong. Create a list that includes vendors from whom you have already ordered, as well as vendors that you have not used. You can then use the historical vendor data to compare vendor prices and delivery information.

About this task

You can specify whether a vendor is the default vendor for the part in the organization. You can change the vendor on the work plan or the requisition. Each part in an organization can have one default vendor. You can also specify whether a part is tax-exempt.

Procedure

1. In the Part Number Master application, select a part and click the **Vendors** tab.
2. In the Vendors window, click **New Row**.
3. In the **Vendor** field, type a value.
4. In the **Promised Lead Time (Days)** field, specify the number of days it takes the vendor to supply the part.
5. Enter additional fields as needed. An asterisk (*) indicates a required field.
6. Optional: Select the **Default Vendor** check box if the vendor is the default vendor for this part. If you select the **Default Vendor** check box, when you add the part to a work plan as a direct issue part or create a requisition for the part, the information for the default vendor and details about the part (such as make, model, catalog code, and unit cost) are copied to the requisition.
7. Optional: Select the **Tax Exempt** check box if you want the part to be tax-exempt.
8. Optional: Click **New Row** to specify additional vendors.
9. Click **Save Part** to associate the vendors to the part record.

Viewing contracts:

You can view the contracts that are associated with a part.

Procedure

1. From the **List** tab of the Part Master application, display the part record whose contracts you want to view.
2. On the **Vendors** tab, select the **View Contracts** action.

3. Use the **Filter** area to narrow the list of contracts that you want to display in the table. For example, specify a contract number, a contract type, or a status and then click **Filter Table**.

4. Click **OK** when you are done viewing the contracts.

Adding specifications to parts

You can add specifications that define a part.

About this task

Use the **Specifications** tab to classify a part and to apply the template that is associated with the classification you used. Specification templates contain attributes about a part, such as the size, the speed, the material, and the capacity. Use this list of attributes to define specific information about a part, making it easier to distinguish a part from a similar part.

Procedure

1. In the Part Number Master application, select a part and open the **Specifications** tab.

2. In the **Classification** field, click **Detail Menu** and then **Classify** to select a classification path for the part.

3. In the **Alphanumeric** field or in the **Numeric** field, type a value.

4. In the **Unit of Measure** field, type a value or click **Select Value** to retrieve the unit of measure used to express the attribute. For example, if the attribute is SPEED, the unit of measure can be HP (horsepower).

5. Click **Save Part** to associate the specification values with the record for the part. If you need to change the specifications for a part, either reclassify the part using the **Classification** field or change the values in the **Specifications** table.

Specifying organization details for parts

You can specify organization details for parts. You can group parts in part sets, and multiple organizations can use the part sets. The safety hazards and tax codes that you apply to a part are specific to a single organization. You can also specify the tax-exempt status for the part at the organization level.

Before you begin

After creating a part, use the Part Number Master application to add, to view, to modify, or to delete the information that applies to an organization.

Procedure

1. In the Part Number Master application, select a part.

2. Click the **Part/Organization Details** action.

3. In the Parts/Organization Details window, select the organization to which you want to add organizational details.

4. Optional: Add a safety hazard.

5. Optional: Add a tax code.

6. Optional: Specify whether the part is tax-exempt.

7. Optional: Modify the percentage of parts that can be received over the quantity ordered. The receipt tolerance percentage value was set when the part record was created.

8. Click **OK** and click **Save Part**.

Chapter 8. Applying reference data to operational aircraft and equipment

Configuration-managed aircraft and equipment are the physical representation of the models and parts that you define in the reference data. You can validate changes to the status of the aircraft or equipment based on the configuration rules and the reference data that is specified in the associated model.

Aircraft and equipment overview

An aircraft record contains the registration and manufacturer's serial number (MSN) for an aircraft, is associated with a model, and includes information about the equipment on the aircraft. Equipment records contain information about the equipment on an aircraft and any other equipment that your organization wants to manage. You create aircraft assemblies and equipment assemblies to organize the required pieces of equipment in a hierarchy.

You associate aircraft records and the parent records of equipment assemblies with models. The configuration-management rules that are defined for the model are then applied to the aircraft and equipment assemblies.

A piece of equipment is either rotable or nonrotable. All configuration-managed equipment is rotable. A piece of rotable equipment has an equipment number and an associated part number that is tracked in inventory. You can create records for pieces of equipment that are not rotable, for example, to record information about a piece of ground support equipment that is not installed on an aircraft.

When you create an assembly, you can set an aircraft as the parent record, or you can set a piece of equipment as the parent record, for example, to create an equipment assembly for an aircraft engine. An aircraft record can contain multiple equipment assemblies and individual pieces of equipment. The parent record of an equipment assembly can contain multiple subassemblies and individual pieces of equipment.

An aircraft contains thousands of pieces of equipment and manually creating, configuring, and organizing these records is time-consuming and error-prone. You can create a virtual aircraft or piece of equipment based on an existing model, aircraft, or piece of equipment. You can associate meters with equipment based on the associated model, add initial meter readings, and then generate aircraft and equipment records.

Use the New Aircraft and Equipment Receiving application to receive aircraft and equipment that have current purchase orders. Use the New Aircraft and Equipment application to create records for existing aircraft and equipment where receipt of purchase is not required.

After you generate the records for an aircraft or piece of equipment, you can see the hierarchy of equipment that was created in the Aircraft application or in the Equipment application. You can drill down in the hierarchy to view individual pieces of equipment. You can right-click a node in the hierarchy to see meter counts, current and historical maintenance information, and the installation history

for the aircraft or piece of equipment. You can also right-click a node in the hierarchy to install or remove a piece of equipment, change a part number or serial number, and view a history of changes.

You can associate aircraft and equipment records with warranties, meters, safety records, and audits and surveys. You can view associated work orders and specify work zones where labor and crew are assigned. You can configure customer billing meters and record the usage of aircraft and equipment that you maintain for customers.

In an aircraft record, you can view the modification status of associated technical publications. You can record and track structural damage and repairs and monitor the weight and balance of the aircraft. You can also view any OMPs that are associated with the aircraft.

Related concepts:

"Aircraft application" on page 226
You use the Aircraft application to track physical aircraft and to store aircraft numbers and corresponding information, such as parent, location, vendor, status, and maintenance costs. You can build the aircraft hierarchy as an arrangement of aircraft, pieces of equipment, and subassemblies. The aircraft hierarchy provides a convenient way to roll up maintenance costs so that you can check accumulated costs at any level, at any time.

"Equipment application" on page 227
In the Equipment application, you can associate a piece of equipment with a location, and record additional information, such as aircraft operator, vendor, and purchase order. You can record and track equipment downtime and you can track the maintenance costs that are recorded on associated work orders. The accumulated costs are rolled up in an equipment assembly. In the Equipment Breakdown tab, you can select a node to view the rolled-up costs at that level of the hierarchy.

Configuration management of aircraft and equipment

When you associate an aircraft or equipment record with a configuration of a model, the configuration-management rules that are defined for the model are applied when the aircraft or equipment is operational.

An aircraft record specifies an associated model and you install equipment assemblies, subassemblies, and individual pieces of equipment in build positions on the associated model. The configuration rules that are defined for a build position are applied to the equipment that is installed in the build position. For an equipment assembly, the parent equipment record is associated with a model and you install equipment in build positions on the model.

Build positions on models are either serialized or nonserialized. Serialized build positions are configuration-managed. When you install a piece of rotable equipment in a serialized build position on a model, the configuration rules that are defined for it are applied to the piece of equipment. You can install a part that does not have an associated equipment record in a nonserialized build position. A nonserialized build position records the quantity of parts in a particular position. A nonserialized build position can have associated configuration rules that apply to parts that are installed in that position.

When an aircraft is operational, the build data interpreter (BDI) service validates the status of the aircraft and equipment against the associated rules for the model

configuration. In the Aircraft application and Equipment application, color-coding is used to indicate the BDI status for each record.

You can view the BDI status for a record and convert a record to apply an alternative configuration of a model by using the **BDI Status** action. Some validation requests are placed in a queue for background processing. You can view the status of the queue in the BDI Queue Status application.

Creating and maintaining aircraft and equipment records

To prepare aircraft and equipment for operational use, you create aircraft and equipment records. You associate an aircraft record with a model, and you install equipment in build positions on a model. You also configure meters and safety information for aircraft and equipment records.

Creating aircraft records

You create an aircraft record in the Aircraft application and associate it with a model that specifies the rules that apply when the aircraft is operational.

Procedure

1. In the Aircraft application, click **New Aircraft**.
2. Specify the registration number and MSN value and a corresponding part number for the aircraft.
3. Specify a model and the configuration and revision of the model.
4. Specify the initial reading event when meters commence.
5. Optional: In the subtabs on the aircraft record, specify additional details about the aircraft and record purchase information.
6. In the **Meters** tab, assign meters to the aircraft.
7. In the **Warranties** tab, associate the aircraft with warranties.
8. Optional: In the **Safety** tab, configure safety records.
9. Optional: In the **Specifications** tab, specify classification details.
10. Save the record.

Related concepts:

"Aircraft application" on page 226
You use the Aircraft application to track physical aircraft and to store aircraft numbers and corresponding information, such as parent, location, vendor, status, and maintenance costs. You can build the aircraft hierarchy as an arrangement of aircraft, pieces of equipment, and subassemblies. The aircraft hierarchy provides a convenient way to roll up maintenance costs so that you can check accumulated costs at any level, at any time.

Creating equipment records

You create equipment records in the Equipment application. Large pieces of equipment, such as aircraft engines, are typically associated with models. Smaller pieces of equipment are typically installed on the model that is associated with a parent aircraft or equipment record.

Procedure

1. In the Equipment application, click **New Equipment**.
2. Specify an equipment number and a part number.

3. If the piece of equipment has its own corresponding model, specify a model, configuration, and revision.
4. Specify the initial reading event when meters commence.
5. Optional: In the subtabs on the equipment record, specify additional details about the equipment and record purchase information.
6. In the **Meters** tab, assign meters to the equipment.
7. In the **Warranties** tab, associate the equipment with warranties.
8. Optional: In the **Safety** tab, configure safety records.
9. Optional: In the **Specifications** tab, specify classification details.
10. Save the record.

Related concepts:

"Equipment application" on page 227
In the Equipment application, you can associate a piece of equipment with a location, and record additional information, such as aircraft operator, vendor, and purchase order. You can record and track equipment downtime and you can track the maintenance costs that are recorded on associated work orders. The accumulated costs are rolled up in an equipment assembly. In the Equipment Breakdown tab, you can select a node to view the rolled-up costs at that level of the hierarchy.

Installing equipment in build positions

You install equipment in serialized build positions on a model to bring the equipment under configuration-management. You can install spare parts that do not have an associated equipment record in nonserialized build positions on a model. Nonserialized build positions can be configuration-managed.

About this task

In the **Aircraft Hierarchy** tab or the **Equipment Hierarchy** tab, non-serialized build positions are identified in pink in the hierarchy. For example, a fuel pump mounting is a tracked piece of equipment that has a serial number. The 12 bolts that secure the pump to the structure are vital to the integrity of the equipment but they are not tracked as serialized parts. The 12 bolts are defined as a nonserialized position with a maximum quantity of 12 and a minimum quantity of 12. When the piece of equipment is validated, the quantity of bolts installed is evaluated.

Procedure

1. In the Aircraft application or the Equipment application, select the parent record that is associated with a model and open the **Aircraft Hierarchy** tab or the **Equipment Hierarchy** tab.
2. In the **As Of Date** field, enter the date on which you want to install the piece of equipment.
3. Right-click the node that contains the build position to which you want to install a piece of equipment, select **Install/Remove**, and specify the piece of equipment.
4. Optional: To install a piece of consumable equipment, right-click a node that is highlighted in pink and select **Non-Serialized Build Position**.
5. Optional: Specify the associated work order and end item count.
6. Save the record.

Tracking aircraft and equipment usage by using meters

Aircraft and equipment meters can record flying hours, flight cycles, miles traveled, or engine starts. You can assign meters and meter groups to parts, aircraft, and equipment.

Aircraft and equipment meters

Aircraft and equipment meters can record flying hours, flight cycles, miles traveled, or engine starts. You can assign meters and meter groups to parts, aircraft, and equipment.

When you specify the part number on an aircraft or equipment record, if a meter group is assigned to the part, the assignment is copied to the record. You can view but you cannot change the meters in the assigned meter group in the **Meters** tab of the Aircraft application or Equipment application.

If a meter group is not assigned to the associated part, you can assign a meter group to an aircraft record or an equipment record. You can view and change the meters in this meter group in the **Meters** tab of the Aircraft application or Equipment application.

You can also assign meters and meter groups to pieces of consumable equipment in the **Meters** tab of the Equipment application.

Two types of meter readings are used to track usage for aircraft and equipment:
- An actual or hard count reading records the current meter value.
- A delta or soft count reading records the difference between the last meter reading and the current meter reading.

You create and maintain Meters and Meter Groups in the Meters and Meter Groups applications.

You can enter and update meter readings in the Aircraft application or the Equipment application. You can add and change actual and delta count readings for a piece of equipment by selecting the meter in the **Meters** tab, or by selecting the node in the **Aircraft Breakdown** tab or the **Equipment Breakdown** tab, and specifying the meter to update.

Meter life offsets affect the calculation of meters and can result in different meter readings. Meter life offsets are the end item count at installation and the end item count at removal. You can edit the meter life offset values for an equipment record by right-clicking the node in the **Aircraft Breakdown** or **Equipment Breakdown** tab, and selecting the **Edit Life Offsets** option.

You can use the **Reset/Replace Meter** action to reset meters, for example following the repair or inspection of a piece of equipment, and you can replace meters, for example if a meter is broken.

Associating meters and meter groups with aircraft or equipment

You can associate a meter group and meters with an aircraft or equipment record. An aircraft or equipment record can be associated with one meter group that contains multiple meters. You can associate additional individual meters with a record.

About this task

If an aircraft or equipment record is associated with a part that has a meter group assigned to it, the meter group also applies to the aircraft or equipment record and the **Meter Group** field is read-only. You can see a list of the meters in the meter group but you cannot change them.

If the associated part on an aircraft or equipment record does not have a meter group assigned to it, you can assign a meter group to the record. You can change the value in the **Meter Group** field and you can add and delete meters from the list.

You can also assign a meter group to a piece of consumable equipment.

Procedure
1. In the Aircraft application or the Equipment application, open the record to which you want to add a meter.
2. On the **Meters** tab, click **New Row**.
3. In the **Meter** field, specify a meter.
4. If you specify a continuous type of meter, specify one of the following options for the **Average Calculation Method**:

Option	Description
All	All readings are used to calculate the average meter reading.
Sliding Days	Average meter readings are calculated over a specific number of days. You enter the number of days to use in the **Sliding Window Size** field.
Sliding Readings	Average meter readings are calculated over a specific number of readings. You enter the number of readings to use in the **Sliding Window Size** field.
Static	Average meter readings are not recalculated. You specify the static value in the **Average Units/Day** field.

5. For a continuous type of meter, in the **Reading Type** field, specify **Delta** to report incremental use or **Actual** to report cumulative use.
6. For a continuous type of meter, in the **Accept Rolldown From** field, specify whether the record accepts meter readings from a parent aircraft, equipment, or location record.
7. Save the record.

Specifying meter readings
You use the Aircraft application or the Equipment application to report meter readings for a selected aircraft or piece of equipment.

Before you begin

You might need to acquire the proper authorization to specify historical readings.

About this task

A historical reading has a **New Reading Date** that is before the last reading date.

Procedure

1. On the **Meters** tab of the Aircraft application or the Equipment application, display the aircraft or piece of equipment for which you want to type meter readings.
2. Select the **Enter Meter Readings** action.
3. In the **New Reading** field for the meter, specify a value. The **Average Units/Day** field value is calculated.
4. If you are entering a delta reading, select the **Delta** check box. If the meter was set up as a delta reading type, the check box is selected by default. If you are specifying an actual reading that is a rollover reading, select the **Rollover** check box. In a rollover reading, the new reading value is less than the **Previous Reading** value due to a rollover.
5. To view the details for the meter, click **View Details**.
6. Optional: Edit the date and time in the **New Reading Date** field.
7. Optional: Type a comment about the reading in the **Remarks** field.
8. Click **OK** to save the specified readings and close the dialog box.

Updating meter readings for aircraft and equipment

To maintain accurate records and update any incorrect meter readings, you can retrospectively change initial or direct meter readings for aircraft or equipment.

Procedure

1. In the Aircraft application or Equipment application, open a record in the **Aircraft Breakdown** or **Equipment Breakdown**tab.
2. In the **As Of Date** field, specify the current date or a past date. The hierarchy is refreshed to show the hierarchy that existed on the date that you specified.
3. Click the node that you want to update.
4. Click the type of meter you want to update.
5. In either the **Initial** subtab or **Direct** subtab, add a meter reading or change the date of the meter reading.
6. Save the record.

Updating meter reading history

Use the **Manage Meter Reading History** action in the Aircraft application or the Equipment application to view or to update historical meter readings.

Before you begin

Depending on your security authorization, you might be able to only view historical readings and not to update them.

About this task

When you update a meter reading, the delta count readings are applied to all the readings for that meter that are more recent than the date on which you make the update. Subsequent meter readings are updated until the first actual reading is reached. A historical reading can be greater than a subsequent reading only if the meter has a rollover point.

If the meter is on an aircraft or piece of equipment that is organized in a hierarchy, the readings are also updated for equipment records that were members of the hierarchy at the time of the original meter reading and are configured to inherit meter readings from the parent record. The readings for meters on equipment that was added to the hierarchy after the original meter reading remain unchanged. If the meter is for a location that has aircraft or equipment set up to accept the roll down of readings from their locations, the meters for those aircraft and equipment records are updated.

When you change a reading, the modified date, the user, and a reason for the change is recorded.

Procedure
1. In the Aircraft application or the Equipment application, open a record and select the **Manage Meter Reading History** action.
2. Click the **Continuous Meter Readings** tab or the **Characteristic and Gauge Meter Readings** tab to view and update meters based on their meter types.
3. On the **Continuous Meter Readings** tab, you can enter the modified reading when the **Enter as Delta** check box is not selected. Select the **Enter as Delta** check box to specify a delta for the selected meter.
4. Specify the updated meter readings and click **OK**.

Resetting and replacing meters
You can clear the readings for a continuous type of meter, for example to start the count again after a piece of equipment is repaired. You can also replace meters, for example to install a new meter after a meter is broken.

Procedure
1. In the Aircraft application or the Equipment application, open a record and select the **Reset/Replace Meters** action.
2. Click **View Details** to view information for the selected meter.
3. To reset a meter, specify values as needed in the **Since Last Repair** field, the **Since Last Overhaul** field, the **Since Last Inspection** field, the **Since Install** field, the **Rollover** field, and the **Average** field.
4. To replace a meter, in the **Last Reading** field, specify a value.
5. Click **OK**.

Associating safety information with aircraft and equipment
You can associate safety information, such as tag-out procedures, hazards, and hazardous materials lists with an aircraft or piece of equipment.

Associating tag out procedures with aircraft or equipment
You use the Aircraft application or the Equipment application to associate tag out procedures with aircraft or pieces of equipment. A tag out procedure is a detailed description of how to take aircraft or equipment out of service or how to place them back into service, to ensure a safe working environment.

Before you begin

Before you can associate a tag out procedure with an aircraft or piece of equipment, the tag out procedures must be associated with a hazard in the Safety Hazards application.

Procedure

1. From the Aircraft application or the Equipment application, display the aircraft or equipment record that you want to associate with a tag out procedure.
2. On the **Safety** tab, click the **Lock Out/Tag Out** subtab.
3. Under the Hazards table window, click **New Row**.
4. In the **Hazard** field, specify a value.
5. In the Hazards table window, select the hazard for which you want to add a tag out procedure.
6. Under the Tag Out Procedures table window, click **New Row**.
7. In the **Tag Out** field, specify a value.
8. Save the record.

Associating hazards with aircraft or equipment

You use the Aircraft application or the Equipment application to add hazards to aircraft or equipment and to location records. When you build safety plans using the Safety Plans application and use those safety plans on work orders, the hazards that are associated with specific equipment and locations are included on the work order.

Before you begin

Before you can add a hazard to an aircraft or equipment record, the hazard must have been defined using the Safety Hazards application.

Procedure

1. On the **Safety** tab of the Aircraft application or the Equipment application, click the **Hazards and Precautions** sub tab.
2. Under the Hazards table window, click **New Row**.
3. In the **Hazard** field, specify a hazard.
4. Save the record.

Associating hazardous materials with aircraft or equipment

You use the Aircraft application or the Equipment application to add hazardous materials to aircraft or equipment records and to location records. When you build safety plans in the Safety Plan application and then use those safety plans in work orders, the hazardous materials that are associated with specific aircraft or equipment and locations are included on the work order.

Procedure

1. From the Aircraft application or the Equipment application, display the aircraft or equipment record with which you want to associate hazardous material.
2. On the **Safety** tab, click the **Hazardous Materials** subtab.
3. Under the Hazardous Materials table window, click **New Row**.
4. In the **Hazard** field, type a value.
5. Save the record.

Associating safety-related issues with aircraft or equipment

You use the Aircraft application or the Equipment application to associate issues of safety that workers need to be aware of when they perform work on a selected aircraft or piece of equipment.

About this task

If the aircraft or equipment record has hazards or has tag outs associated with it, be sure to associate the record with itself. Doing so makes the safety-related information available when creating a safety plan or a job card for that aircraft or piece of equipment.

Procedure

1. From the Aircraft application or the Equipment application, display the aircraft or equipment record with which you want to associate a safety-related aircraft or piece of equipment.
2. On the **Safety** tab, click the **Safety-Related Equipment** subtab.
3. Under the Safety-Related Equipment table window, click **New Row**.
4. In the **Aircraft or Equipment** field or in the **Location** field, type a value.
5. Repeat steps 3 - 4 for each aircraft or piece of equipment that you want to associate with the current record. If the current aircraft or equipment record has hazards or tag outs associated with it, be sure to add its aircraft or equipment identifier to the Safety-Related Equipment table window.
6. Click **Save Aircraft** or **Save Equipment**.

Issuing parts from a storeroom

You can use the Equipment application to issue associated parts to a storeroom or to return parts from a storeroom. You can issue both rotable and consumable parts, and you can issue parts from different storerooms.

Procedure

1. In the Equipment application, select the record for which you want to issue parts.
2. Select the **Issue Part Numbers from Storeroom** action.
3. In the Issue Parts from Storeroom window, specify a default storeroom or a storeroom site from which to issue parts.
4. In the Associated Parts table window, click **New Row**.
5. In the **Part** field, specify the part you want to issue.
6. In the **Storeroom** field, specify a storeroom.
7. In the **Quantity** field, type the number of parts that you want to issue.
8. In the **Transaction Type** field, select **ISSUE** if you are issuing the part from a storeroom, or **RETURN**, if you are returning the part to a storeroom.
9. Optional: Specify other values as needed:
   a. Depending on the part, you might be able to specify a bin, a batch, a work order, and other values.
   b. If you use general ledger accounts, specify them fully.
10. Click **OK**.

Generating initial records for aircraft and equipment

Aircraft and equipment assemblies can have thousands of component records that must be created before they can become operational. You can automate the creation of these records and specify initial meter readings, based on the structure of an existing model, aircraft, or equipment assembly.

You can generate component records for new and existing aircraft and equipment assemblies. You use the New Aircraft and Equipment - Receiving application to generate records for the receipt of aircraft and equipment that have associated purchase orders. You use the New Aircraft and Equipment application to generate records for aircraft and equipment that are already in stock and are not associated with purchase orders.

Related information:

New Aircraft and Equipment application

New Aircraft and Equipment - Receiving application

Chapter 9. Maintaining aircraft by using flight log books

Similar to paper-based log books, flight log books provide an electronic record of flight information and maintenance operations for aircraft and aircraft training devices. When maintenance is required, you can log discrepancies and corrective actions.

Flight log books

A flight log book holds information for one aircraft only. During the lifecycle of the aircraft, the same flight log book is used to record and maintain information about that specific aircraft. The flight log book includes information about the aircraft and its flight data, discrepancies, maintenance, and personnel.

Flight log book setup records

Flight log books are used by the defense and commercial aircraft sectors to report aviation quality and maintenance. The number of engines, fuel tanks, and replenishment types for an aircraft can vary. To accommodate these variations, you create flight log book setup records that are used as templates to report your type of aircraft maintenance.

A flight log book setup record is a template for the specified model and variation. For example, you create a flight log book setup record for the x_jet model. This fighter jet has two engines, three fuel tanks, and two types of munitions. A flight log book that is created for an x_jet aircraft automatically shows and collects data for the two engines, three fuel tanks, and two types of munitions. If you do not specify a variation, then the flight log book setup record applies to all variations of the model.

Flight log book records

Flight log books provide an intuitive way for pilots, mechanics, and flight engineers to view and record data that is related to aircraft serviceability. When flight log books are in the active status, you can add flight data records to document information about flight data, personnel, replenishments, and munitions.

A flight log book tracks an aircraft through its lifecycle by displaying and collecting information that is related to the following statuses:

Flight log book status
Indicates that status of the flight log book record, such as draft, active, inactive, or locked. When you create a flight log book, it is in the draft status. You cannot add flight data records until you change the status of the flight log book to active. The status of the flight log book is not linked to the serviceability of the aircraft.

Aircraft status
Indicates the current condition of the aircraft, such as grounded, limited release to service, or released to service. The aircraft status is directly linked to open discrepancies. Only one aircraft status is associated with each flight log book record.

Discrepancy status

Indicates whether faults exist that affect the serviceability of the aircraft. If there are multiple discrepancy records, the one with the most severe status is linked to the aircraft status. For example, a flight log book has two discrepancy records. One discrepancy relates to a broken light, and the aircraft is allowed to fly under certain conditions. The other discrepancy relates to a crack in the fuselage, which requires immediate attention. Because of the severity of the second discrepancy, the status of the aircraft is grounded.

Deferral status

Indicates the status of a discrepancy that is deferred for later action. A deferral is a formal process for delaying the completion schedule of maintenance items. A deferral might be required for reasons such as the inability to obtain consumable parts, accessibility, or operational imperatives.

You create flight data records to store the details that are associated with the aircraft's flights, such as departure and arrival times, on-block and off-block times, intermediate stops, meter values, personnel details, and replenishments. Only one flight data record can be active at a time.

You can use the inventory applications to track replenishments and munitions by using the inventory issues and returns processes. For non-rotable returns, you can select the default part for a replenishment. For configuration managed munition aircraft or equipment, you can select from the list of candidate parts based on the configuration rules that are associated with the build item.

If you are tracking munitions in the inventory applications, you can track the loading of munitions, expending of munitions, and unloading of munitions on active flight log book records. You can track both rotable parts, such as air-to-air missiles, and non-rotable parts, such as cannon rounds. The tracking of non-rotable parts stops after they are expended.

When you are tracking munitions, you add a row in the **Munitions** tab, select an option from the **Type** field for the process that you are tracking: LOAD, EXPENDED, or UNLOAD. You then select the build item. You are then able to enter data into the fields based on whether the munition is rotable or non-rotable, and the total quantities are automatically calculated. After you save the record for a rotable munition, the transaction is validated and the aircraft or equipment move occurs. For example, if you are recording a loading of an air-to-air missile, you select the serial number and can optionally select a work order. When the record is saved, the missile is installed on the aircraft or piece of equipment, because it was previously issued from the storeroom to the aircraft, piece of equipment, location, or work order.

Flight log books provide a way to track maintenance issues through the creation of discrepancy records. When the flight log book is active, you can create discrepancy records that are related to a flight data record. You can define post-flight inspection procedures in the flight log book setup record. Then, when you create a flight data record, a discrepancy is automatically created to ensure completion of the post-flight inspection. You can create a discrepancy for a work order when a work order is created. You can also create a discrepancy after a work order is created by using the **Create Discrepancy** action. You can also set mandatory failure reporting and include additional details on failures, such as failure codes and failure

classifications. If a discrepancy exists for a work order, the **Related Discrepancy** check box for the work order record is automatically selected.

Discrepancy records require corrective action to ensure that the aircraft is maintained according to regulatory requirements. The discrepancy record includes a code for the planned corrective action, a failure code, and a failure classification. When you save the discrepancy record, the discrepancy status is grounded. Depending on your security profile, you can change the status of the discrepancy record to allow usage of the aircraft. For example, if the fault does not affect the structural and mechanical integrity of the aircraft, you can change the status to limited release to service in accordance with regulatory requirements.

Revision of flight log book setup records

If changes to the template are required, the flight log book setup record is raised in revision and the status is changed to pending revision. After you save the changes, you can set the status of the flight log book setup record to active.

You can change the flight log book type for a specific flight log book and apply the latest revision of the flight log book setup record. For example, a new munition type is added to the flight log book setup record of the x_jet model. You can open a flight log book for a specific x_jet aircraft and change the flight log book type to the latest revision. Then, the flight log book of the x_jet aircraft includes information for this new munition type.

You can apply this action to multiple flight log books by selecting the same flight log book setup record from the **List** tab of the Flight Log Book application.

Enabling the inventory management process for flight log books

The inventory issue and returns process can be used for replenishments and for the loading and unloading of munitions in the Flight Log Book application. When you track replenishments and munitions in the inventory applications, you can more accurately manage your inventory and can conduct replenishment and munitions firing analysis for your entire fleet.

Procedure

1. In the Organizations application, select an organization, and then select **Select Action** > **CM Options**.
2. Select the check box for managing fuel, replenishments, and munitions in the inventory applications.
3. In the Part Master application, create default parts for the fuel, replenishments, and munitions that your fleet uses.

Creating flight log book setup records

The flight log book setup record provides the flexibility to create a flight log book record that is tailored to an aircraft and the regulations that are required in the country of registration of the aircraft. You create a flight log book setup record to configure how the flight log book record displays and collects information for a specific aircraft.

Procedure

1. In the Flight Log Book Setup application, click the **New Record** icon, and specify the type of the flight log book setup record.

2. In the **Flight Log Book Setup** tab, specify the model and configuration. The combination of model and configuration must be unique for each active flight log book setup record. If the flight log book setup record applies to all configurations of the selected model, do not specify the configuration.

3. Optional: In the **Details** section, specify whether munitions are used.

4. Optional: Specify whether status symbols are displayed in the flight log book record. Default symbols identify the statuses of the flight log book setup records and the flight log book records. If your implementation requires different symbols, you must provide the icons in a `.gif` file for each of the statuses.

5. Optional: Specify whether failure reporting is mandatory. Mandatory failure reporting requires that the pilot or mechanic provide details of the failure in discrepancy records.

6. Optional: Specify whether post-flight inspections are required. If post-flight inspections are required, add a job plan to the record.

7. Specify engines, meters, fuel tanks, and replenishments that represent the build items in the associated model and configuration.

8. Optional: Specify the munitions details.

9. Change the status of the record to ACTIVE.

What to do next

In the Flight Log Book application, create flight log book records for the aircraft in your fleet. The flight log book record is automatically based on the flight log book setup record that exists for the aircraft model and configuration.

Managing flight log book records

After you create a flight log book record, you can then create flight data records, discrepancies, and deferrals that are associated with the flight log book.

Creating flight data records

After a flight is completed, you create a flight data record to store information on the flight's arrival and departure times, meter readings, personnel, aircraft status, and replenishments. Any discrepancies that are discovered during the flight are associated with the flight data record.

Before you begin

Only one flight data record can be active at a time. If an existing flight data record is active, you must change the status to closed before you can save a new flight data record.

Procedure
1. In the Flight Log Book application, open the aircraft's flight log book.
2. On the **Flight Record** tab, add a new row and specify the departure and arrival times.
3. Add meter readings to record the flight hours.
4. In the **Flight Data** section, specify the time that the aircraft is on-blocks and off-block, and specify the departure location.
5. Indicate whether the flight is operated under the Extended-range Twin-engine Operational Performance Standards (ETOPS) regulations.

6. Optional: Specify whether a flight delay occurred. If a delay occurred, specify the duration of the delay, and a reason for the delay.
7. Specify whether the flight includes an intermediate stop. If the flight includes an intermediate stop, specify the arrival time, depart time, on-blocks, and off-blocks for the intermediate stop.
8. On the **Personnel** tab, specify the information for the flight crew.
9. On the Replenishments tab, specify the information for fuel, oil, and any other necessary replenishments, such as oxygen or munitions.
10. Save the flight data record.

Creating discrepancies and corrective actions

Depending on the overall aircraft status, you can report discrepancies and change the aircraft status. You can resolve the discrepancy by recording the corrective action and completing the discrepancy. If more work is needed to complete the discrepancy, you can generate the corresponding work orders.

About this task

If mandatory failure reporting is required for the aircraft, then you must specify failure information on the **Failure Details** tab. Whether failure reporting is mandatory is defined in the aircraft's flight log book setup record.

Procedure

1. In the **List** tab of the Flight Log Book application, select a record.
2. To report the discrepancy and its corrective action, click the **Aircraft Inspection and Maintenance** tab and specify the details of the discrepancy:
   a. Specify the discrepancy information and the corrective action. The default discrepancy status is GROUNDED, but you can change it to another status.
   b. In the **Aircraft Inspection and Maintenance tab**, specify the report type, such as PIREP for pilot reported or MIREP for mechanic reported.
   c. In the **Failure Details** tab, specify a failure classification and a failure code. When a work order is generated from a discrepancy record, the failure classification and code is included in the work order.
   d. Optional: To create a work order to complete the correction, click the **Create WO** icon. The work orders that you create are linked to the discrepancy records that you created.
   e. Optional: To defer the corrective actions, click the **Create Deferral** icon.
3. Save the record.

Creating deferrals from discrepancy records

If a corrective action for a discrepancy cannot be completed, you can defer the action.

About this task

You create a deferral from a discrepancy record. When the discrepancy is deferred, the deferral record remains open until the corrective action is completed. Work order records are generated for the corrective actions that you log for the aircraft.

Work orders are always associated with deferrals, and corrective actions are recorded in the work order. When the work order is complete, the deferral status is also changed to complete. The deferral record that is associated with the flight log

book is also completed by using the details from the completed work order.

Procedure

1. In the Flight Log Book application, select a discrepancy record and click the **Create Deferral** icon. The discrepancy is transferred to the **Deferral** tab and a work order is created to complete the deferral.
2. In the Deferral dialog box, specify the details of the deferral, including time and the meter-based deferral period.
3. Change the status of the deferral record to active. The active deferral updates the extended due points, which are the meter reading or dates at which inspections or maintenance tasks are due. The information for the extended due points from the flight log book deferral record is shown on the **Maintenance Planning** tab of the Assets application.

Chapter 10. Managing customers, agreements, and billing

Managing customers involving creating customer records, defining terms of agreements with customers, managing service requests from customers, and managing billing services.

Creating customer records

You create customer records in the Customers application and associate the customers with objects in other applications to give the customers user access to those objects.

Procedure

1. In the Customers application, click **Create Customer** on the toolbar.
2. Type the name or identifier of the customer.
3. Select the currency that the customer uses.
4. Specify financial and address details on the customer record.
5. Add customer contacts on the **Contacts** tab. Contacts are created in the People application. You can configure security settings to restrict the information that the customer contacts can access.

What to do next

After you have created a customer record, you can enter physical locations where aircraft or pieces of equipment will be managed for the customer by using the Service Address application. You can then set up security groups and restrictions for the customer and associate the customer with customer objects. You can proceed to set up the inventory, locations for services, and aircraft or pieces of equipment that are managed for the customer.

Customer-specific records

When a customer is associated with other records, those records become specific to the customer. You can limit the visibility of customer records to specific users. Also, certain field filters show results that are based on the record's associated customer.

Customers can be associated with many types of records, including customer agreements and price schedules, service level agreements (SLAs), response plans, job cards, tickets, work orders, sales orders, aircraft, equipment, locations, inventory, and billing records.

For example, when a customer is specified on a work order, only customer agreements, price schedules, job cards, response plans, and SLAs for this customer can be applied to the work order.

Customer agreements
You create customer agreements that specify the services that you provide, the terms, conditions, prices, and fees for services, and how you bill for services. You can revise customer agreements as needed.

Customer agreements are created in the Customer Agreements application. On an agreement, you specify the customer, specify agreed terms and conditions, billing details, price and billing schedules, and can define scoped work for specific aircraft or equipment. You can define parts pools that the customer participates in and is billed for. You also can view total billed and revenue amounts in your currency and a different customer currency.

Create customer agreements by specifying the following information as required:

• Associate customers with customer agreements and customer specific references such as aircraft, equipment, locations, and job cards.
• Billing and payment terms and periods. For pool agreements, specify such details as the No Fault Found (NFF) rate and the responsible party for transportation of repair parts.
• Work scope information for specific parts or aircraft and equipment, including work operations and work related dates.
• Maintenance parts pools and parts.
• Billing schedules for recurring fees and services.
• Price schedules for transactions and fees on completed work.
• Terms and conditions by adding existing terms from a library or creating them. You can specify that certain terms are visible on customer bills, work orders, tickets, or sales orders.

Service level agreements (SLAs) and response plans

Service level agreements (SLAs) and response plans can be associated with one or more customers. SLAs specify a committed level of service agreed to by the provider and customer. Response plans ensure predictable and repeatable responses to similar work requests.

If you associate a customer with an SLA or response plan, the SLA or response plan can be applied only to tickets, work orders, and sales orders for that customer. If you do not associate a customer with an SLA or response plan, the SLA or response plan can be applied to tickets, work orders, or sales orders for any customer.

Activation and revision

After you create an agreement, you change the status to make it active. During the life of an agreement, you might change the status for other reasons. For example, you might revise it and update the revision to extend the agreement end date.

Service level agreements (SLAs)

SLAs are created to document the commitments that you plan to fulfill for customers. SLAs specify commitments that are agreed levels of service between the service provider and the customer. SLA commitments can be measured in a qualitative or quantitative way. SLA commitments can be associated with one or more escalations that specify the actions that are needed if the commitment is not met.

SLAs can be applied to many types of records, including tickets and work orders. SLAs typically specify target dates for important activities that are related to work, such as target start, response, and delivery dates.

SLAs are created in the Service Level Agreements application. You can restrict service level agreements to the organization or site level. If you specify organization or site values, users can view or apply only SLAs within the specified organization or site.

You can specify the following kinds of information on an SLA. Some of the information is matched to the same information on the target record to determine whether the SLA can be applied.

- A ranking value. The ranking value chooses an SLA when more than one SLA is applicable to a record. A lower numerical value takes precedence over a higher one.
- Effective start dates, end dates, and review dates. These dates can be specified in workflow processes.
- Associate vendors and contracts.
- Associate customers so that the SLA applies only to records for the specified customer.
- A calendar that calculates target date values.
- The commitments that are related to the type of record that the SLA applies to. For example, for tickets you can specify target dates for target times for response, resolution, delivery, availability, and other values. For work orders, you typically specify target times for start, finish, and delivery time.
- The conditions under which a service level agreement applies, such as classification, services, and other criteria.
- Associate related service level agreements.
- Aircraft or equipment locations, or parts pools on the target record that the SLA applies to.
- Key performance indicators (KPIs) that track performance over time.
- Escalations, actions, and notifications to support the SLA commitments.

People application

You use the People application to create, to modify, to view, and to delete records for individuals. The People application stores information about individuals, such as users, laborers, aircraft or equipment owners, and supervisors who receive workflow notifications.

A person record is a record for an individual whose name could appear as a text field value. Workflow assignments are made to roles. All roles resolve to a person, to a person group, or to an e-mail address.

The name of a person is used as the text field value in the **Reported By** field or in the **Affected Person** field on a service request, in the **Supervisor** field on a labor record, or in a **Ship To** field or **Bill To Attention** field on a purchasing record.

You must create a person record for any individual who is assigned tasks as part of a workflow process. When you create records in the Labor application and in the Users application, you must create a person record. Person records might have to be created for other individuals who do not have records in the Labor application or in the Users application.

People in your enterprise can work with a specific customer or with multiple customers. When work requirements change, you can change the customers that a person can work with. You can also create person records for your employees or employees of customers or vendors that you do business with.

Person records that you create for use as part of workflow processes contain the values in the following fields:

Supervisor
> The person who oversees or manages the individual. This information is used for escalations.

Primary E-mail
> The e-mail address where notifications are sent.

Primary Calendar
> The work calendar that the individual follows. This information is used when determining assignments and escalations.

Primary Shift
> The shift that the individual works. This information is used when determining assignments and escalations.

Workflow E-mail Notification
> The circumstances when the individual receive e-mail notifications for task assignments. The default value is PROCESS.

Workflow Delegate
> The person identifier of the individual designated to receive assignments when the primary individual is unavailable for an extended time, such as vacation or sick leave.

Delegate From and Delegate To
> The time period when workflow processes route assignment to the delegate. If these fields are empty, all workflow assignments are routed to the delegate.

Creating person records

To store personal and official information, you can create and maintain records about people in your organization, such as users, laborers, supervisors, and individuals who receive workflow notifications.

Before you begin

You create person records for any individual who could appear on another record. However, you must create a person record for each individual who has a labor or user record.

Procedure

1. In the People application, click **New Person**.
2. Optional: If the **Person** field is blank, type a unique person identifier.
3. Specify employee and workplace-related information. If you change the **First Name** field or **Last Name** field, these changes overwrite the nickname in the **Display Name** field.
4. Optional: Type a nickname in the **Display Name** field.
5. Optional: If one of your customers or vendors employs this person, enter the appropriate information in the **Cust/Vendor** field. If the **Cust/Vendor** field is empty, the **Cust/Vendor Type** field is set to Internal.
6. Optional: Specify workflow and work order information, important dates, and procurement card details.
7. Click **Save Person**.

What to do next

The information in the Personal section of the person record is shared with the Labor and Users applications. You can enter or change the information in these fields from any of these three applications.

Defining response plans and actions

Response plans ensure predictable and repeatable responses to similar work requests. You can apply response plans to tickets, work orders, sales orders, workflows, or escalations.

About this task

Response plans are applied when certain information on the ticket, work order, or sales order matches the same information that is defined on the response plan. Response plans can be applied to records manually or by workflows or escalations.

Procedure

1. In the Response Plans application, create a response plan.
2. Specify a ranking value. If more than one response plan is applicable to a record, the ranking value is used to select a plan. A lower number in the **Ranking** field takes precedence over a higher number.
3. Specify the type of record that the response plan applies to. You also can specify an administrator and the type of date that the response plan applies to.
4. Specify the effective and renewal dates.
5. Optional: In the **Applies To Calendar** section, specify the organization, calendar, and shift. Specified values are part of the matching logic; the response plan is applied only to records reported during this calendar and shift.
6. Specify conditions, locations, aircraft, equipment, or parts pools that the response plan matches on the records that it can be applied to. The less specific that you make the response plan, the more records it can be applied to.
7. Specify the response actions and notifications. For example, you can specify actions or action groups that create related records, change record statuses, or specify information on other records. You can associate a communication template with a response action to automate response notifications.
8. Optional: To specify that the response plan is applied only for work or services for one or more customers, select the action to associate customers with the response plan. Response plans that do not have specified customers can be applied to records for any customer.
9. Save the response plan.

What to do next

To make the response plan active, change the status. An active response plan can be applied to other records. If you want to modify the response plan, you must change the status to inactive.

Managing customer inventory

You can manage inventory for customers. Inventory includes parts, services, and tools. You can associate customers with inventory and optionally, manage prices in price books. Price books can specify different kinds of pricing for use of parts, services, and tools.

Managing list prices in price books:

With price books, you can manage the list prices of parts or items, services, and tools that you use on work that is done for your customers. In the price books, you can specify different pricing levels for different customers and situations.

About this task

Price books list a published base price, or list price, for parts or items, services, and tools. Some prices can be calculated based on the characteristics or attributes of the provided services.

The prices are applied to costs of materials, services, and tools on work orders that are associated with a price schedule. They also can be applied to recurring costs on billing schedules.

Discounts and markups that are specified in customer agreement price schedules and billing schedules are applied to the list price in a price book to calculate the actual price that the customer is charged. For example, a price schedule might specify that in most situations, under this agreement, a customer receives a 15% discount from the list price, and in special situations, the customer receives a 30% discount. If the service is required at a location that is close to the service provider, then the discount might be increased to 30% when the price is calculated. If the call is at night, then the discount might be decreased to 10% when the price is calculated.

Adding tools:

A tool record defines a tool and allows you to associate information with the tool. Tools are used to perform work, such as building, maintenance, and repairs.

About this task

When you add a tool record, you can list other tools that are interchangeable with this tool and qualifications that a person needs to use the tool.

Procedure
1. In the Tools application, click **New Tool**.
2. Optional: If the **Tool** field is blank, enter a value.
3. Enter a part description and batch type.
4. Optional: Complete the remaining fields to further define the tool.
5. Save your changes.

Related concepts:

"Tools application" on page 233
You use the Tools application to manage information about the tools used to perform work. Tools are typically nonconsumable parts for which you charge an hourly rate for their use. Examples of tools include air compressors, nail guns, calibration equipment, and heavy equipment such as cranes and excavators.

Creating service parts:

You use the Service Part Numbers application to create a service part record. A service part record identifies the part, lets you associate information with a part, and view or manage a list of vendor companies that supply service parts.

Procedure

1. In the Service Part Numbers application, click the **New Service Part Number** icon.

2. Enter information in the **Service Part Number** field, **Description** field, **Commodity Group** field, and **Commodity Code** field.

3. Optional: If the service part is not taxable, select the **Tax Exempt** check box. The buyer for your organization determines the tax-exempt status of service parts.

4. Optional: In the **Receipt Tolerance %** field, specify the percentage of service parts that can be received over the amount ordered in the initial agreement. The percentage value is applied to the organization level and to the vendor level.

5. Optional: If you want to prorate the cost of the service part on purchase requisitions, purchase orders, and invoice lines, select the **Prorate** check box. You can add costs only to parts that are issued on receipt.

6. Optional: If you want to require an inspection of the service part, select the **Inspection Required** check box.

7. In the **Vendor** field, select a value.

8. Optional: Complete additional fields.

9. Save your changes.

Related concepts:

"Service Part Numbers application" on page 233
Service parts are services such as grounds maintenance or plant security. They are not associated with an aircraft or piece of equipment. Services can often include labor, tools, and materials but are billed as one unit. Services can be provided to customers on a frequent or infrequent schedule. You maintain service part records in the Service Part Numbers application and bill for service parts on a billing schedule.

Work orders for customers

The customer that is associated with a work order determines the classifications, aircraft or equipment or locations that are processed with the work order. The customer also determines which users can access the work order record.

A customer must be assigned to a work order for you to apply a customer agreement, price schedule, and other customer-specific information to a work order. When you associate customers with work orders, you can also keep the work order records restricted to the users who have permission to access the data of a particular customer. You associate customers with users in the Security Groups application.

When you create a work order, information from the customer about the aircraft or equipment or location is copied to the work order. The combination of location, aircraft or equipment, and customer on the work order determines the best matches when an SLA, price schedule, or response plan is selected for a work order.

You can create a work order for an aircraft or piece of equipment or location. The associated customer record must be active. The following precedence list determines which customer is copied to a work order:

- If the work order specifies an aircraft or piece of equipment that is associated with a customer, then the customer of the aircraft or equipment is applied to the work order. The cost center and customer charge account from the aircraft or equipment are copied to the work order.
- If the work order does not specify an aircraft or piece of equipment that is associated with a customer, but specifies a location that is associated with a customer, then the customer of the location is applied to the work order. The cost center and customer charge account from the location are copied to the work order.
- If the work order does not specify a location that is associated with a customer, then you can specify a customer on the work order.

If you add, change, or remove a customer on a work order, the existing classification or attributes might not be relevant. Remove classification information that is not relevant to a work order. The customer can be changed by changing the value in the **Customer** field or by changing the aircraft or equipment or location that determines the customer on the work order.

Customer-specific job cards

You can associate one or more customers with a job card so that the job card is available only for work that is done for those customers.

Job cards are applied to work order records, task card records, route stops, and measurement point records. When job cards are associated with customers, they are only available to be applied to records when certain record elements match.

Adding aircraft or equipment to job cards

To add aircraft or equipment to a job card, some information must match. Either the customers on the job card match the customers for the aircraft or equipment on the work order, or the aircraft or equipment on the work order do not have associated customers. When an aircraft or piece of equipment or location that has associated customers is added to the job card, the primary customer for the aircraft, equipment, or location must be a customer that is associated with the job card. When a part is added to the job card, any customer for the part can be a customer that is associated with the job card.

Adding classifications to job cards

Classification information on a job card is not matched to a customer on the job card. However, when a job card is applied to a work order, the classification is applied only if the customer on the classification matches the customer on the work order.

Adding operations to job cards

Tasks that have nested job cards can be added to customer-specific job cards if certain information matches. The nested job card either must be associated with customers on the main job card or the nested job card must not be associated with any customers. For example, if the main job card is associated with customer A, an operation with a job card that either is associated with customer A or is not associated with any customer can be added. If the main job card is associated with customer A and customer B, an operation with a nested job card for customer A or for customer B can be added. An operation with a job card that is not associated with a customer can be added. An operation with a job card that is associated with customer C cannot be added.

Applying job cards to work orders

A job card that is associated with customers can be applied to a work order if one of the customers on the job card matches the primary customer for the aircraft, equipment, or location on the work order. If an association exists between the job card and a safety plan when the job card is used on the aircraft, equipment, or location, the safety plan is copied to the work order. If an association exists between the aircraft or equipment on the work order and the point name on the job card, a single measurement point is copied to the work order.

For example, a work planner creates a work order for a piece of equipment that is named Boiler1 and wants to select a job card. The boiler is associated with customer A1 as the primary customer. The planner clicks the **Select Value** icon next to the **Job Card** field. In the Select Value window, the planner sees only job cards for customer A1 that apply to the piece of equipment Boiler1 and job cards that are associated with no customers.

Applying job cards to task cards

A job card that is associated with customers can be applied to a task card if one of the customers matches the primary customer for the aircraft, equipment, or location on the task card. If the task card is associated with a route, a job card can be added to a route stop if one of the job card customers is the primary customer for the aircraft, equipment, or location on the route stop.

Associated task cards for master task cards

When task cards are created from a master task card, the list of available aircraft or equipment and locations depend on a match between a primary customer of the aircraft, equipment, or location and the customer on the first job card in the job card sequence. If no customer is associated with the first job card in the sequence, no match needs to be made.

Applying job cards to route stops

A job card that is associated with customers can be applied to a route stop if one of the customers is the primary customer for the aircraft, equipment, or location on that route stop. If this route is used on work orders that are generated from task cards, the job card is copied from this route stop. If the field is empty, the job card is copied from the task card.

Applying job cards to measurement points for condition monitoring records

A job card that is associated with customers can be applied to a measurement point if one of the customers is the primary customer for the aircraft, equipment, or location to be measured.

Customer security

You must configure security to ensure that only authorized users can view information about customers.

Customer agreements

You create customer agreements that specify the services that you provide, the terms, conditions, prices, and fees for services, and how you bill for services. You can revise customer agreements as needed.

Customer agreements are created in the Customer Agreements application. On an agreement, you specify the customer, specify agreed terms and conditions, billing details, price and billing schedules, and can define scoped work for specific aircraft or equipment. You can define parts pools that the customer participates in and is billed for. You also can view total billed and revenue amounts in your currency and a different customer currency.

Create customer agreements by specifying the following information as required:

- Associate customers with customer agreements and customer specific references such as aircraft, equipment, locations, and job cards.
- Billing and payment terms and periods. For pool agreements, specify such details as the No Fault Found (NFF) rate and the responsible party for transportation of repair parts.
- Work scope information for specific parts or aircraft and equipment, including work operations and work related dates.
- Maintenance parts pools and parts.
- Billing schedules for recurring fees and services.
- Price schedules for transactions and fees on completed work.
- Terms and conditions by adding existing terms from a library or creating them. You can specify that certain terms are visible on customer bills, work orders, tickets, or sales orders.

Service level agreements (SLAs) and response plans

Service level agreements (SLAs) and response plans can be associated with one or more customers. SLAs specify a committed level of service agreed to by the provider and customer. Response plans ensure predictable and repeatable responses to similar work requests.

If you associate a customer with an SLA or response plan, the SLA or response plan can be applied only to tickets, work orders, and sales orders for that customer. If you do not associate a customer with an SLA or response plan, the SLA or response plan can be applied to tickets, work orders, or sales orders for any customer.

Activation and revision

After you create an agreement, you change the status to make it active. During the life of an agreement, you might change the status for other reasons. For example, you might revise it and update the revision to extend the agreement end date.

Specifying pricing and billing schedules for services

You can set up automated billing schedules for the services that you provide on a recurring basis. You can set up manual or automated price schedules for work transactions and fees. Billing and price schedules are set up in the Customer Agreements application. You review or create bills in the Customer Billing application. If you allow customers to review bills, they review them in the Bill Review application.

Billing schedules for recurring costs

On billing schedules, you can automatically bill for the recurring costs or fees for the services that you provide to customers. Recurring costs include fixed fees, parts, services, and fees for scheduled and actual usage. You can bill by time period and by financial period and preview the billing schedule to ensure that the schedule is set up correctly.

You add billing schedules to customer agreements to specify your prices for recurring fees and costs and the schedule at which you bill. You specify pricing rules for each recurring cost. You also specify the billing period, the interval that determines billing frequency, the number of billing intervals and the first bill date. The billing period can be days, weeks, months, years, or financial periods.

If a billing cycle is monthly, you can bill on the last day of the month. You also can bill on any day up to the 30th day, which you indicate with the first bill date. In future months, a bill is created on the same day of the month. If you bill monthly on the 29th or 30th day, in February, the bill is created on the last day of the month.

After you specify the billing period, interval data, and first bill date or first bill period, other dates are calculated for you. The final bill date for the billing schedule is calculated based on the values in the Next Bill Date field, Billing Interval field, and the Number of Billing Intervals field. You can modify the next bill date for billing schedules and price schedules on customer agreements that have a draft or pending review status. The dates on the billing schedule must fall within the active dates of the customer agreement.

You can preview the billing schedule so that you can verify that the specified period, interval, number of billing intervals, and bill dates create the schedule that you want. To preview the billing schedule, click **Preview Billing Dates**. In the Preview Billing Dates window, you see up to 20 future billing dates.

A customer agreement can contain multiple billing schedules. For example, a building management company might set up a billing schedule to bill each month for rental of a fixed space. The company can also bill each quarter for scheduled grounds maintenance fees and bill each week for on-call maintenance work such as repairs. You specify pricing rules for each recurring cost.

When the customer agreement is approved, a sales order is created for each recurring cost on the billing schedule. Prices are calculated from the pricing rules on the billing schedule. The sales orders are then copied to the bill batch. The bill batch is created on the specified next bill date for each billing schedule on the agreement. For the first run, the bill batch is created at the earliest time after the first bill date.

Both the sales orders and bill batch lines contain information that identifies the originating billing schedule.

The bill batch status is set to the initial status that is specified on the billing schedule. Typically, bill batches do not require your review and are sent directly to bill review or to customers.

To activate automatic billing schedules, your administrator must set up the PLUSPBILLGENCRONTASK cron task.

You can modify a billing schedule if the customer agreement is in Draft, WAPPR (waiting for approval), or PNDREV (pending review) status. You cannot change the billing schedule if the final bill date is in the past. You can delete a billing schedule only if a bill batch was never created for it and there is no billing history.

Billing history

The billing history shows all the bill batches that are created from this billing schedule. It does not include bill batches that are created by any manual billing processes, such as bill batches that are created for transactions on a work order. You also can view billing schedules that are in progress.

Billing schedule setup and processing
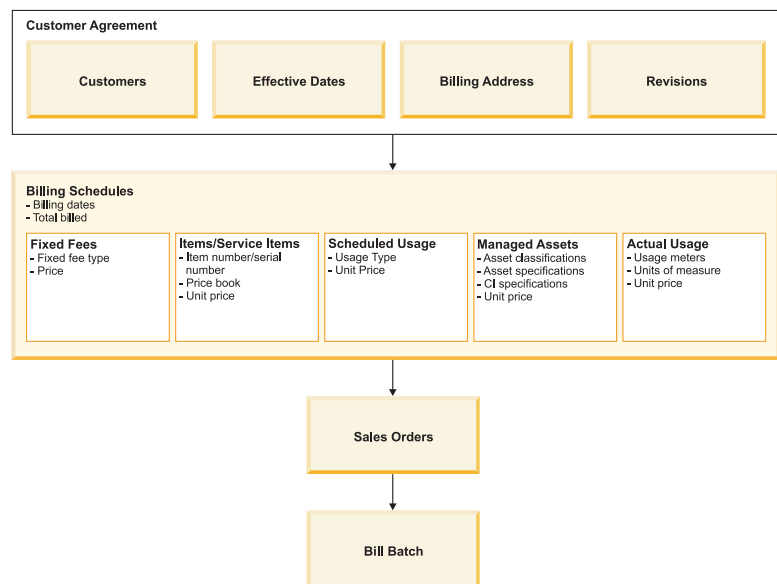
Creating billing schedules for recurring costs:

To bill customers for recurring costs, you can add billing schedules to the customer agreement. The billing schedule automatically adds costs to bill batches when the billing schedule cron task runs.

Procedure

1. In the Customer Agreements application, open the customer agreement that you want to add the billing schedule to.
2. In the Billing Schedule section, add the schedule details.
3. In the Billing Schedule Detail section, enter the details of the costs to be included on bill batches that are created when the billing schedule is run. You can bill for fixed fee charges, items, service items, tools, and scheduled usage. Items and service items can be priced by an associated price book.
4. Save the billing schedule.

Results

If the customer agreement is approved and active, the billing schedule is run at the appropriate time based on the specified dates and terms. Sales orders are created

for costs on the billing schedule. A bill batch is created, and the sales orders are copied to the bill batch.

Billing schedule types:

You can create different types of billing schedules to bill recurring costs.

Fixed fee billing schedules:

A billing schedule can include billing for fixed fees, such as quarterly service fees for a fixed amount of space that is leased to tenants.

For example, a service company provides building maintenance services to the offices of a law firm. The customer agreement for the customer and services specifies that the law firm is charged $4500 a month for general maintenance work. This amount is entered as a fixed fee on the customer agreement billing schedule.

When a bill batch is created for the billing schedule, the fixed fee is copied to a sales order and the sales order is copied to the bill batch. The law firm is automatically billed $4500 on the 15th of each month.

Example: Billing for fixed monthly fees:

In this example, the A1 Services Company provides building maintenance services to the offices of the law firm of Stein, Brown, and Roberts (SBR). They agree to a monthly billed fee of $3500.00 to be billed at the end of each month. They plan to review the agreement in 12 months. Arthur is a customer account manager at A1 Services Company (A1). He works with William, a billing manager at A1.

Step 1: Create a customer agreement

In the Customer Agreements application, Arthur creates an agreement for the maintenance services that A1 provides to SBR. Arthur can create agreements only for customers that he works with. Arthur specifies the agreement start date as the beginning of the current month. Arthur adds terms that are related to prices and taxes. He verifies the contact information for this customer and saves the record.

Step 2: Define the billing schedule

On the **Billing Schedule** tab, Arthur inserts a row for a new billing schedule. He specifies a monthly billing period for a term of 12 months. A1 sends its bills on the 15th of each month. Today is the 5th day of the month, so Arthur specifies a first bill date of the 15th day of the current month. Because A1 reviews all bills before the customer previews them, Arthur sets the initial status of all bills for this agreement to In Progress. If A1 prefers not to review the bills before their customers review them, they can set the status of generated bills to Prebill. If they set the status to Prebill, the record is added to the billing review for the customer to approve, and the initial review by A1 is bypassed.

In the billing schedule details, Arthur adds a fixed maintenance management fee of $3500.00 and saves the record.

The A1 Services customer account manager reviews the agreement and approves it. The approval causes a workflow-enabled notification to go to the A1 billing manager.

Step 3: Review the generated bill

Near the end of the month, William, the billing manager, confirms with the system administrator that the PLUSPBILLGENCRONTASK cron task is active. A1 scheduled this cron task to poll records every day. For every active customer agreement, the cron task can create a bill batch for billing schedule items on the date that is specified as the next bill date. Sales orders are created for the fixed fee charges, items, service items, tools, and scheduled usage charges on the billing schedule. For SBR, the cron task creates a bill batch for the maintenance fee on the customer agreement. It creates and copies a sales order line for the fixed fee to a new bill batch.

In the Customer Billing application, William reviews the monthly maintenance bill for SBR. The bill is accurate and he changes the status to Prebill. A1 allows authorized customers to review bills before they are sent. A bill with a Prebill status is available for customer review in the Bill Review application. If there is an inaccuracy on a bill line, the reviewer can hold or remove it and the line does not advance to bill review.

Eileen is the purchasing manager for SBR and is named on the customer agreement as a contact. Eileen is authorized to review bills for SBR. On the last day of the month, she logs in to A1's system and can see limited billing information for SBR. She reviews the bill batch that contains the line for the maintenance fee. Eileen approves the line and changes the status of the bill batch to indicate that it is reviewed. On bills with several lines, she can approve all lines that are waiting approval and then change the status of the bill.

William completes the review for A1 and changes the status of the bill to indicate that it is billed to the customer. The bill batch is complete.

If Eileen disputes a fee, William can review her comments and adjust the bill if he agrees with the comment.

Step 4: Issue the fixed fee bill

The bill batch is issued through the A1 accounts payable system. The billed amount is added to the revenue shown on the customer agreement.

Part billing schedules:

A billing schedule can include billing for parts, such as the fees for the maintenance of customer aircraft or equipment. The part charges are copied to sales orders when a bill batch is created for the billing schedule. The sales orders are copied to the bill batch.

Part billing schedules include the price book that is used as the source of the part default list price. The billing schedules list equipment that the customer requires service for. The equipment can include aircraft or equipment or parts. The aircraft or equipment can include serial numbers.

If the customer agreement is in Draft, WAPPR, or PNDREV status, you can set the prices to their default value, which is the value from the appropriate price book revision. The appropriate price book revision is based on the price effective date, the customer agreement start date, and the next bill date. If no matching price book is found, the billing schedule price is not changed.

Example of billing for after-market maintenance services

The Acme Manufacturing Company sells medical devices to hospitals and healthcare providers. They also sell maintenance service agreements for the equipment that they sell.

Customers receive scheduled preventive maintenance and on-call repair services from Acme service technicians. Customers who receive these services agree to a billing schedule that specifies a monthly maintenance charge for each piece of equipment being maintained.

The agreement billing schedule lists, by serial number, each piece of equipment being maintained, the monthly charge for the maintenance services, and the number of months that Acme agrees to provide the services at the guaranteed fee. The agreement also provides for on-call and on-demand repair services at a stated time and material price structure. The terms of this agreement allow occasional revisions. The revisions allow equipment to be added or removed from the agreement, and for the prices to be increased or decreased.

The billing process for the identified aircraft or equipment that are being maintained consists of billing the listed charges on the current revision of the billing schedule on the day that is specified on the billing schedule time interval.

Service item billing schedules:

You can bill for service items on a billing schedule. Service items are typically a set of services, such as materials, labor, and tools, that are provided together and billed as a fixed cost.

Service items can be supplied by internal or external vendors. If service items are used on work order plans or actuals and are supplied by an internal vendor, you are not required to go through a purchasing process.

Service item prices are calculated according to pricing rules that are defined for the billing schedule. If a price book is associated with service items, the recurring price of the service item in the price book becomes the default list price for the service item. The price book can also specify condition-based prices that are based on a characteristic of an aircraft, equipment, or location for the provided service. The primary customer that is associated with the aircraft, equipment, or location must be the customer on the customer agreement.

Example of billing for services

The XYZ Service Company provides grounds maintenance service to hospitals and healthcare providers. The customers receive scheduled service and on-call services. Customers who receive these services sign a service level agreement that specifies a monthly charge for services.

The agreement billing schedule lists each regular service, such as lawn care, the monthly charge for the service, and the number of months that XYZ agrees to provide the services at the guaranteed fee. The agreement also provides for on-call and on-demand services, such as snow plowing, at a stated time and material price structure. The terms of this agreement allow occasional revisions. The revisions allow services to be added or removed from the agreement, and for the prices to be increased or decreased.

The billing process for the identified services consists of billing for the listed charges on the current revision of the billing schedule on the day that is specified on the billing schedule. A cron task copies service item prices to a sales order at a regular interval. The sales orders are copied to the bill batch.

In another example, janitorial service prices for a hotel can be based on a list price plus a price that is based on the number of square feet of the location. Square footage is a characteristic of the location.

Scheduled usage billing schedules:

A billing schedule can include scheduled usage fees, such as rental fees for space in a building. The usage fees are copied to sales orders when a bill batch is created for the billing schedule. The sales orders are copied to the bill batch.

Example of scheduled usage billing

Greenacre Leasing Company provides a fixed amount of space for lease to a customer, and the agreement includes some maintenance services. The customer pays a fixed amount for each square meter of space for the duration of agreement. The customer agreement lists the space and the amount charged. A billing schedule is set up for the fixed space so that the customer is automatically billed each month for the space rental.

Actual usage billing schedules:

You can create billing schedules to bill actual usage fees, such as for such as actual disk storage space that was used or building rental space that was used. Actual usage is billed by the financial period that is associated with the usage dates.

Actual usage billing schedules enable you to bill for aircraft, equipment, or location usage that can change over time. For example, a customer might use more or less space each month, so the amount billed to the customer varies each month.

Usage meters measure the types of usage for an aircraft, equipment, or location and the measurement units that you want to bill by. They are specified for an organization in the Organizations application. On a customer agreement billing schedule, they can be specified on the **Actual Usage** tab along with the price to charge for usage. The meters are specified on the aircraft, equipment, or location record for one or more customers.

A financial period is associated with each date of actual aircraft, equipment, or location usage. If the associated financial period for a measurement date is closed, the next open financial period is used.

You can specify to bill all previously unbilled usage or only unbilled usage for the prior financial period. For example, if you generate a bill batch in the month of July for June usage, you can choose to include or exclude usage that has occurred to date in July.

A sales order is created for unbilled usage that you include for the aircraft, equipment, or location. Prices are calculated from the pricing rules in the billing schedule. The unit price is the price that is within the range of the total count of all of the usage for that usage meter and for that customer. Actual usage charges are copied to sales orders when a bill batch is created for the billing schedule. The sales orders are copied to the bill batch.

Example

ABC Management Inc. is a facilities management company that provides building and office maintenance services. They charge each client a monthly fee in addition to a custodial fee. The monthly fee is fixed, but the custodial fee is calculated based on the size of the space that is maintained. It can change from month to month as customers increase or decrease their occupancy space. The billing schedule contains the fixed monthly fee, and a list of the spaces that are used, with the rate per square foot for each space. ABC Management creates financial periods for each month. They bill actual usage that occurred during the previous financial period.

Each month, the usage fee is calculated by multiplying the occupied square footage by the price on the billing schedule. From the occupied locations, the space usage, in square feet, is collected for the measurement dates and the usage rate is calculated. The usage dates are associated with the financial period for that month. Usage fees are billed by calculating the space that is used for the financial period to be billed and calculating the price for that usage from the billing schedule.

Managed equipment billing schedules:

You can bill for managed equipment, such as servers and workstations, on a billing schedule. The managed equipment charges are copied to sales orders when a bill batch is created for the billing schedule. The sales orders are copied to the bill batch.

Billing schedules for managed equipment enable service providers to bill customers for fees that are based on the number of pieces of equipment that they are managing. This number can change during a billing period. You can bill for managed equipment by time period or by financial period.

The **Managed Equipment** tab in the Billing Schedules tab of the Customer Agreements application lists the classifications that are to be used to bill for equipment and the unit price for each.

The unit price for the equipment classification is based on the total number of pieces of equipment being managed. For example, there may be one unit price that is specified for a range of 1 to 25 pieces of equipment that are being managed, and another unit price that is specified for a range of 26 to 200 pieces of equipment. If there is no range pricing, you can specify an exact price.

To be included in a bill, a managed piece of equipment must be associated with a customer and the status of the equipment must be operational.

A sales order is created for each operational piece of equipment, in the organization for the customer, that is classified with one of the listed classifications. Each piece of equipment is billed on a single sales order. The price for the piece of equipment is the sum of the unit price for the classification of the equipment, and the price for each of the features of the equipment, as detailed in the related specifications.

Example of recurring billing of managed equipment

Excell Support Systems (ESS) provides IT support for their clients. ESS bills each of their clients a monthly fee. The fees for managing IT equipment depend on the type of equipment that is being managed, and the features or configuration of the

equipment. Additionally, ESS provides services to their clients and bills the clients based on the usage of those services. For example, for email services or storage services, clients are billed based on the amount of storage space that is used. For backup and restore services, clients are billed based on the backup file size, the frequency of backups, and the number of generations of backups stored.

Price schedules on customer agreements

Price schedules on a customer agreement describe services that you provide, aircraft or equipment and locations that are entitled to services, conditions under which you provide services, and the pricing rules for completed work transactions. You can apply price schedules to work plans so that you can provide price estimates to customers for proposed work. You also can specify fixed fees that you bill for reaching a milestone in a project.

A customer agreement contains one or more price schedules that are subject to the terms, conditions, and other criteria that you specify on the agreement. The customer agreement is the parent to its child price schedules. Since each schedule specifies billing rules, you create another schedule when new billing rules or other criteria exist.

You can apply most price schedules to tickets, work orders, and sales orders. Price schedules that bill for project milestones are applied only to sales orders. Price schedules that bill for use of parts from parts pools are applied only to tickets and work orders.

You can set up price schedules that manually or automatically create bill batches. If you specify automatic billing of price schedules, you can group bill lines into bill batches that are based on a grouping attribute that you specify in the automated billing settings. You can group the bill lines by order number, customer cost center, customer PO, or reporting user.

Billing and pricing details and rules

When you create a price schedule, you specify billing and pricing details and rules. You can specify the following information:
- A ranking value, which is used when more than one schedule matches the criteria on the target record.
- A calendar or shift to which the pricing is applicable.
- Whether price quotes can be used. Price quote details are specified on the work order.
- Whether a PO is required for billable work.
- Whether approved work transactions on open work orders can be billed.
- Fixed fees that are billed when a project milestone is reached.
- Classification, included services, and other conditions and criteria that you can specify.
- Locations, aircraft or equipment, configuration parts, and pool parts to match on the target record.
- Included and minimum price amounts for labor, materials, tools, and services.
- Pricing rules, such as markups, discounts, list prices, and performance-based prices. Pricing rules apply to actual labor, materials, services, tools, and key performance indicators (KPIs).
- Other fixed fees, incentives, or penalties billed each billing cycle.

Applying agreements and price schedules

The price schedule is applicable to records with values that match conditions that you specify on the price schedule. For example, you can specify locations, aircraft or equipment, classification, priority, services, and other conditions that you define. The less specific the price schedule, the more records to which it is applicable. Similarly, the less specific the record, the more price schedules to which it is applicable. When you apply a price schedule to a ticket, work order, or sales order, the system matches fields on both records and selects the applicable price schedule based on the best match. If more than one price schedule is applicable, the ranking value on the price schedule is used; a lower ranking number takes precedence over a higher number.

You apply an agreement and price schedule to a record with the **Apply Customer Agreement** action. This action is available in multiple applications.

When you apply an agreement to a work order, any operations that are on the work order inherit the price schedule. Child work orders and follow-up work orders do not inherit the price schedule.

Removing and applying price schedules

In some cases, you can remove an applied price schedule. Optionally, apply a different price schedule. If you remove a price schedule, you remove all prices from the record and remove the record from its bill batch.

Automated and grouped billing from price schedules:

You can specify the automatic billing of price schedules on a customer agreement. You also can specify that certain types of bill lines are grouped on different bill batches. Both of these features can make billing and reviewing more efficient.

Automated price schedule billing

Automated billing settings that you specify in the Customer Agreements application apply to all price schedules on the agreement. You can specify the schedule for automated bills with the **Billing Cycle** and **Billing Interval** fields. After you specify the schedule, you can preview the billing dates to ensure that the settings are correct.

If a billing cycle is monthly, you can bill on the last day of the month. You also can bill on any day up to the 30th day, which you indicate with the first bill date. In future months, a bill is created on the same day of the month. If you bill monthly on the 29th or 30th day, in February, the bill is created on the last day of the month.

If the billing cycle is by financial period, you can specify the number of days after a period ends that the bill is created. By default, if financial period billing is selected, approved work order transactions are included if they occur before or during the financial period for the bill batch. You can modify this setting.

After you set up an automated billing schedule, a bill batch is created on the next bill date that is specified on the customer agreement. All eligible tickets, work orders, and sales orders are copied to the new bill batch. The bill batch has the

status that is specified in the customer agreement. You can modify the next bill date for billing schedules and price schedules on customer agreements that have a draft or pending review status.

In the customer agreement, the last copy status and history values are updated. The bill batch end date is set to the next bill date of the agreement. The next bill date that is set by the cron task is not affected by a manually created bill batch.

If you bill by financial period and the agreement does not specify any valid financial periods, then bill batches are not created. You can either specify more financial periods or bill manually.

The next bill date that is set by the cron task cannot be later than the customer agreement end date.

If the copy process fails, for example, due to a server failure, you can create the bill manually.

Grouped work order, ticket, and sales order transactions on bill batches

If you automate price schedule billing, you can specify that certain bill lines are grouped on bill batches. You can specify the grouping by order number, customer cost center, customer purchase order, or the reporting user.

Bill lines that do not meet the grouping criteria are added to a separate bill batch.

Bill batches for a customer agreement can be grouped in one of the following ways:

Order number
    A bill batch is created for each work order, ticket, and sales order that is associated with the price schedule. A separate bill batch is created for all bill lines that do not contain an order number.

Customer purchase order
    A bill batch is created for each customer purchase order (PO) that is associated with the price schedule. Customer POs can be specified on work orders, tickets, and sales orders. For example, if three customer POs are specified on five work orders and two tickets, three bill batches are created for those bill lines. A separate bill batch is created for all bill lines that do not contain a customer PO.

Customer cost center
    A bill batch is created for each customer cost center that is associated with the price schedule. Customer cost centers can be specified on work orders, tickets, and sales orders. For example, if two customer cost centers are specified on 100 tickets and 20 sales orders, two bill batches are created for those bill lines. A separate bill batch is created for all bill lines that do not contain a customer cost center.

Reporting user
    A bill batch is created for each reporting user who is associated with the price schedule. The reporting user is identified in the **Reported By** field on work orders, tickets, and sales orders. For example, if four reporting users are specified on 10 work orders, four bill batches are created for those bill lines. A separate bill batch is created for all bill lines that do not contain a reporting user.

Milestone billing of projects:

You can bill for project work by milestones that you define with your customer. When each milestone is reached, your customer is billed for part of the total amount of the project work. You might define and bill by project milestones for services that involve multiple work orders and resources that are delivered over a long time.

Milestone billing setup and process

You bill for project milestones on customer agreement price schedules. For each milestone, specify that the price schedule applies to sales order objects. Then, enter the fixed fee amount for the milestone, and specify the schedule type as milestone.

When the customer agreement is approved, a sales order for each milestone schedule is created. After the sales order is created, the ranking value of the price schedule is set to 1, and the **Condition** field is filled with information about the linked sales order. This information overwrites any existing information in those fields, and the fields cannot be edited.

The new sales order has a status of waiting approval and the line price can be updated, for example, by a revised price schedule. When the sales order is approved, completed, or closed, the associated price schedule cannot be revised.

The following actions can create the bill for the sales order:
- Manual copy the sales order to the bill
- Set up automated billing for the price schedule and an escalation to bill the sales order. After you set up automated billing, the price schedule line is copied to a sales order. Set up an escalation that monitors conditions that indicate that the milestone is met and then sets the sales order to a billable status.

You can view information about all sales orders for a customer agreement in the View Sales Orders window. For example, you can view which milestones were billed and which milestones are pending billing.

Continuous billing of work for price schedules:

To optimize revenue collection and billing efficiency, you can continuously bill customers for work that is associated with a customer agreement price schedule. You can bill for work on a customer agreement even if an existing bill batch for the same customer agreement is not completed or closed.

Ensuring that duplicate lines are not billed

The following controls are in place to prevent duplicate lines from being billed:
- Bill lines that are disputed or on hold can be copied to a new bill batch if the original bill batch is billed or canceled. This rule applies to work orders that are set up for partial billing. *Partial billing* means that completed work is included in a bill batch even if the status of the work order is not Complete.
- Bill lines that are being copied to a bill batch or are part of a failed copy process cannot be copied to another bill batch. You should allow the copy process to finish, or restart a failed bill copy process.

Special pricing: fixed price quotes and not-to-exceed price quotes

The following rules apply to bill lines to ensure that the customer is not billed more than once for the price that is on a price quote:

- Transactions on work orders that specify amounts from price quotes cannot be in multiple open bill batches. Transactions that are added to a work order during the bill review cycle can be copied only to an existing bill batch. If transactions are not added to an existing bill batch during the review cycle, they can be added to a new batch only when the previous bill is billed or canceled.
- After a fixed price quote work order is billed, new transactions show a bill price and price quote amount of zero. The customer is billed the full amount of the price quote with the first billed work order.
- After a work order with a not-to-exceed (NTE) price quote is billed, new transaction prices are totaled. This result is subtracted from the remaining NTE price quote balance.
  - If the new total is a negative amount, the new total (a credit) is billed.
  - If the new total is greater than the NTE price quote, then the billed amount is the NTE amount minus the previously billed amount. The billed amount is zero dollars if the difference is less than 0.
  - If the previously billed amount plus the new total is less than or equal to the NTE price quote, then the new total is billed.
- If the type of quote or the quoted amount changes after the work order is completed but before it is billed, the total price on the work order is compared to the NTE price quote. If the total price on the work order is less than the NTE price quote, the total price is billed. If the total price is more than the NTE price quote, the NTE price quote is billed.

Removal of price schedules

If the price schedule is removed from its association with a work order and bill batches are open for the work order, bill batch totals are recalculated to remove the work order prices. The status on the bill lines in the bill batch is set to Removed.

Specifying special pricing on a price schedule:

Special pricing rules can be specified on price schedules. You can specify included or minimum pricing thresholds to indicate whether some work is to be included. You can specify that pricing comes from price quotes. Special pricing can be added to price schedules if you do not intend to bill for completed work on open work orders.

Procedure
1. In the Customer Agreements application, select the customer agreement that you want to add special pricing to.
2. Select a price schedule in the **Price Schedules** table.
3. On the Price Schedule subtab of the **Price Schedules** tab, add the special pricing details to be applied to the selected price schedule. You can enter either included pricing, or minimum pricing, or price quotes.
4. Save the price schedule.

Results

The special pricing parameters are applied to costs when the price schedule is applied to work orders. The costs are recalculated based on the special pricing before the customer is billed for the work.

Included and minimum pricing thresholds:

Pricing thresholds are limits that determine if some work on work orders is included in the charge to the customer or if the customer is charged a minimum amount regardless of the amount of work completed.

You can specify included pricing thresholds or minimum pricing thresholds. You cannot use pricing thresholds with price quotes, and you can add only one included or minimum pricing threshold to a price schedule. The included and minimum pricing values are calculated when the customer agreement that contains the price schedule is applied to a work order. The calculated cost becomes the actual cost that is charged to the customer.

Included pricing

With including pricing, you specify the amount of the cost of work to be included automatically without a charge to the customer. You can set included pricing thresholds for the cost of an entire work order, or for the cost of labor, services, materials, or tools on the work order. The customer is billed only for the amount that the total price on a work order exceeds the amount specified as the included amount.

For example, the total included amount for a work order, based on the terms of agreement between the service provider and the customer, is $400®. If the total calculated price on the work order is $600, then the customer is billed $200, the amount that exceeds the included amount.

Minimum pricing

With minimum pricing, you specify a minimum cost for work that results in charges to customers. You can set minimum pricing thresholds for the cost of an entire work order, or for the cost of labor, services, materials, or tools on the work order. If the total price for the work order is less than the amount specified as the minimum amount, then the customer is billed the minimum amount. If the total for the work order is more than the minimum amount, then the customer is billed the work order total.

For example, the minimum amount charged for a work order, based on the terms of agreement between the service provider and the customer, is $400. If the total calculated price for the work order is $250, then the customer is charged $400.

Bills for completed work on open work orders:

You can specify that partial billing is allowed for a price schedule. Partial billing means that completed work on a work order is included in a bill batch, even if the work order remains open. Work can be billed as soon as transactions are recorded on the work order, so work orders can be kept open for the duration of a project. Project-related costs can be billed as they are reported.

For example, work orders for both small and large projects are closed when the work is accepted by a customer. Project work orders include labor, material, and services that are added to the project work order when the purchase order is processed. Often, charges are applied to a work order after billing is completed. Therefore, when an approved transaction is added to a work order that is billed, the transaction is included in the next bill batch.

You can view the status of work order transactions in relation to the billing cycle on the **Customer Billing** tab of the Work Order Tracking application. Work order transactions can have the following statuses in relation to the billing cycle:

Table 20. Statuses of work order transactions

Status	Description
None	No transactions were billed.
Partial	Some, but not all, transactions were billed.
Complete	All transactions were billed.
Incomplete	The work order or service request was completed, but new transactions that are not yet billed were added to the work order.

You indicate that partial billing is allowed for work orders that are associated with a price schedule by selecting **Bill Approved Work** on the price schedule. You cannot bill for completed work on open work orders if special pricing, such as included pricing, minimum pricing, or price quotations, is used on the price schedule.

If **Bill Approved Work** is selected, when you create a bill batch you can choose to bill open transactions based on financial period. In this case, you specify the financial period for the bill batch. Then, the bill batch includes work order transactions if the financial period on the transactions is earlier than or equal to the financial period specified.

If you choose not to bill by financial period, there is no date check on the work order transactions. In this case, transactions are billed as they are entered and approved. If a transaction is added to a work order after it is billed, that transaction is billed separately in the next bill batch.

The billing history of a work order shows the amount that is billed for the work order in each bill batch that included transactions from that work order.

A price schedule cannot be removed from a work order after any transactions on the work order are billed.

A transaction on a work order is considered billed when the following criteria are met:
- The bill batch that the transaction is included in has a status of Billed.
- The bill line of the transaction is approved or resolved.

Example

Blackacre, Inc. is a facilities management company that provides building and office maintenance services, including custodial services and minor repairs. Blackacre Inc. also manages medium-size to large-size construction projects. Many

of the projects are tracked with a single work order for all of the work on the project. The work order is kept open for the entire project. The customer is billed by week or by financial period for the transactions that are recorded in that week or financial period.

Examples: Partial billing for project work:

You can specify that partial billing is allowed for a price schedule. Partial billing means that completed work on a work order is included in a bill batch, even if the work order remains open. Work can be billed as soon as the transactions are recorded on the work order. This means that a work order can be kept open for the duration of a project. Project-related costs can be billed as they are reported.

Example of partial billing each week

Blackacre, Inc. is a facilities management company that provides building and office maintenance services, including custodial services and minor repairs. Blackacre Inc. also manages medium-size to large-size construction projects.

Many of the projects are tracked with a single work order for all of the work on the project. The work order is kept open for the entire project. The customer is billed every week for the labor, materials, services, tools, and fees that are recorded for the project that week. The customer is billed on one bill batch for project-related work. This bill batch is separate to the bill batch used to bill the customer for non-project related work orders, tickets, and sales orders.

The billing administrator creates two bill batches for this customer. The first contains only the project work order. After that bill batch is moved to the BILLED status, the second bill batch includes all other work orders, tickets, and sales orders that are linked to the customer agreement.

Example of partial billing by financial period

Blackacre Inc. is managing a construction project for a customer. As in the previous example, all of the project work is tracked with a single work order that is kept open for the entire project. However, this customer requires that open work orders for this project are billed by a designated financial period. The customer is billed for the labor, materials, services, tools, and fees that are recorded during or before that financial period. Project work order is billed on a one bill batch. Non-project related work orders, tickets, and sales orders is billed on a separate bill.

Customer pool agreements:

Customer pool agreements are customer agreements that are used with the delivery, pricing, and billing of services for maintenance, exchange, and repair of pool parts.

Pool agreements specify the pool parts, participation fees, prices that are charged for pool services, and billing options. Pool agreements can be applied and matched to tickets and work orders for pool services. Pool agreements can be referenced on service level agreements (SLAs) that define the service delivery commitments and related credits and penalty fees. Agreements can also be referenced by response plans that define repeatable service responses and actions.

Price schedules for pool services

You specify pool information on price schedules that apply to work orders and tickets for exchanges or replacement of pool items. Other types of price schedules cannot be associated with part pools.

On the **Scope of Work** tab of the customer agreement, you specify the pool identifier and parts that the pool can contain. On the **Pool Items** subtab of price schedule, add parts from the specified pool to this agreement. Either specify individual pool parts or select the option to include all parts from the pool.

When the agreement is applied to work orders or tickets for this customer, the pool and pool parts on each record are part of the matching logic that selects the correct price schedule. A price schedule that specifies one part in a pool can be matched only to work orders or tickets for that part. A price schedule that specifies all parts in a pool can be matched to work orders or tickets for any of those parts.

Work orders and tickets for pool services

On work orders and tickets for customers, you can specify a pool part that is used in exchange or repair services. When the customer agreement is applied to the ticket or work order, the pool and part is included in the matching criteria. The matching criteria for the pool and part is applied like the matching criteria for aircraft or equipment, locations, and configuration items.

If information on the ticket or work order matches information on a price schedule, the price schedule can be applied to the ticket or work order. A price schedule with specific values is more restricted than a price schedule with fewer or more general values. If more than one price schedule matches, the ranking value on the price schedule is used to select one.

Response plans and SLAs for pool services

You can create SLAs to specify the expected service levels and commitments that are related to pool services. When you specify a pool and part on an SLA, they are used as part of the matching criteria for applying an SLA to a ticket or work order. A matching SLA sets target dates on the work order or ticket that are based on the SLA commitments.

For example, you might establish a commitment to replace a part and deliver the equipment within a certain amount of time. Another commitment might be for the customer to deliver the part to you for repair or replacement within a certain amount of time. If a commitment is not met, a penalty fee or a credit can be applied when services are billed.

Similarly, you can create response plans that are related to part repairs or exchanges. Response plans specify predictable and repeatable responses to similar work requests. When you specify a pool and part on a response plan, they are used as part of the matching criteria when the response plan is applied to a ticket or work order. A matching response plan applies the plan responses and actions. The matching logic is the same as the logic for applying price schedules.

Applying NFF prices to work:

An allowed NFF (No Fault Found) rate for repair or exchange work can be specified on customer agreements. When the NFF rate is exceeded, NFF pricing can be applied and billed for the work.

If a part is sent for repair or exchange but is found to be in good working condition, the work can be categorized as NFF work. Customer agreements can specify that a certain *NFF rate*, or percentage of NFF work orders, is allowed. Work orders that exceed the NFF threshold can be billed with a price schedule that applies NFF prices. NFF prices might be the full repair cost for the part plus a markup amount.

The NFF rate is measured against work orders that are associated with the agreement. A system administrator can specify a minimum number of work orders for an agreement before the NFF rate is calculated. For example, if the minimum is 15, there must be 15 work orders for the agreement before the percentage of NFF work orders is calculated. The minimum is specified in the PLUSPMINWONFF system variable. The default value is 0. The system variable can be updated in the Customer Agreement options for the Service Provider settings in the Organizations application.

The following process describes specifying the NFF pricing on the customer agreement and applying it to NFF work orders.

1. On the customer agreement and price schedule for parts repairs or exchanges for this customer, the delivery manager creates a price schedule that applies to standard work orders for parts repairs. The manager also creates a price schedule that applies to work orders when the allowed NFF rate is exceeded.

   For example, to bill a higher price when the NFF rate is 5% or greater, the manager specifies 4 in the **NFF Rate** field of the agreement and then adds a price schedule for NFF pricing. This NFF price schedule specifies material pricing rules for the full cost of the repair part plus a markup amount of 15%.

2. On the work order for a part repair or exchange, the work manager applies the customer agreement that includes the price schedule for standard parts repair pricing. The part is sent for diagnostic tests and repair.

3. If the part is found to be in good working condition and does not need repair, the work manager and delivery manager determine if the work order meets the NFF criteria. If the work is categorized as NFF work, the **Part Failure** field of the work detail is updated to specify that there is no part failure.

4. When the work order is saved, if the allowed NFF rate is exceeded, a warning message displays. To add the extra NFF pricing to this work, the work manager deselects the applied price schedule and applies the price schedule that includes the NFF pricing.

   The process that identifies that the NFF threshold is exceeded also updates the **NFF Exceeded** field on the customer agreement.

Pricing rules on price schedules:

You can specify pricing rules on a customer agreement price schedule that calculate transaction prices for components of work orders and tickets. Pricing rules specify how discounts and markups to list prices impact the actual prices that customers are charged for work. The list prices for materials, services, and tools can come from an associated price book.

Services pricing rules:

Service pricing rules are used to create billing transactions for services reported on a ticket, work order, or sales order to which the price schedule is applied. You add services pricing rules to a customer agreement price schedule in the Customer Agreements application.

Specify pricing rules on the **Services** subtab of the **Pricing Rules** subtab, on the **Price Schedules** tab. Default calculation percentages are added to reported costs for service groups and services. A service calculation percentage overrides a service group calculation percentage. You can enter a positive or negative percentage value to apply a markup or discount to the standard service cost or price. You can enter a positive or negative percentage value to apply a markup or discount to the service cost. You specify the price book to be used for the service list price.

You can also apply a zero additional charge for any service. If you select this choice on a revised agreement when the original had a markup or discount, the markup or discount information in the revised record is deleted.

Tools pricing rules:

You specify pricing rules for a customer agreement price schedule in the Customer Agreements application. These pricing rules are used to create billing transactions for tools used on a ticket or work order to which the price schedule is applied.

Specify tools pricing rules on the **Tools** subtab of the **Pricing Rules** subtab, on the **Price Schedules** tab.

Default markups

Create a default markup percentage that is added to reported costs for tools. This percentage is added to reported tool costs when you have not created specific tool markups. You can enter a positive or negative percentage value to apply a markup or discount to the tool cost or price. You specify the price book to be used for the tool list price.

Tool markups

Create tools markup percentages that are added to reported costs for commodity groups or for commodity groups and commodities. Commodity markups override commodity group markups. Commodity group markups override default markups. Create the following types of markups:
- Specify the markup percentage and a commodity group. The markup is applied only to commodities in this group. Commodities in other groups receive the default markup.
- Specify the markup percentage, a commodity group, and a commodity. The markup is applied only to this commodity in this group. Other commodities in the group receive the default markup.

No charge

You can apply a zero additional charge for any reported tool use. A markup is not applied to a reported commodity or group. If you select this choice on a revised agreement when the original had markups or percentages, the markup and percentage data are deleted in the revised record.

Material pricing rules:

Material pricing rules apply to materials transactions on tickets and work orders. You specify material pricing rules on price schedules that can be applied to tickets and work orders.

Pricing rules for materials are specified on the **Materials** subtab of the **Pricing Rules** subtab of a customer agreement price schedule.

You can specify several types of pricing rules. When more than one type of pricing rule is specified and is applicable to material that is used on a work order or ticket, precedence rules are applied, as explained in the following sections.

Customer supplied parts or rotable equipment
　　If a customer supplies parts or rotable equipment that you use when you provide services, they are listed and priced in the Material Pricing table of the price schedule. The **Customer Provided** check box is selected. When the part is used on a transaction, select that check box on the transaction to apply the material pricing. If the check box is not selected in either record, but the part matches, the material pricing is applied. This pricing overrides any other specified price rules.

　　If a part quantity is specified here, only the quantity that is specified is priced by the value in this table. If more parts are used, they are subject to all other pricing rules.

Part commodities
　　You can specify a markup or a discount value to be applied to certain commodities in the Material Markup table. The markup or discount is applied if the transaction part is associated with that commodity or commodity group. If a zero value is specified for a markup, the cost of the part or material is charged as the price. If a zero value is specified as the discount, the list price is charged as the price. The markup for the commodity part overrides the part price from a price book.

Parts in price books
　　If a part price book is active for the part on a transaction, and the price book is associated with the price schedule, the price book amount overrides the default markup or discount. If a price book is associated with the price schedule but a part without a price book price is used on a work order, default markups or percentages are applied to the cost.

Parts in other categories
　　If none of the previous pricing rules apply, then the prices are applied by the default markups or discounts on the price schedule. Discount amounts are specified by entering negative values in the fields.

Labor pricing rules:

You specify labor pricing rules on a price schedule for a customer agreement. These pricing rules are used when you bill transactions that are created for labor that is used on a ticket or work order to which the price schedule is applied. Labor prices are calculated by the craft that is associated with the labor. A craft can have premium pricing applied.

Specify pricing rules on the **Labor** subtab of the **Pricing Rules** subtab, on the **Price Schedules** tab of the customer agreement.

For billable work, the labor cost is calculated either from the price book, the default markup percentage, the craft markup percentage, or the craft price. If specified, and if premium hours are reported, a craft price might be modified by premium pay rules.

You can specify several types of pricing rules. When more than one type of pricing rule is specified and is applicable to labor that is used on a work order or ticket, precedence rules are applied, as explained in the following sections:

Labor in price books

If a labor price book is active for the labor on a transaction, and the price book is associated with the price schedule, the price book amount overrides the default markup or discount. If a price book is associated with the price schedule but labor without a price book price is used on a work order, default markups or percentages are applied to the cost.

Default markups

Create default markup percentages that are added to reported costs for internal and external crafts. These percentages are added to reported costs when you have not created specific craft markups or craft prices for those costs. You specify the price book to be used for the labor list price.

Craft markups

Create craft markup percentages that are added to reported costs for internal and external crafts. Craft markups override default markups. After specifying the craft, specify whether the markup is for an internal or external craft. If the markup is for an internal craft, you specify the markup percentage. If the markup is for external crafts, select one of the following options:

- Specify the markup percentage and a vendor for the craft. The markup is applied only to this craft from this vendor.
- Specify the markup percentage and do not specify a vendor for the craft. The markup is applied to this craft from all vendors.

Craft prices

Create craft prices, or hourly rates, that are applied to reported hours for internal and external crafts or craft and skill combinations. For each craft or craft and skill, you specify whether the price is for internal or external crafts. Craft prices override craft markups and default markups. If you specify both a craft and a skill, the price is applied only to this skill level for the craft. Other skill levels for the craft receive the default internal or external markup. You also specify whether the price is for internal or external crafts or crafts and skills. If the price is for an internal craft, you specify the markup price. If the price is for external crafts, select one of the following options:

- Specify the vendor and the price to charge for this craft or craft and skill from this vendor. The price is applied only to this craft or craft and skill from this vendor.
- Specify the price and do not specify a vendor. The price is applied to this craft or craft and skill from all vendors.

Premium craft prices

A craft can be associated with premium pay rules. When the price schedule is created, you can specify that the craft prices are modified by premium pay rules when premium work hours are reported. The premium pay type can be an hourly difference, an increment, or a multiplier. For example, an electrician apprentice is associated with a premium pay rule that specifies a pay rate of 2 and a rate type of multiplier when work is done on a holiday. The base pay is $30.00 per hour. This craft is listed on a price schedule and premium billing is allowed. The electrician apprentice completes 6 hours of emergency work on a holiday. For these 6 hours, the craft price is billed at $60.00 per hour.

No additional charge

You can apply a zero additional charge for any reported craft usage. No markup or special price is applied to reported crafts. If you select this choice on a revised agreement, when the original had markups or percentages, the markup and percentage data are deleted in the revised record.

IT equipment performance-based price schedules:

You can bill for the performance of IT equipment that are measured with key performance indicators (KPIs).

You create KPI pricing rules on the **KPI** tab of the **Pricing Rules** tab of the price schedule. Specify the KPI by which you measure and price performance, then specify a price for a measurement that falls within each KPI range:
- Price when the measurement is in the target range for this KPI
- Price when the measurement is in the caution range for this KPI
- Price when the measurement is in the alert range for this KPI

Prices can be positive for incentive revenue or negative for penalty payments.

Fee transactions on sales orders contain the name of the KPI and the KPI measurement. The total fee price on the sales orders is calculated by comparing the measurement on the sales order to the measurement ranges that are specified for the KPI pricing rules on the price schedule. The price that corresponds to the measurement range is added to the sales order. A sales order can have only one fee for a KPI.

Service level agreement (SLA) breach pricing rules:

You can bill or credit your customers and suppliers when SLA commitments on tickets or work orders are breached. Specify pricing rules for SLA breaches in a price schedule on the customer agreement. The penalty or credit is billed with a sales order.

You can create SLAs to specify the expected service levels and commitments that are related to services that you provide or require. An applied and matched SLA on a ticket or work order sets target dates that are based on the SLA commitments. For work orders, commitments might be target start, finish, or delivery dates. For tickets, commitments might be target response, resolution, delivery, or availability.

When an SLA commitment is not met, a penalty or credit can be issued to compensate for the breach of the SLA commitment.

For example, you agree to replace an aircraft or equipment part for a customer and the customer must deliver the unusable part to a designated location within 3 days. The target delivery date is specified on an SLA and this SLA is matched to a work order for the customer. If the target delivery date is exceeded, the SLA commitment is breached and you can bill the customer for the breach.

You specify pricing rules for SLA breaches on price schedules. The price schedules apply to sales orders. On the **SLA Penalty** tab of the pricing rules, you associate an SLA and commitment with the price schedule. The SLA must be associated with this customer or with no customers. Specify the type of fee. If you specify a calculated fee type, add the penalty calculation expression. You can specify a maximum amount that can be charged for each SLA breach.

In the SLA Breach application, you review breach commitments and create sales orders to bill penalty fees for selected breaches. In the Sales Orders application, you can issue credit amounts if you breach a commitment to a customer.

Sales orders:

Sales orders are used to bill for services such as management fees, trip charges, SLA penalties and credits, warranty claim credits, project milestones, and IT equipment performance fees.

Sales orders are created in the Sales Orders application.

Fees and charges

Sales orders are created automatically when a billing schedule is run at its specified schedule. You can set up billing schedules for recurring costs for parts, services, fixed fee charges, and actual and scheduled usage. You also can bill for equipment that you manage. The pieces of equipment are associated with classifications and additional prices are specified for the attributes of the classification. When the billing schedule runs at its scheduled time, sales orders are created for the costs that are associated with the billing schedule. The sales orders are then applied to a bill batch for the billing schedule and the customer is billed for the recurring costs.

If you create a sales order to bill for IT equipment performance, you specify information about the KPI that references the equipment. You apply the agreement and price schedule and the system calculates billing prices.

Project milestones

Sales orders are created automatically for price schedules that specify project milestone billing. You set up the milestone bill amounts and project details on the price schedule. When the price schedule is approved, a sales order is created for each milestone. When the work that is matched to the price schedule is complete, the bill batch for the sales order can be created.

Service level agreement (SLA) penalties and credits

To bill for penalty fees for breaches of SLA commitments, you review breaches and create sales orders for them in the SLA Breach application. Pricing rules for breaches of SLA commitments are specified on an associated customer agreement and price schedule.

To bill for credit amounts if you breach an SLA commitment, create a sales order in the Sales Orders application.

Warranty claim credits

On sales orders, you can reimburse your customers for work that is billed and paid but is covered by a warranty contract. Since the associated work order is closed, the delivery manager can specify information about the warranty credit, but cannot change the financial transactions.

The sales order for the credit indicates that this is a credit for a warranty claim, and specifies the work order identifier. In the fees and charges section, the credit amount is specified.

Specifying list prices with price books

You can create price books to specify and manage the list prices of parts, services, labor, and tools. You can specify different pricing levels for different customers and situations. You can specify that some prices are calculated based on the characteristics or attributes of the provided services. You can easily modify prices without having to maintain prices for each potential configuration of services.

Price books:

Price books are catalogs of list prices for parts, tools, labor, or services that are used in your business. Price books contain list prices, which can vary depending on the customer and the situation, such as time of day that services are provided. Price books can specify that some prices are calculated based on the characteristics or attributes of the provided services.

The prices in price books can be used when prices for materials, services, labor, or tools on work orders are applied by price schedules, or when prices for recurring costs are applied by billing schedules.

You create and revise price books in the Price Books application in the Inventory module. A price book list price is the starting point for prices. Discounts and markups that are specified in customer agreement price schedules and billing schedules are applied to the list price in a price book to calculate the actual price that the customer is charged. For example, a price schedule might specify that in most situations, under this agreement, a customer receives a 15% discount from the list price, and in special situations, the customer receives a 30% discount. If the service is required at a location that is close to the service provider, then the discount might be increased to 30% when the price is calculated. If the call is at night, then the discount might be decreased to 10% when the price is calculated. You can have multiple price books as starting points. The actual prices for customers are calculated based on the list prices in the price books and any applicable markups or discounts according to price schedules or billing schedules in the customer agreements.

Each customer typically has at least four price books. There might be a price book for tools, a price book for parts, a price book for labor, and a price book for services. Additional price books can be created in each of these categories. For example, you might have a gold-level tool pricing and a silver-level tool pricing.

With a price book, you can easily increase or decrease the prices of all of the parts, tools, labor, and services included in an agreement. For example, if you want to increase your prices for holidays, you might create a price book for that type of

time period. You might increase all of your prices in that book by 5%. All of the discounts and markups that are specified in customer agreements would still be applied, but the base price that is used in the calculations would be 5% higher. You can also select individual parts, tools, labor, or services to mark up or discount the prices for.

You can add parts, tools, labor, or services to a price book, depending on the price book type. A price book is in effect when it is approved and during the time that is specified by the effective date and end date.

The **Customer Agreement** tab shows all of the customer agreements that reference the selected price book. The **Price Schedules** tab shows all of the customer agreements that have price schedules that reference the select price book. The **Billing Schedules** tab shows all of the customer agreements that have billing schedules that reference the selected price book.

Condition-based pricing of parts and service items:

You can specify condition-based prices for parts and service items in price books. In part price books, you can specify the condition rate and fixed price for condition-enabled parts. In service item price books, you can specify the price of services that are based on characteristics of an aircraft, piece of equipment, or location that work is done on.

The primary customer of the aircraft, piece of equipment, or location must be the customer on the customer agreement.

Conditionally priced recurring service items

Recurring services can be priced based on a characteristic of an aircraft, piece of equipment, or location that the service is provided for. In the price book, you specify the service, the aircraft, piece of equipment, or location and characteristic of the aircraft, piece of equipment or location. Specify a list price for the service and other charges that are based on one or more characteristics of the aircraft, piece of equipment or location. When the service and aircraft, piece of equipment or location and its characteristic are specified on a billing schedule, the price of the service is a combination of the list price plus the price of the characteristic of the aircraft, piece of equipment or location.

For example, lawn maintenance company bills its customers each month for trimming the grounds. This service has a base price of $100 on the billing schedule. An extra $50 per acre is added to the base price when the service is billed. The number of acres is a characteristic of the lawn trimming service. A customer with 15 acres is charged $100 + (15 acres at $50) for a total of $850 per month.

Conditionally priced work order parts

Parts that are condition-enabled can be priced by fixed condition or by condition rate in a price book. When a condition-enabled part is used on a work order, the list sales price of a fixed-condition part comes from the price book on the price schedule. The list sales price of a condition-rated part comes from the condition rate that is applied to the list price of the part at 100% condition.

For example, a transportation maintenance company bills its customers different prices that are based on the condition of the material that is used to fulfill a work order.

- Air filters are fixed-condition parts and the price book lists the prices for various conditions of the part. If a new air filter is used in a repair work order, the price is $100. If a used air filter is used, the price is $50.
- Steer tires are condition-rated parts. If a new tire is used to fulfill a work order, the full price condition rate applies and the price is $100. If a worn tire is used, the 60% condition rate applies and the price is $60.

Conditionally priced work order service items

Work order services can be priced based on a characteristic of an aircraft, piece of equipment or location that the service is provided for. In the price book, you specify the service, the aircraft, piece of equipment or location, and characteristic of the aircraft, piece of equipment or location. Specify a list price for the service and other charges that are based on one or more characteristics of the aircraft, piece of equipment or location. When the price schedule is applied to the work order, the service price is calculated from the list price plus the price of the aircraft, piece of equipment or location characteristic.

For example, janitorial services for a hotel can be based on a list price plus a price that is based on the characteristic of square feet of the location.

Condition matches on price schedules, SLAs, and response plans

When conditions and fields on a price schedule, service level agreement (SLA), or response plan match those on a ticket, work order, or sales order, the price schedule, SLA, or response plan can be applied to the ticket, work order, or sales order.

When a match exists between more than one price schedule, SLA, or response plan and another record, the **Ranking** value on the price schedule, SLA, or response plan is used to select one. A low numerical ranking value takes priority over a higher numerical value.

When a match exists with the following conditions, a price schedule, SLA, or response plan is applied to a ticket, work order, or sales order:
- The ticket, work order, or sales order matches the classification and internal priority that you specify in the conditions criteria.
- The ticket, work order, or sales order refers to one of the services or service groups that you specify as included.
- The ticket, work order, or sales order meets all the conditions that you specify in the conditions section.
- The ticket, work order, or sales order refers to the aircraft, equipment, or location, and parts pool or pool part that are specified. It is best to specify only one type of resource. Otherwise, a match is difficult to achieve because a match must be made for the values on all specified resources.

Applying price schedules, SLAs, or response plans

Price schedules, SLAs, and response plans can be applied to tickets, work orders, or sales orders with workflow or escalation processes, or by manually selecting an action to apply them from the recipient record. In some cases, you can remove an applied record and apply a different one.

Customer agreement templates

In the Customer Agreements application, you can create customer agreement templates to store values in fields that are common to multiple customers. Using a template to create a customer agreement minimizes data entry and improves efficiency.

In the Customer Agreements application, you can create a customer agreement template by selecting the **Is this a template?** check box. These templates can be used to create new customer agreements for customers. Customer agreement templates do not contain customer-specific information, so you can apply a single template to one or more customers.

Customer agreement templates can have a status of draft, active, inactive, or canceled. You can edit a customer agreement template when it has a status of draft or inactive. You cannot create revisions of a customer agreement template.

You can create a customer agreement from a customer agreement template by selecting the **Create Agreement from Template** action in the Customers application or in the Customer Agreements application. If any dates in the customer agreement template occur before the start date of the customer agreement, the dates are reset to the start date of the customer agreement.

Customer MRO agreements

On customer agreements for maintenance, repair, and overhaul (MRO) work, you can specify scope of work (SOW) details. Details include work activity dates, aircraft or equipment to be worked on, and work activities. Activity dates are copied to the work plan as target dates and can be used to schedule the work.

These contract details are specified on the **Scope of Work** tab of the customer agreement. Information that you specify applies to the customer agreement, and is not directly related to any pricing or billing schedule on the agreement. However, the agreement can apply pricing and billing information to associated work orders or packages.

Specify the type of agreement as MRO, and then you can specify information about the work to be delivered to the customer. Specify information about the part, aircraft, or equipment to be worked on and the agreed work activities. Specify related work orders or work packages.

The activity window for work dates can be fixed or flexible. Specify fixed dates if work requires a specified start and end date. Specify flexible dates if work can be done any time with a range of dates.

Customer services

To ensure that you provide the optimum level of customer service to your customers, you manage service requests, create solution records, and use the bulletin board application for communicating important messages throughout your organization.

Billing for services

In the Customer Billing application, you can create, modify, or view bill batches for your customers. For each billing period in the customer agreement, create a bill batch for completed or closed work and other fees and charges for the customer and agreement. You can review transactions before you send the bills to customers. You can allow customers to review bills in the Bill Review application.

You can set up price schedules that create bill batches for a billing period on a schedule or you can manually add eligible bill lines to a bill batch. If you create automated price schedules, they can specify that bill lines are grouped by order number, customer cost center, customer PO, or the reporting user.

You can use the **Update Customer References** action to update the customer purchase order and customer cost center fields on all work orders, tickets, and sales orders that are related to each bill line on a bill batch.

You can set up billing schedules that automatically create bill batches for recurring charges that are not part of transactional work on a work order or ticket. These bill batches are separate from the bill batches with transaction charges, but you can review and approve them with the same processes.

You cannot delete bill batches, but you can cancel them. The canceled bill batch is a history record.

Manually adding bill lines to a bill batch

To manually add bill lines from price schedules to a bill batch, use one of the options to copy or select work orders, tickets, and sales orders. Unbilled, closed, resolved, or completed work orders, tickets, and sales orders are copied to the table. Eligible records have a completed or resolved date on or before the bill end date. Records can be added to a batch when they reach the status that is specified in the billing options settings in the Organizations application.

If partial billing is allowed for a price schedule, completed work on a work order is included in a bill batch, even if the work order remains open. Work can be billed as soon as the transactions are recorded on the work order.

The billing lines might be added to a bill batch for the first time, or they might be lines from the previous bill batch that were disputed or on hold.

Work orders, tickets, and sales orders that can be added to bill batches

Searching for unbilled transactions

Transactions can be added to completed tickets and work orders after they have been billed. You can periodically search for unbilled ticket and work order transactions to ensure that transactions are billed appropriately. You can search for unbilled transactions in all work order and ticket applications with the **Advanced Search** feature.

Also, all ticket and work order transaction lines contain an identifier of the bill batch where the transaction is billed. If the field is empty, the transaction is not billed.

Adjusting bill prices

You can adjust bill prices in several ways:
- You can change original transactions in the work orders, tickets, or sales order. Changes that you make to transactions in those applications might result in a recalculated agreed price.
- You can adjust the billed price value. If you change the billed price, the agreed price is not changed, but the price that is billed to the customer is changed.
- You can reduce bill line prices by a percentage to reduce the bill total price without modifying the bill line transactions. You can set a bill line price to zero by reducing the bill line percentage by 100%. User and history information is retained for the most recent adjustment.

Reducing bill line prices by percentages

Sales tax

The Customer Billing application has fields where you can add custom tax calculations. You can also connect with a product that calculates sales tax. Sales tax is often calculated by using information such as the type of revenue and the address where the service is rendered. The product does not calculate sales tax.

Sales tax calculations

Changing line and batch status

After you review a bill batch for accuracy and completeness, change the status of lines as needed and change the status of the batch to Prebill. If the bill batch contains lines you do not want to bill, change the status of the line to Hold. The batch now is available to the customer to review in the Bill Review application.

Customer reviews

You can provide your customers with access to their bills in the Bill Review application. The customer does not see bill lines with a status of Hold or Removed.

The customer can change line status. Disputed lines require remarks by the reviewing customer. Lines with the Reviewed status are available for your review and final bill tasks.

Final review and billing

When you process a bill batch that a customer reviewed, you try to resolve any disputed lines. Change the status of these lines to Resolved or to Hold. After you complete the review, change the batch status to Billed.

In a bill batch with a Billed status, lines with an Approved or Resolved status are considered billed. You can send these bills to your accounts payable system.

In a bill batch with a Billed status, lines with a Hold or Dispute status are not billed. They are included in the next bill batch if they are eligible to be billed then.

Reviewing and completing bill batches

Recording bill payments

When a bill is fully or partly paid, you can record payment details by selecting the **Record Payment** action in the Customer Billing application and adding payment information. Multiple payment records can be added. Specify details such as the payment method, reference information, and the paid amount. All payment history is recorded.

When a bill is fully paid, select the **Paid in Full** check box. The bill status changes to Paid.

The bill contains an indicator about whether any payment is recorded for this bill.

Viewing billing, history, and revenue information

You can view several types of billing information:
- To view progress and details about lines that are copied to a bill batch, select the records on the **List** tab and select the **View Current Bill Batch Progress** action.
- To view the history of billing statuses for a bill batch, select the **View Bill Batch Status History** action on that record.
- To view the history of billing statuses for a billing line, select the **Bill Line Status History** icon on the line.
- To view work order totals and batch line status history, open the work order and select the **View** > **Customer Billing History** action.
- To view a report that summarizes all bill batches for a customer, select records for the customer in the List tab of the Billing or Bill Review application and generate the report.
- To view all revenue for a revision of a customer agreement, open the customer agreement and review the revenue details.

Working with bill batches

Bill batches are created for work that is associated with all revisions of a customer agreement in the billing period. Bill batches can contain transactions from completed work or for recurring charges and fees.

Reviewing and completing bill batches

After customers review a bill batch and set the status to Reviewed, you complete your review and finalize the bill batch in the Customer Billing application.

Procedure

1. In the Customer Billing application, select the reviewed bill batch and review all lines. Complete any of the following tasks as needed:
   - Resolve lines that the customer disputed. Disputed lines have remarks that help you resolve them. Typically, you resolve disputed lines by updating bill prices in the Customer Billing application. You also might update costs in the application that created the bill line. You cannot bill lines with a status of DISPUTE.
   - Hold certain lines: You might decide to hold certain lines and bill the rest of the batch. Lines with a HOLD status are not billed or shown in the review bill.
   - Advance WAPPR lines to APPR: Advance the status of these lines with the **Advance all WAPPR Lines to APPR** action.

- Initiate® another customer review: To initiate a new customer review, change the status of the bill batch to PREBILL again.

2. When you are ready to bill lines in this bill batch, change the status of the bill batch to BILLED. All lines in a billed bill batch with an APPROVED or RESOLVED status are considered billed. You can send these bills to your accounts payable system. Lines in a billed bill batch with a HOLD or DISPUTE status are not copied to a new bill batch unless the previous bill batch is billed or canceled.

Billable work orders, tickets, and sales orders

Work orders, tickets, and sales orders are eligible to be billed on a bill batch if they meet certain criteria.

Billable work orders

Work order records include work orders, activities, changes, and releases. Some work orders allow *partial billing*, which means that unbilled, approved work on an open work order can be billed. Partial billing might be specified for large projects. Partial billing is allowed when the **Bill Approved Work** check box is selected on the price schedule that is associated with the work orders.

You can view billing status, billed costs and prices, and other details for a work order in the associated work order applications.

Bill lines that were billed previously and were on hold or were disputed are added to a new bill batch only if the original bill is billed or canceled.

Work orders cannot be in more than one open bill batch. A work order that is associated with the agreement is billable if it meets any one of the following conditions:
- The work order is associated with a price schedule that does not allow partial billing and it has the following characteristics:
  - It was closed or completed on or before the bill end date. The status that it must reach is specified in the Service Provider billing options of the Organizations application.
  - It contains no unapproved labor transactions.
- The work order is associated with a price schedule that allows partial billing and it has the following characteristics:
  - It reached the approved or later status on or before the bill end date.
  - It can contain unapproved labor transactions. Only approved transactions are copied to the bill batch.
- The work order was billed in a previous bill batch, but new, approved, transactions are added to the work order.

You can select transactions on approved work orders for the bill batch that is based on financial period. In this case, you specify the financial period for the bill batch. Then, the bill batch includes work order transactions if the financial period on the transactions is earlier than or equal to the financial period specified.

New transactions on a work order that is in a bill batch can be added to that bill if you use one of the Copy options in the Customer Billing application. If you add transactions, the bill line totals and work order price totals are updated.

If transactions are added to a work order that was billed, the new transactions are billed in a subsequent bill batch.

Billable tickets

Tickets include service requests, incidents, problems, and exchange orders. A ticket that is associated with the agreement is billable if it meets all the following criteria:

- It is in the status that is specified in the billing options. The minimum status that it must reach is specified in the Service Provider billing options of the Organizations application.
- It was completed on or before the bill end date.
- It contains no unapproved labor transactions.

Billable sales orders

A sales order that is associated with the agreement is billable if it meets the following criteria:

- It is in the status that is specified in the billing options. The minimum status that it must reach is specified in the Service Provider billing options of the Organizations application.
- It was completed on or before the bill end date.

Price adjustments to bill lines

You can reduce bill prices by reducing bill line prices by a percentage amount.

In the Customer Billing application, you can reduce a bill price to an agreed price by adjusting the bill line prices of a bill batch. You do not need to adjust each transaction on the bill line; you can reduce a bill line by a percentage. You can set a bill line price to zero by reducing the bill line percentage by 100%.

Select the **Bill Line Percentage Adjustment** action to adjust the bill line. All adjustments require descriptive text about the change. The logged-in user that adjusts the bill line is recorded. History information about the last manual price change and date of change is also recorded.

The action is available when the bill line status is Waiting Approval or Disputed.

If new transactions are copied to a bill line after a percentage adjustment is made, the same adjustment is made to the new transactions.

You cannot adjust a negative bill price with this feature.

Sales tax calculations

Sales tax rates and the rules for calculating sales tax differ from region to region and change frequently. Many service providers have tax calculation processes in their accounting systems or have interfaces between their accounting systems and commercial products that calculate tax.

The Customer Billing application has fields that you can use to add custom tax calculations. You can also connect with a product that calculates sales tax. Sales tax is often calculated by using information such as the type of revenue and the address where the service is rendered. The product includes data fields that you can use to manage this information but it does not perform sales tax calculations.

A service provider might be responsible for calculating a city tax with one tax rate, and a county tax with a different tax rate. In such situations, commercial products that calculate tax often include address validation. Address validation ensures that sales tax is calculated correctly. When addresses are validated, a code is often provided to indicate the various taxing jurisdictions. This code is used to calculate the total tax to be charged to the customers and to facilitate storage of the tax liability for each jurisdiction. In the product, this code is the geocode. The geocode is part of the service address.

Because the service address is copied to the ticket or work order, the geocode is also included on all detail transactions that are sent to the accounting system. These detail transactions include the price that was calculated according to the price schedule for the customer agreement. These detail transactions include additional fields that can store calculated taxes for up to six tax jurisdictions for each transaction.

Tax calculations are performed after the transactions are entered in the accounting system. Each transaction has the following information that is used in the calculation:

- Taxing geographical code.
- The type of revenue:
  - Labor, including labor type.
  - Material, including commodity.
  - Service, including type of service.
  - Tool usage, including commodity.

After the taxes are calculated, the results of the calculation can be stored in the additional tax fields in the detail records.

Bill batch line status

Bill batch lines can have various status values, depending on the stage in the billing process. You can change the line status, view a history of all status changes made to the line, and view a summary of the lines that require review or other action before the bill batch status can be changed.

You can set the status of work order bill lines on the **Customer Billing** tab of the Work Order Tracking application or in the Bill Batch Lines section of the Customer Billing application. When you change the bill line status of a work order in the Customer Billing application, you can specify whether the **Next Bill Line Status** field is updated on the related work order record. This applies only when you change the bill line status of a work order to or from a status of HOLD or DISPUTE.

The following table shows the bill batch line status values:

Table 21. Bill batch line status values

Status	Description
WAPPR	Waiting for approval. The status of a new bill line when it is added to a bill batch. You review lines with this status to ensure accuracy. The customer then reviews these lines and typically advances the lines to APPROVED. Bill prices for lines with this status are included in the pre-tax total of the bill batch. Reviewers also can change lines with this status to HOLD or DISPUTE. The customer that performs the review can change the status to DISPUTE or APPROVED. Bill batch lines in WAPPR status are included in the pre-tax total of bills.
HOLD	Hold from billing. You assign this status to lines to prevent the line from being billed until you can take further action. The customer cannot view lines with this status in the Bill Review application. Bill prices for lines with this status are not included in the pre-tax total of the bill batch. Lines with this status can be included in the next bill when the original bill either has a status of BILLED or CANCELED. Reviewers can change lines with this status to WAPPR, DISPUTE, RESOLVED, or APPROVED.
APPROVED	Approved by customer. The customer has reviewed and approved this bill line. Bill lines with this status are included in the bill batch when the status of the bill batch is BILLED. Bill prices for lines with this status are included in the pre-tax total of the bill batch. Reviewers can change lines with this status to HOLD or back to WAPPR. Bill batch lines in WAPPR status are included in the pre-tax total of bills.
DISPUTE	Customer disputes. The customer disputes the validity or price of a bill line. Each bill line with this status must contain remarks or a memo in the **Memo** field. Bill prices for lines with this status are not included in the pre-tax total of the bill batch. Lines with this status can be included in the next bill when the original bill either has a status of BILLED or CANCELED. Reviewers can change lines with this status to RESOLVED, HOLD, or WAPPR.

Table 21. Bill batch line status values (continued)

Status	Description
RESOLVED	Resolved for billing. A line with a DISPUTE or HOLD status is resolved. Lines in RESOLVED status are included in the bill batch when it is billed. Bill prices for lines with this status are included in the pre-tax total of the bill batch. Reviewers can change lines with this status to HOLD or to back to DISPUTE.
REMOVED	Removed from bill batch. The customer agreement and prices are cleared from the work order, ticket, or sales order and that record is no longer associated with the bill batch. Bill prices for lines with this status are not included in the pre-tax total of the bill batch.

For customers: Reviewing bill batches from your service provider

Your service provider can enable you to review bill batches before a final bill is sent. You review bill lines and approve them or request changes to them. When the review is complete, change the status of the bill to Reviewed.

Procedure

1. In the Bill Review application, on the **List** tab, select the bill to review.
2. From the **Bill Review** tab, select one of the following options to approve or dispute bill lines:
   - To approve all lines, select the **Advance all WAPPR Lines to APPR** action.
   - To approve or dispute individual lines, on each line, click the **Change Status** icon and specify a new status. If you dispute a bill line, add information to the **Memo** field.
3. After all bill lines are reviewed, change the status of the bill. From the menu, select **Change Status**, and change the status to **Reviewed by Customer**.

Results

The reviewed bill is available for further processing by your service provider. Approved lines become part of the next bill statement. Disputed lines are sent to the service provider for further review. All unbilled transactions are carried forward for potential inclusion in the next bill batch.

Customer bill batch reviews

Customers can review bill batches to resolve questions before a final bill is sent.

Bill batches are reviewed in the Bill Review application. Each bill batch for a customer agreement contains unbilled transactions that occurred during the billing period. A bill batch might also include transactions from earlier review bills that you disputed and the service provider reviewed and resolved.

Each bill batch line can contain bill prices for the following transactions and fees:
- Labor

- Materials
- Services
- Tools
- Fees and charges

As you review price details for a batch line, you approve or dispute the line prices by changing the status of the line. After you review all batch lines, you change the status of the review bill to reviewed. Approved lines on reviewed bills become part of the next bill statement. Disputed lines are sent to the service provider for further review. All unbilled transactions are carried forward for potential inclusion in the next bill batch.

Terms and conditions from the associated customer agreements are printed with the final bill. You can view terms and conditions that are associated with the agreement on the **Terms and Conditions** tab.

Viewing costs on bills

Some customers can view costs for lines in a bill batch that they are reviewing. Your service provider must enable this view on your customer agreement.

Procedure

1. In the Bill Review application, on the **List** tab, select the bill batch.
2. On the **Bill Review** tab, select the action to **View Costs**.
3. Click **OK** to close the window.

Exchange orders

Exchange orders manage requests from customers as part of a customer pool management agreement. You can track the request, and receive and fulfill orders for parts that you supply from a pool. For example, you might receive a request to supply a replacement for an airplane cabin sensor that malfunctioned.

Exchange Orders application

You use the Exchange Orders application to create and manage exchange orders as part of a customer pool management agreement. You can create and track exchange orders and receive and fulfill orders for parts that you supply from a pool.

In the Exchange Orders application, you can track all stages of the exchange order process. For example, creating and fulfilling an exchange order might involve the following stages:

- An airline has a defective part that was bought from your organization that needs to be replaced. A representative from the airline contacts the order desk at your organization and requests an exchange order.
- In the Exchange Orders application, the pool manager creates an inbound shipment request to request and receive the defective part from the customer. The request is sent to the shipping clerk.
- In the Shipments application, the shipping clerk approves the inbound shipping request, creates a shipment for the shipment request, and the airline returns the defective part.
- The part is recieved in the Receiving and Inspection application, and the part is sent for repair. When the part is fixed, it is sent to a pool.

- In the Exchange Orders application, the pool manager creates an outbound shipment request to have the replacement part sent to the airline. The request is sent to the shipping clerk.
- In the Shipments application, the shipping clerk approves the outbound shipping request, creates a shipment for the replacement part, and the replacement part is shipped to the airline.
- The airline is billed for the transaction fee and the cost to repair the defective part.

You can periodically update certain sections of an exchange order. For example, you can identify the priority of the exchange order and how fast the replacement part needs to be shipped to the customer. You can apply service level agreements so that related legal and contact information is readily available. All communication that is related to the exchange order can be stored in the **Log** tab.

Related information:

Customer pool agreements

Creating exchange orders

You create exchange orders to receive and fulfill orders that arise from a customer pool agreement. Your organization replaces and repairs the counterpart, and the customer is billed for the transaction cost and the cost of repairing the counterpart.

Procedure

1. In the Exchange Orders application, select the **New Exchange Order** icon.
2. Enter customer information in the Customer section, and in the Details section, add the number of the ordered replacement part to the **Ordered Part** field.
3. Optional: In the **Counterpart** section, add details about the counterpart that the customer returns for repair or replacement.
4. Save the record.

What to do next

You can issue replacement part from the storeroom by selecting the **Issue Part from Storeroom** action. You can send the part directly to the customer, or you can associate the exchange order with a work order to send the part to the customer. All work orders that are related to the exchange order inherit the pool and customer agreement terms that are associated with the customer who requested the exchange order.

On the **Shipments** tab, you can edit and monitor the progress of shipment requests and shipments for the exchange order.

Shipment requests for exchange orders

A shipment request is a formal request to either ship a replacement part to a customer as an outbound shipment request, or to receive a counterpart from a customer as an inbound shipment request. In the Exchange Orders application, you can create shipment requests for exchange orders and monitor the progress of the shipment request and shipment on the **Shipments** tab.

The system administrator can activate the functionality to have inbound or outbound shipment requests automatically created when the status of the exchange order is changed to INPRG. If this functionality is not activated, and if the exchange order is in the INPRG status, shipment requests can be created by

selecting the **Create Shipment Request** action. After the shipping clerk approves the shipment request, the shipment request and a shipment for the request appear on the **Shipments** tab. Some parts of a shipment request can be modified after the shipment request is approved by the shipping clerk.

On the **Shipments** tab, you can view a complete history of every shipment request or shipment that is associated with the exchange order. Shipment request lines and shipment lines cannot be modified in the Exchange Orders application.

Related tasks:

"Managing the shipment of parts" on page 200
When you create purchase orders and exchange orders, you create shipment requests for the shipment of parts. In the Shipment application, you review shipment requests and can combine shipment lines from different shipment requests to create shipments. Users can track the progress of the shipment requests and shipments on the associated purchase orders and exchange orders.

Creating estimates for customer work

You can provide price estimates for work that is requested by your customers. When a customer requests a service on an exchange order, you can plan your costs and prices, and then provide a price estimate that the customer can accept before work begins.

About this task

In a typical scenario, an order desk agent in your enterprise receives a service request, and then forwards details to a planner for more action. However, in some cases, you might want the agent to provide an estimate. If so, the agent adds a log entry for the price estimate to the service request, and it is visible to the customer. A price estimate that was added to an exchange order is not visible on any work order.

Procedure

1. In the Exchange Order application, open the exchange order for the customer.
2. On the **Exchange Order** tab, create a follow-up work order for the exchange order by selecting the **Issue Part to Storeroom** action, and add a work order number to the **Work Order** field. The plan on the work order is the basis for the price estimate.
3. In the work order plan, add details about planned operations and costs, and then apply a price schedule by selecting the **Apply Customer Agreement** action.
4. Select **Customer Price Estimate** to create the price estimate. The Customer Price Estimate window shows any existing estimates. If an existing estimate was accepted, and you create a new estimate, the status of the earlier estimate is set to reworked.
5. Optional: To create another estimate, click **New Customer Estimate**. You also can view and create estimates from the **Customer Estimate Log** tab of the work order.
6. Optional: If price quotes are not used with bills for this work, you can modify the calculated price estimate before you provide it to the customer. When included or minimum pricing is used, transactions are calculated individually, unless total included or minimum amounts are specified. Price estimates are calculated in the following ways:

- If minimum pricing is used, and the minimum amount for a transaction or total is more than the estimated price of a transaction or total, the minimum amount is used. If the minimum amount is less than the estimated price, the estimated price is used. Any fees are part of the estimated total price. The total is editable.
- If included pricing is used, and the included amount for a transaction or the total is more than the estimated price of a transaction or total, then the estimated total price is set to zero. The total is editable. If the included amount is less than the estimated price, then the included amount is subtracted from the estimated price and the result is editable.
- If fixed price quotes are used, the estimate is the quoted price. If not to exceed (NTE) price quotes are used, and the estimated price is less than the quoted price, the estimated price is used. Otherwise, the quoted price is used. Quoted prices cannot be edited.

7. Specify details about the estimate, such as a summary and the last date that the estimate is valid.

Results

When the record is saved, a log entry is added to original exchange order to specify the price and details that were added to the estimate. The order desk agent or planner can provide a more detailed estimate for each work order with the Customer Estimate report that is available from work.

On the exchange order, the customer can accept or reject the estimate by changing the status of the log entry.

Service level agreements on exchange orders

A service level agreement (SLA) between a service provider and customers specifies service commitments that the service provider agrees to meet. An applied service level agreement specifies commitments to meet and the escalation actions or notifications for each commitment.

Each SLA specifies such criteria as commitment and actions, ranking value, type of record that the SLA applies to, and whether the SLA is for an external customer, internal customer, or vendor. It can also include information about the effective dates, priority, affected person, classification, and service or service group.

For each commitment, you specify escalation actions or notifications that occur if the commitment is not met. Escalation processes can monitor all activities and send notifications or take other actions. For example, you might have a commitment for a Priority 1 ticket for a notebook that belongs to a senior executive. The commitment specifies a response time of 5 minutes and resolution time of 15 minutes. If the response time is not met, an email is sent to the ticket owner.

Applying SLAs to exchange orders

There are several ways in which SLAs are applied to exchange orders:
- An SLA might be applied by workflow or escalation process, or by another SLA.
- Select the **Apply SLA** action. An SLA is chosen and applied based on matching criteria.
- Select an SLA with the **Select/Deselect SLA** action.

One or more SLAs might be applied to an exchange order. Your system administrator determines whether you can apply multiple SLAs and which SLA updates the target time fields. SLAs can be chosen based on rank or on commitment stringency.

Matching SLAs to exchange orders

The SLA is applicable to records with values that match values on the SLA. The less specific the SLA, the more records to which it is potentially applicable, and vice versa. For example, if there is no customer specified on an SLA, the SLA can be matched to an exchange order for any customer. When you apply an SLA to a ticket, an SLA is selected based on the following cumulative information on both the SLA and the exchange order:

- Record type
- Customer
- Service or service groups
- Conditions
- Organization, site, a location, or a location within a specified location hierarchy
- Aircraft or equipment type or an aircraft or piece of equipment within a specified aircraft or equipment hierarchy
- Key performance indicators
- Parts pools

Response plans on exchange orders

You apply response plans to exchange orders to ensure predictable and repeatable actions and notifications for similar tickets, such as sending parts from the same pool when a certain customer requests an exchange order. Response plans also can assign certain data to tickets, such as owners, vendors, and ticket templates.

You apply response plans to exchange orders with the **Apply Response Plan** action. A response plan also can be applied by using a workflow or escalation process.

A response plan is selected based on conditions that match information in the exchange order. Each response plan specifies criteria such as the customer, internal priority, service groups, services, parts pools, and classifications that are matched to information on the exchange order. If more than one response plan is applicable, the ranking value on the response plan is used to select a response plan for the exchange order. When you apply a response plan to an exchange order, the **Vendor** field on the exchange order might be overwritten.

After a response plan is applied, the actions and notifications that are specified on the response plan are run automatically.

If you apply a response plan that has a restricted ticket template to a work order, the response plan is applied without the exchange order template. If the response plan has a restricted ticket template, you can select the **Stop Response Plan if Job Card or Ticket Template cannot be applied** check box so that the response plan is not applied to work orders.

Chapter 11. Safety and quality management

You can conduct audits and surveys to evaluate whether personnel and external suppliers are operating in a safe environment that meets quality standards.

Evaluating regulatory compliance by using audits and surveys

Audits provide a way to verify that personnel are complying with internal or external regulations. Surveys provide a method of assessing the safety climate and culture of an organization, or of gathering information in specific areas. You can use the resulting data to recommend follow-up actions.

Audits and surveys

You can use either audits or surveys to evaluate aircraft, equipment, and locations for regulatory compliance. To evaluate compliance with aviation regulations or with internal regulations, you can use audits.

To evaluate compliance with industry-related regulations or with internal regulations, you can use audits. You can conduct audits of aircraft or equipment to compare operations across locations. You can also request an external audit to acquire a level of confidence in the quality of the external provider.

To assess the safety climate and culture of an organization with the goal of improving health and safety, you can use surveys. You can also track the results of a survey that was conducted separately to ensure that follow-up actions are completed.

All of the audit or survey responses are calculated and displayed to authorized personnel as a summary at the header of the record.

When you conduct audits or surveys, you use questionnaires to gather the data. You formulate the questionnaires depending on the objectives of the audit or the survey. You can conduct the following types of audit or survey:

System audit or survey
> Gathers information about multiple processes that can affect multiple employees and departments.

Process audit or survey
> Gathers information about the processes, specifications, and systems in a specific department.

Product audit or survey
> Gathers information that is observed during inspection or maintenance activities.

Compliance audit
> Gathers information about compliance with regulatory requirements.

People audit or survey
> Gathers information about the skills of employees and vendor employees.

You can analyze the resulting data to determine the current level of safety in the workplace. You can analyze the data to identify new areas for improvement. You can also use the results to analyze the level of involvement of employees with

health and safety issues. Developing good organizational practices that relate to safety can lead to the continued maintenance of a safe workplace and to the prevention of accidents.

You might find that you need to conduct a reaudit. You can specify that a reaudit is required, when the reaudit was conducted, and when it was completed.

Templates for frequently conducted audits and surveys

When you conduct the same types of surveys or audits, a template ensures a consistent process and format.

You can create a template from an existing audit and survey record. Using the **List** tab, search for an audit and survey record that corresponds to your current goals, and specify the record as a template. You can also create an audit and survey record from an existing template.

A record that is specified as a template must have a status of Draft.

When you create a record from an existing audit and survey record, only certain fields and their values are duplicated. Those fields and their values are copied from the originating record to the new record. Some fields and their values, such as the fields in the **Findings** tab, are not duplicated. The results of each audit or survey are unique to that audit or survey.

Audits and surveys and service requests

An audit or a survey might require a service request as a follow-up action. You can create a follow-up service request from an audit and survey record. The service request number displays in the **Related Records** tab of the Audit and Survey application.

In the Service Requests application, the **Location**, **Aircraft or Equipment**, and **Description** fields from the originating audit and survey record are populated. You can add fields from the Audit and Survey application to the service request or remove fields from the service request by using the Domains application.

Audits and surveys and meters

You might need to add meter readings to track the performance of an aircraft, a piece of equipment, or a location that is associated with an audit or a survey. A meter is a device that is designed to measure time, distance, speed, or intensity. A meter can also indicate and record or regulate an amount or volume, such as the flow of a gas or an electric current.

You can record manual meter readings for an aircraft, equipment, or a location, including the names for the meters and the sets of attributes that describe the meters. An aircraft, equipment, or a location can be associated with multiple meters. You can update meter readings and review previous readings.

Audits and surveys and workflow processes

You can create workflow processes that reflect your business processes. A workflow process defines the actions and the notifications that can occur at different points in a business process. You can manage the movement of a record through a process from start to finish. You can instruct individuals to act on

records, ensure that individuals act in a timely manner, and ensure that an audit trail exists for each record and process. You use the Workflow application to plan, design, build, test, implement, and manage workflow processes.

For audits or surveys, you can create a workflow process to track the completion of an audit or a survey. You can have the workflow process notify you when the audit or the survey is complete. You might also create a workflow process that is based on the roles of team members, such as audit leaders or participants.

Scenario: Preparing and administering a safety climate survey

Workers in Company ABC often conduct safety climate surveys with the goal of improving health and safety. To assess the safety climate of an organization, Company ABC prepares a safety climate survey. Company ABC also develops a sample group and assigns the survey to the sample group.

Background

Company ABC plans to collect information from the survey by evaluating the answers to the formulated questions. Company ABC uses the survey to specify actions as a follow-up to the survey. Company ABC also uses the survey to encourage employee participation in identifying safety challenges.

Patricia, the Survey Leader, is responsible for creating the survey and for assigning personnel to complete the survey. Fernando, the Survey Assessor, is responsible for analyzing the results of the responses from the sample group. Fernando is also responsible for defining the actions that are to be taken as a follow-up to the survey. Andrea is responsible for carrying out the actions that result from the survey.

Preparing the data

Several of the following steps describe the data that must be prepared before you specify the information for a safety climate survey. You might want to specify the following information ahead of time:

- Aircraft by using the Aircraft application
- Equipment by using the Equipment application
- Locations by using the Locations application
- Operating procedures by using the Operating Procedures application
- Personnel by using the People application
- Regulations by using the Regulatory Compliance application

The data is then available when you are ready to specify the fields for the safety climate survey.

Step 1: Develop the questions

Patricia develops the questions for the safety climate survey. Patricia compiles a number of questions into sections. One of the sections is called SAFETY. The SAFETY section includes questions about whether employees are using hearing protectors and safety glasses around the equipment in a hangar. Patricia also develops the list of the employees to include in the survey, and assigns them to the MAINTENANCE sample group.

Step 2: Create the audit and survey records

Patricia uses the People application to authorize qualified, active personnel to approve the survey.

In the Audit and Survey application, Patricia creates an audit and survey template record SAFESUR with the type **Survey**. Patricia selects the **Survey Format** option. When the **Survey Format** option is enabled, the numerical value that Patricia assigns to the response for each question is hidden.

Patricia adds and describes each survey question in sequential order.

Patricia also specifies the members of the team who are to participate in the survey. This task is an optional step.

From the template record, Patricia creates the additional audit and survey records that are needed. Patricia also uses the Locations application to link the audit and survey records to the location of the hangar.

In the Workflow Process application, Patricia creates a workflow process to be notified when each person completes the survey.

Step 3: Submit the surveys

In the Audit and Survey application, Patricia sets the audit and survey records to Survey Entry status. Patricia sends out an email to notify employees and to request their participation. When participants complete the survey, they set the survey status to Survey Submitted. The workflow process that is in place notifies Patricia of the completion of each survey.

Step 4: Analyze the responses and specify corrective follow-up actions

After the results of the survey are in, Fernando uses the Audit and Survey application to analyze the answers. To focus attention on findings that are critical to safety, Fernando reviews the answers to the survey questions. Fernando adds the findings to the survey. For example, Fernando determines that employees are generally not using safety glasses and hearing protectors in the hangar. Fernando relates each finding, in sequential order, with the question that generated a response.

Fernando specifies a recommendation for each finding. Fernando suggests that a safety presentation be held. Fernando also suggests that training be provided to employees working in the hangar. When a finding is associated with a function that is critical to safety, he enables the **Safety-critical** check box.

As a follow-up to Fernando's recommendations, Fernando uses the Actions application to create and to approve an action that calls for safety presentations. Fernando also creates and approves an action that requests more safety training about protective gear. Fernando assigns Andrea to complete the actions.

Step 5: Complete the survey

After the safety presentation is held, and the safety training is provided, Andrea uses the Audit and Survey application to mark the actions as complete. Patricia

changes the status of the survey to Complete. Patricia uses the work log to record observations about this survey.

Creating audits and surveys

To identify ways to improve health and safety in the workplace, you can prepare audits and surveys that are based on the goals of your organization. You can use the results to target improvements in operating procedures or processes.

Creating audits

An audit is an examination of how work processes are conducted within an organization. When you create an audit, you specify the information about the context of the audit, and the personnel who are responsible for carrying out the audit. You can also define whether an audit is to be carried out by an external agency so that you can identify and track external audits.

Before you begin

Develop the questions that you are going to ask during the audit. You can divide the questions into areas of interest.

You can decide to create an audit that is based on the roles of the team. For example, you might have an audit for assessors, inspectors, participants, or audit leaders.

Procedure

1. In the People application, authorize personnel to approve audits.
2. If you are using the audit to test procedures, use the Operating Procedures application to create operating procedures. You can also use an operating procedure to develop the steps that are required for the audit.
3. In the Audit and Survey application, click **New Audit and Survey** on the toolbar.
4. On the **Audit and Survey** tab, select **Audit** for the type.
5. Specify the context of the audit, and the certification details.
6. On the **Questions** tab, add and describe the questions in sequential order.
7. In the **Line Score** field, assign a value to each of the questions.
8. On the **Audit Team** tab, specify the members of the team who are participating in the audit.
9. Save the record.

Creating surveys

A survey is a way of collecting information by evaluating the answers to formulated questions. Surveys are valuable for providing information about whether regulations are being followed during operational procedures or policies. You can use surveys to identify follow-up actions for improving the safety of the plant and its personnel.

Before you begin

Develop the questions that you are going to ask during the survey. Depending on the goal of the survey, you can compile a number of different questions into sections. For example, for a climate survey, you can have a section of questions about attitudes towards safety. You can create a section of questions about compliance with procedures and regulations. You can create sections of questions

that apply either to employees or to supervisors.

About this task

When you create a survey, you specify details about the context of the survey and the certifications that are required. You also provide the questions for the survey, and how often it must be administered. By specifying the frequency of the survey, you can correlate surveys across different dates, and compare the results.

When you create a survey record, you can select the **Survey Format** option. When the **Survey Format** option is enabled, the numerical value that is assigned to the response for each question is hidden. You can enable the **Survey Format** option before you change the status of the record to Entry status.

Procedure

1. In the People application, authorize personnel to approve surveys.
2. If you are using a survey to test procedures, use the Operating Procedures application to create operating procedure records. You can also use an operating procedure to develop the steps that are required for the survey.
3. In the Audit and Survey application, click **New Audit and Survey** on the toolbar.
4. On the **Audit and Survey** tab, select **Survey** for the type of record.
5. On the **Questions** tab, add and describe the questions in sequential order.
6. On the **Audit Team** tab, specify the members of the team who are participating in the survey.
7. Save the record.

Specifying corrective follow-up actions

To focus attention on findings that are critical to safety, you can review the answers to the questions. You can use the responses to recommend actions to take as a follow-up to an audit or a survey.

About this task

When the survey or the audit is in progress, you can analyze the results. You can add your findings based on the answers to the questions. You can relate each finding, in sequential order, with the question number that generated a response.

Procedure

1. In the Audit and Survey application, open the audit or the survey for which you want to specify findings and make recommendations.
2. Specify and describe each finding that resulted from an answer to a question that was asked.
3. In the **Sequence** field, specify the order in which the question displays in the survey or the audit.
4. Select the question that is associated with each finding.
5. Specify a recommendation that you can associate with each finding.
6. In the Follow-up section, specify whether the finding is associated with a safety-critical function.
7. For each finding, specify an action that is associated with the audit or the survey, and assign the person who is responsible for completing the action.
8. Save the record.

Updating meter readings for aircraft, equipment, and locations

You can update meter readings for aircraft, equipment, and locations on audit or survey records. You might need to update a meter reading to track the performance of an aircraft, piece of equipment, or location that is associated with an audit or a survey.

Before you begin

In the Meters application, you define meters and specify the aircraft, piece of equipment, or location where a meter is used. Meter definitions include the names for the meters as well as the sets of attributes that describe the meters. An aircraft, piece of equipment, or location can be associated with multiple meters. You use the Aircraft application, Equipment application, or the Locations application to associate an audit or a survey with an aircraft, piece of equipment, or location.

Procedure

1. Open the audit or survey record for which you want to update a reading.
2. From the **More Actions** menu, select **Enter Meter Readings**.
3. Update the meter reading in the **Aircraft or Equipment Meter Readings** tab or the **Location Meter Readings** tab. If the aircraft, piece of equipment, or location has meters, and the aircraft or piece of equipment inherits the meter reading for the location, enter a reading for either the aircraft or piece of equipment, or the location. If the aircraft or piece of equipment has child records that inherit meter readings, the meter readings for the child records are updated. If the location has aircraft or pieces of equipment that inherit meter readings for the location, the readings for the aircraft or pieces of equipment in that location are updated.
4. In the **New Reading** field, type a value.
5. Optional: If you want to change the name of the user updating the reading, specify a different value in the **Inspector** field.
6. To save the reading and return to the record, click **OK**.

Completing audits or surveys

When all of the actions that were specified as a follow-up to the audit or the survey are complete, you can close the audit or the survey record.

Procedure

1. In the Audit and Survey application, select the audit and survey record that you want to complete.
2. On the **Findings** tab, ensure that the actions in the Follow-up section are marked as complete.
3. Ensure that the name of the person who completed the actions displays, along with the date when the actions were completed.
4. On the **Audit and Survey** tab, specify the name of the person who completed the audit or the survey.
5. Change the status of the record to Complete, and save the record.

Classifying audits and surveys

You can classify an audit or a survey by linking it to a predefined classification. The addition of classification details to an audit or a survey makes it easier to manage audits and surveys in accordance with industry standards.

Before you begin

A classification must exist that is set up for use with audits or surveys.

About this task

You classify an audit or a survey by using the **Classification** field. This field is available on both the **Audit and Survey** and **Specifications** tabs of the audit and survey record.

If the classification belongs to a hierarchy, the associated classification path is shown in the **Classification** field, from the top-level node in the hierarchy down to the selected node. In addition, any attributes that belong to the selected classification are added to the Specifications table.

Procedure

1. In the Audit and Survey application, open the audit and survey record that you want to classify.
2. On the **Audit and Survey** tab or the **Specifications** tab, click **Detail Menu** on the **Classification** field and then select an option to retrieve the required classification.
3. Save the record.

What to do next

After you classify an audit and survey record, you can develop audit and survey specifications.

Creating specifications for audits and surveys

You can use specifications to define audits and surveys that are categorized according to predefined types. You can also use specifications to add standards-based information that is important for compliance with plant and industry standards.

Before you begin

A classification must be assigned to the audit or survey for which you want to develop a specification.

About this task

You create specifications for an audit and survey record by specifying values for the attributes that belong to the audit and survey classification. You can also add attributes that do not belong to the classification, but are relevant to the audit or the survey. The additional attributes and attribute values that you specify in the audit and survey record do not affect the original classification.

Procedure

1. In the Audit and Survey application, open the audit and survey record that you want to modify and go to the **Specifications** tab.
2. Select the classification that is assigned to the audit and survey record.
3. In the Specifications table, specify values for the attributes that belong to the audit or the survey classification.
4. Optional: Add new attributes and specify values.

5. Save the record.

Maintaining operating procedures

You use the Operating Procedures application to provide reference information about standards and procedures that are associated with job cards. You can associate standard actions with lines in an operating procedure, and you can assign ownership to operating procedures

Operating procedures apply to job card tasks and work order tasks. When tasks on a job card contain operating procedures, the operating procedures are copied to the work tasks on work orders that use the job card.

Related concepts:

"Maintaining operating procedures"
You use the Operating Procedures application to provide reference information about standards and procedures that are associated with job cards. You can associate standard actions with lines in an operating procedure, and you can assign ownership to operating procedures

Creating operating procedures

You create operating procedures to provide information about standards and procedures that are associated with job cards.

About this task

You can use the same identifier for multiple operating procedures, but the combination of organization, site, and procedure number must be unique.

Procedure

1. In the Operating Procedures application, click **New Operating Procedure** on the toolbar.
2. On the **Operating Procedure** tab, specify details, such as type and category of operating procedure.
3. Specify details such as the date and time when the operating procedure can be used.
4. On the **Procedure Lines** tab, specify the actions that are associated with lines in the operating procedure.
5. Use the **Log** sub tabs to relay important information to your team.
6. Save the record.

Tracking defects identified in audits and surveys

A defect causes operational aircraft or equipment to deviate from perfect operation. Defects do not have a health, safety, or environmental impact. You can document defects, associate solutions with defects, and generate follow-up tickets and work orders.

Defects overview

You can document and track defects, associate existing solutions with defects, and create draft solutions. You can record defective aircraft or equipment that do not comply with industry standards and regulations. You can link defects to audits that are conducted as the result of a nonconformance.

The following examples are defects:
- A noisy speaker in a cabin
- A flashing light at a passenger seat

If a defect requires a follow-up activity, you can generate the following types of records from this application:
- Action
- Defect
- Service request
- Work order

Defect records can also be created automatically from such sources as email, system monitoring tools, and external applications.

To record information about events that have a health, safety, or environmental impact, use the Incidents application.

The status of a defect indicates its position in the processing cycle and the actions that can be performed on the record. A defect can have one of the following status values:

NEW This status is the default status of a new defect. You can delete a record that has this status.

QUEUED
> Ownership of the defect is assigned to a person or person group. You can delete a record that has this status if it meets the following criteria:
> - It is not related to other records.
> - It does not have workflow history.
> - It does not have work log entries.

INPROG
> Work on the defect is in progress.

PENDING
> The defect is pending an external action, for example, a vendor or user callback or delivery of parts.

WOR Waiting on review. Someone must inspect the defect and decide what action to take. You can delete a record that has this status if it meets the following criteria:
> - It is not related to other records.
> - It does not have workflow history.
> - It does not have work log entries.

RESOLVED
> Information has been gathered and routed, service has been restored, or a solution has been provided. You can reopen a defect by changing its status from RESOLVED to INPROG.

CLOSE
> The defect is finalized. After the record is closed, you cannot change the status. After you cancel a defect, it becomes a history record and you can change it only by selecting the **Edit History Defect** action.

Related concepts:

You can document and track defects, associate existing solutions with defects, and create draft solutions. You can record defective aircraft or equipment that do not comply with industry standards and regulations. You can link defects to audits that are conducted as the result of a nonconformance.

Creating defect records

You create defects to document and track defects, associate existing solutions with defects, and create draft solutions. You can record defective aircraft or equipment that do not comply with industry standards and regulations.

Procedure

1. In the Defects application, click **New Defect**.
2. Optional: In the **Reported By** field, specify the person who reported the defect.
3. Specify the primary aircraft, equipment, or location. If the defect affects multiple aircraft, equipment, or locations, specify more information in the Multiple Aircraft, Equipment, and Locations window.
4. Optional: Specify details for the defect, such as the summary, the type of defect, and whether someone identified a solution to the defect.
5. Optional: In the associated tabs, specify the nonconformance details, the related tickets and work orders, and the solution details. You can also add classification information, and provide work log and communication log information.
6. Save the record.

Action tracking overview

Actions are agreements between organizations or different parties within an organization to track required work. You use the Action Tracking application to maintain action records and report the status of the work that is performed.

The issuance of requirements, advisory notices, or safety bulletins from regulatory agencies or manufacturers might lead you to create actions.

One organization performs the work and reports the status of the work to an external organization or another part of the internal organization. An external organization might be a regulatory agency. An internal organization might be a maintenance organization that is responsible for actions that arise from internal management audits.

In the Action Tracking application, you can perform the following activities:
- Determine the work that must be done to meet an action.
- Identify the aircraft or equipment that are affected by an action.
- Associate aircraft or equipment lists and standard action groups with an action.
- Generate task card records for the identified aircraft or equipment.
- Generate work orders for an action.
- Associate task card records and work orders with a work package.
- Track the status of work that is required to meet an action.
- Identify the people who are part of the review process.

Related concepts:

Actions are agreements between organizations or different parties within an organization to track required work. You use the Action Tracking application to maintain action records and report the status of the work that is performed.

Regulatory compliance overview

You can create regulation records to help comply with guidelines, standards, and legal requirements that apply to employee health and safety of the work environment.

You can associate active regulation records with planned and actual work in the following types of records:

- Aircraft
- Equipment
- Job card
- Location
- Work order

Related concepts:

"Regulatory compliance overview"
You can create regulation records to help comply with guidelines, standards, and legal requirements that apply to employee health and safety of the work environment.

Creating regulation records

A regulation helps your enterprise to comply with guidelines, standards, and legal requirements. When you create regulation records, you specify the context in which regulations are followed.

Procedure

1. In the Regulatory Compliance application, click **New Regulation** on the toolbar.
2. On the **Regulation** tab, specify the regulation for which you are creating the record, and the type of work to which the regulation applies.
3. Specify the regulation details, such as the regulatory authority, the region, and the country.
4. Specify the reference for any safety-critical element that is associated with the regulation, such as a performance standard.
5. On the **Where Used** tab, review the aircraft, equipment, locations, and job cards with which a regulation is associated.
6. Specify the date from which the regulation is valid.
7. Save the record.

Chapter 12. Managing procurement

The procurement of aircraft and equipment requires stringent control of all aspects of the purchasing process, of supplier information, and of the receipt and inspection of equipment.

Scenario: Purchasing parts

An airline needs to purchase new parts for their aircraft. The steps in the procurement process include creating purchase requisitions, creating purchase orders, receiving and inspecting parts, and recording invoices from vendors.

Step 1: Create the purchase requisition

In the Purchase Requisitions application, Juan, the storekeeper, creates purchase requisition 98761 for the following materials:

- Fifty engine mounts
- Twenty-five engine disks
- Three sets of landing gear

Robert, the financial manager, approves the purchase request before Maria, the purchaser, can create the purchase order to send to the vendors.

Step 2: Create the purchase orders

Maria creates the following purchase orders, one for each vendor, by using the **Copy PR Line Items to PO** action in the Purchase Orders application:

- Purchase order 98001 contains fifty engine mounts.
- Purchase order 98002 contains twenty-five engine disks.
- Purchase order 98003 contains three sets of landing gear.

In the Shipments application, on the **Shipment Lines** tab, Ben, the shipping clerk, selects the shipment lines that are associated with the purchase orders and approves them.

Step 3: Receive the parts

On Monday, Juan, the storekeeper, receives the three sets of landing gear on purchase order 98003. In the Receiving and Inspection application, he registers the quantity that is received and clicks the **Select Parts** button and specifies the landing gear details, for example, the landing gear's serial number.

The next day, the fifty engine mounts, and the twenty-five engine disks on purchase orders 98001 and 98002 arrive. Juan registers the quantities that are received and specifies the details for the parts. Before saving the receipt record, Juan reviews each row to ensure that all details are correct.

Step 4: Inspect the parts

Juan stores the parts in an inspection location until an inspection is conducted. Alex, the quality controller, inspects the parts, and in the Receiving and Inspection application, he updates the inspection status by selecting the **Change Inspection**

action. Alex identifies nonconformities in two of the engine disks on purchase order 98002. Alex sends the unserviceable parts to a quarantine area so that they are not installed on any aircraft.

Step 5: Quarantine the parts

Alex examines the parts again and discovers that a crack in one disk renders it unserviceable, and the disk needs to be returned to the vendor. After thoroughly cleaning the other engine disk, Alex determines that it is serviceable. In the Receiving and Inspection application, Alex updates the quarantine status by selecting the **Change Quarantine Status** action. He clicks **Accept Selected** for the serviceable part and **Return Selected** for the unserviceable part.

Alex moves the serviceable part to the serviceable storeroom after he accepts it. The unserviceable part remains in quarantine until it is returned to the vendor.

Step 6: Record vendor invoices

After Maria purchases the parts, the company receives invoices from the vendors. Maria uses the Invoices application to record the vendor invoices when they are received. When Maria creates the invoices, she can match the information with purchase orders 98001, 98002, and 98003.

Maria uses the **Copy PO Lines** action to copy lines from each purchase order to the **Invoice Lines** tab. Lines from each purchase order are copied to the invoice. Maria specifies the invoice details, for example, the date for the general ledger financial period.

In the Invoices application, Robert, the financial manager can approve the invoice that Maria created and route the invoice to Accounts Payable.

Creating purchasing requests

You create purchase orders in the Purchase Orders application. Purchase orders can be generated automatically by purchase requisitions and by requests for quotations. You can also create loan orders for parts that you receive on temporary loan from a supplier.

Creation of purchasing records

Purchasing records are created when a part or tool is purchased, loaned, leased, repaired, or exchanged from a vendor.

Planning and managing purchasing records

You can use the following records to plan, gather information, and manage the terms of your purchases:

Vendor certification
> A record that specifies the certification that qualifies the vendors to supply the parts that you require. In the Company application, you track vendor certifications to ensure that business operations are compliant with regulatory requirements. You need to specify which certificates from which authorities must be delivered so that the vendor can send them with the parts or tools.

Vendor approval

A record that specifies the service type, part type, and part status that a vendor is authorized to sell to the company. When you order a part or service, the vendor approval rules are checked and the part status is updated in the order lines to highlight any non-authorized transaction.

Purchase contract

A record that specifies the details of a purchase contract with external vendors. In the Purchase Contracts application, on the **Scope** tab, you can define and review the scope of the purchase contract, which includes the fleets, aircraft, pieces of equipment, or parts that are covered by the contract. You cannot change the details on this tab after the contract is approved.

Purchase requisition

A record that specifies the part or tool that you need. The purchase requisition must be approved before a purchase order can be created and sent to vendors.

Request for quotation

A record that is used to manage requests for quotations. In the Request for Quotations application, you can specify the items, required delivery dates, and other conditions that you want the vendor to meet for the delivery of a part or service. After you receive quotations from vendors, you can add them to the Quotation Lines table on the **Quotations** tab.If you requested quotations from vendors, in the Request for Quotation application, you can compare the quotations in the Quotation Lines table before you assign line items to vendors and create purchase orders.

Making purchases

When you are ready to complete the purchases, you can create the following records:

Purchase order

A record that specifies the details of a part or tool that is purchased from a vendor. You create a purchase order in the Purchase Orders application. For example, when you buy an engine from a vendor, you create a purchase order for that part and specify the transaction details, such as service type and storeroom.

Loan order

A record that tracks a piece of equipment that is borrowed from a vendor, typically for no charge, for a specified duration of time. For example, if you have an engine on loan from a vendor at no charge, in the Purchase Orders application, you select Loan Part or Loan Tool as the service type and specify the engine details. When the term of the loan or lease ends, in the Receiving and Inspection application, you specify the send back details.

Lease order

A record that tracks a piece of equipment that is leased from a vendor, for a specified duration of time and cost, which is typically described in a contract. For example, if you lease an engine from a vendor at a specified cost, in the Purchase Orders application, you select Lease Part or Lease Tool as the service type and specify the engine details. When the term of the loan or lease ends, in the Receiving and Inspection application, you specify the send back details.

Repair order

A record that tracks the repair of a piece of equipment. The vendor invoices the repair order's cost as a service line. For example, when an engine needs repair, in the Purchase Orders application, you select Repair Part or Repair Tool as the service type.

Exchange order

A record that tracks the exchange of a piece of equipment with a vendor. When a nonconformity is detected in part or tool, you can create an exchange order to sent it back to the vendor and receive a replacement. For example, if you exchange an engine with a vendor, in the Purchase Orders application, you select Exchange Part or Exchange Tool as the service type and specify the engine details.

Creating purchase orders

You can create purchase orders and reuse the data and vendor information while applying consistent terms and contracts. You can combine multiple purchase requisitions for the same vendor on a single purchase order.

Procedure
1. In the Purchase Orders application, click **New Purchase Order**.
2. Specify a description of your purchase order and fill the required fields.
3. On the **PO Lines** tab, click **New Row** to add line items to the purchase order.
4. In the Delivery Details section, specify the shipping information.
   a. In the outbound shipment fields, specify the values that are used to manage the shipment of the part to the vendor.
   b. In the inbound shipment fields, specify the values that are used to manage the shipment of the part that is sent from the vendor.

   If you specify a value in one of the shipment method fields, a shipment request record or shipment record is automatically created. For example, if you specify REQUEST in the **Inbound Shipment Method** field, an inbound shipment request record is automatically created. When the purchase order is approved, shipping locations and vendor dates from the purchase order lines are copied to the shipment request record or the shipment record.
5. In the **Bill To** field, specify a value, and provide the billing information.
6. Click **Save Purchase Order**.

What to do next

To print a purchase order you must create a request page. Go to the Reports Administration application and click the **Generate Request Pages** button.

Related concepts:

"Purchase Orders application" on page 241
You use the Purchase Orders application to create and manage purchase orders for configuration-managed parts. A purchase order is an authorized order from a purchasing agent or department to an internal supplier or external vendor.

Creating loan orders and lease orders

You create a loan order when you want to track a piece of equipment that is borrowed from a vendor, typically for no charge, for a specified period of time.

You create a lease order when you want to track a piece of equipment that is leased from a vendor for a specified period of time and cost, which is typically described in a contract.

Before you begin

If the part is included in a contract, in the Contracts application, open the contract line for the part and indicate whether shipment time is included in the loan or lease and how long the shipment times are.

About this task

You can create a loan or lease order in the Purchase Orders application, the Purchase Requisitions application, or the Request for Quotations application.

Procedure

1. In the Purchase Orders application, create a purchase order or open an existing purchase order.
2. On the **PO Lines** tab, add a new row.
3. In the **Line Type** field, select service.
4. In the **Service Type** field, select lease part, loan part, lease tool, or loan tool.
5. In the **Part Number** field, select a part number.
6. In the **Serial** field, enter the serial number of the part that is loaned or leased by the vendor.
7. Specify the dates for the loan or lease.
8. Indicate whether shipment time is included in the length of the loan or lease.
9. Save the changes.

What to do next

When you receive a part, you complete the receiving and inspecting process. When the term of the loan or lease ends, in the Receiving and Inspection application, enter the send back details.

Related concepts:

"Purchase Requisitions application" on page 241
You use the Purchase Requisitions application to create and manage purchase requisitions for configuration-managed parts, for supplies, or for services. You can also use this application to create purchase orders from purchase requisitions.

"Purchase Orders application" on page 241
You use the Purchase Orders application to create and manage purchase orders for configuration-managed parts. A purchase order is an authorized order from a purchasing agent or department to an internal supplier or external vendor.

"Request for Quotations application" on page 245
You use the Request for Quotations application to create and manage request for quotations (RFQ) for configuration-managed parts. Based on the quotations, you can assess the vendor who best meets your needs.

Creating repair orders

You create a repair order when you want to track the repair of a piece of equipment.

About this task

You can create a repair order in the Purchase Orders application, the Purchase Requisitions application, or the Request for Quotations application. In the Purchase Contracts application, you can also create a contract for the repair of parts.

Procedure

1. In the Purchase Orders application, create a new purchase order or open an existing one.
2. On the **PO Lines** tab, add a new row.
3. In the **Line Type** field, select **Service**.
4. In the **Service Type** field, select **Repair Part** or **Repair Tool**.
5. In the **Part Number** field, select a part number.
6. In the **Storeroom** field, select the storeroom that the repair part is returned to.
7. In the **Serial** field, enter the serial number of the part that is repaired.
8. In the Delivery Details section, specify the shipping information.
   a. In the outbound shipment fields, specify the values that are used to manage the shipment of the part to the vendor.
   b. In the inbound shipment fields, specify the values that are used to manage the shipment of the part that is sent from the vendor.
9. Save the changes.

Managing the shipment of parts

When you create purchase orders and exchange orders, you create shipment requests for the shipment of parts. In the Shipment application, you review shipment requests and can combine shipment lines from different shipment requests to create shipments. Users can track the progress of the shipment requests and shipments on the associated purchase orders and exchange orders.

Related concepts:

"Shipment requests for exchange orders" on page 178
A shipment request is a formal request to either ship a replacement part to a customer as an outbound shipment request, or to receive a counterpart from a customer as an inbound shipment request. In the Exchange Orders application, you can create shipment requests for exchange orders and monitor the progress of the shipment request and shipment on the **Shipments** tab.

"Shipments application" on page 242
You use the Shipments application to manage and track the transportation of parts to and from your location to ensure that the target delivery times that are on service level agreements are met. Shipment records contain information, such as the weight and value of shipments, transportation methods used, and key shipment dates.

Related tasks:

"Exchange orders" on page 177
Exchange orders manage requests from customers as part of a customer pool management agreement. You can track the request, and receive and fulfill orders for parts that you supply from a pool. For example, you might receive a request to supply a replacement for an airplane cabin sensor that malfunctioned.

Creating shipments

You create shipment records to track the logistics of shipments to and from your location. You can combine multiple shipment requests for the same location into a single shipment.

Procedure

1. In the Shipments application, create a new shipment record.
2. On the **Shipment Lines** tab, create a new row in the shipment lines section, or click one of the following buttons:

Option	Description
Ship From Requests	All shipment requests that have the same origin are shown.
Ship To Requests	All shipment requests that have the same destination are shown.
Ship From & Ship To Requests	All shipment requests that have the same origin and destination are shown.

3. Select the shipment requests that you want to add to the shipment, and click **OK**.
4. Specify the type of the shipment line and the number of parts for the shipment line.
5. Optional: Specify additional information about the shipment line.
6. Optional: Add more shipment lines to the shipment.
7. Optional: On the **Shipments** tab, specify additional information about the shipment. For example, specify the gross weight, value, and HS code for the shipment.
8. Save the shipment record.

Shipment requests for purchase orders

A shipment request is a formal request to either ship a part to a vendor as an outbound shipment request, or to receive a part from a vendor as an inbound shipment request. In the Purchase Orders application, you can choose to automatically create shipment requests and shipments when a purchase order is approved. On the **Shipments** tab, you monitor the progress of shipment requests and shipments.

If you want a shipment request and shipment to be automatically created for a purchase order, specify details for the shipment request in either the outbound shipment fields to create an outbound shipment request and shipment, or in the inbound shipment fields to create an inbound shipment request and shipment. After the purchase order is approved, the shipment request and a shipment for the request appear on the **Shipments** tab.

In the **Shipments** tab, you can view a complete history of every shipment request or shipment that is associated with the purchase order. You cannot modify shipment request lines or shipment lines in the Purchase Orders application.

Receiving and inspecting parts

When ordered parts are delivered, the receiving process tracks their receipt into inventory and initiates inspections if required. Rotable parts that are uninstalled from an aircraft or piece of equipment and then repaired are also received and inspected. If a nonconformity is detected during inspection, the details are recorded, and the affected part is held in quarantine until it is assigned for use, returned to the vendor, or scrapped.

Related concepts:

"Receiving and Inspection application" on page 243
When parts are delivered or when rotable parts are repaired, you use the Receiving and Inspection application to track the receipt of the parts into your inventory and initiate necessary inspections. If a nonconformity is detected during inspection, you record the details and assign the part to a quarantine location for further review.

Receiving parts

When parts are delivered to your organization, you review the quantity and inspection requirements for each part.

Procedure

1. In the Receiving and Inspection application, click the **Select Parts for Receipt** button.
2. Optional: To filter the list of ordered parts to a specific storeroom, specify a value in the **Storeroom** field.
3. Optional: In the Select Parts for Receipt table, reject individual lines, or click **Reject All** to mark all selected lines as rejected.
4. Select a part that you want to accept.
5. In the S/N for PO Line table, specify the serial number. If the serial number exists in the database, the value is automatically updated in the **Aircraft or Equipment Number** field.
6. If the serial number does not exist in the database, enter a value in the **Aircraft or Equipment Number** field or click **Autonumber**.
7. If a selected part is a consumable part that is managed by lot, in the Batches for PO Line table, add batch numbers and quantities. The combined quantity must equal the value in the **Quantity** field of the corresponding order line.
8. Click **OK** to start the receipt process.
9. In the Receipt and Inspection Line table, review each row and remove any row that you do not want to receive.
10. Click **Save**.

What to do next

If the part requires inspection, begin the inspection process.

Inspecting parts

Some parts require inspection before they can be entered into inventory. After receipt, these parts are stored in an inspection location until an inspection is performed.

About this task

You can inspect parts that are included in external purchase orders, repair orders, lease orders, and loan orders. When you inspect parts, you must update the inspection status to specify if the parts should be added to your inventory or held in quarantine for further review.

Procedure

1. In the Receiving and Inspection application, select the record that contains the parts that require inspection.
2. Select the **Change Inspection Status** action.
3. In the Change Inspection Status window, select a receipt and inspection line or order line with the parts that you want to inspect.
4. Specify values in the required fields.
5. Optional: In the Inspection Items table, you can click **Accept All** or **Quarantine All** to accept or quarantine all parts for this receipt and inspection line or order line.
6. For rotable parts, add the required information to the Aging Data table.
7. Optional: Select the **Received** check box for each airworthiness approval tag or certificate that was received.
8. If a nonconformity is detected, enter the nonconformity codes.
9. Click **OK** to complete the inspection process.

Reviewing parts in quarantine

If a noncomformity is detected in a part during inspection, the noncomforming part is held in a quarantine location until it is assigned for use, returned to the vendor, or scrapped.

About this task

When a part is held in quarantine, you must update the quarantine status to specify whether the part should be added to your inventory, returned to the vendor, or scrapped.

Procedure

1. In the Receiving and Inspection application, specify the purchase order for the part that is held in quarantine.
2. In the Receiving and Inspection application, select a receipt and inspection record or purchase or repair order for the parts that are held in quarantine.
3. Select the **Change Quarantine Status** action.
4. In the Change Quarantine Status window, select a receipt and inspection line or order line with the parts that you want to review.
5. Select whether to accept, return, or scrap the part and save the record.

Configuring and managing vendors

You manage vendors to ensure that they have the certifications and qualifications that are necessary to supply goods and services for your aircraft and equipment.

Related concepts:

"Locations application" on page 228
You can track the current and past locations of aircraft and equipment including

their performance at various locations.

Creating company records for vendors

A company record contains organization-specific information about vendors, such as contact names and addresses.

About this task

If a company has multiple locations, you can create separate records for each branch location and associate the records with a parent company record. Company information must be entered in the Companies application first so that other applications, such as Inventory and Purchasing, can access the information.

Procedure

1. On the toolbar of the Companies application, click **New Company**. If the **Company** field is empty, specify a value.
2. If the company has a parent, specify a value in the **Parent** field or click **Detail Menu** to select an option and retrieve a value. Adding a name to the **Parent** field associates the company with the parent.
3. In the **Description** field, type a description of your company.
4. In the **Company Type** field, specify the type of company.
5. Specify the currency that the company uses.
6. Optional: Specify details about the purchasing and payment.
7. Click **Save Company**.

Related concepts:

"Companies application" on page 245
The Companies application maintains detailed information about vendors, manufacturers, and other companies.

Creating company master records for vendors

Company master records maintain detailed information about companies that belong to a particular company set. Company master records contain information such as contact information for the company, the purchasing details, and payment details.

Procedure

1. From the toolbar of the Company Master application, click **New Company Master**. If the **Company** field is empty, specify a value.
2. Specify a description of the company.
3. Specify the type of company.
4. Specify the currency that the company uses.
5. Optional: In the **Customer #** field, specify a number to be used by outside companies to uniquely identify your company.
6. In the **Company Type** field, specify a value or click **Select Value**.
7. Specify the contact information, such as phone, fax, and e-mail.
8. Specify the contact address information and remit-to-company address information.
9. Click **Save Company Master**.

What to do next

After you have created a company master record, you need to add the record to one or more organizations.

Related concepts:

"Company Master application" on page 246
You use the Company Master application to create company master records that belong to a particular company set. You can also use the Company Master application to associate a company master record with an organization.

Creating purchase contracts for vendors

In the Purchase Contracts application, you can maintain purchase contracts with outside vendors. You can create purchase contracts, blanket contracts, and price contracts.

Procedure

1. In the Purchase Contracts application, click **New Purchase Contract**. The status of the new contract is set to draft and the start date is set to the current date.
2. Specify one of the following types of contracts:

Option	Description
Blanket contract	To create an agreement to spend a predetermined amount with the vendor over a period of time.
Price contract	To create a contract that specifies that parts or services purchased from the vendor over a period of time are provided at an agreed-upon price.
Purchase contract	To create an agreement to purchase parts or services at an agreed-upon price with a vendor. To create this type of contract, you must have a purchase order without a specified maximum amount.

3. Specify the currency value.
4. Optional: If you are creating a blanket contract, specify the following values:

Option	Description
Maximum Release Amount	• To set a spending limit on a blanket contract, specify a maximum amount when you create the blanket contract. • To set a spending limit for each release purchase order against the blanket contract, specify a maximum release amount.

When the create release property is selected, you can specify or change information in the **Maximum Release Amount** field.

5. Optional: For price contracts or purchase contracts, specify the maximum amount that a purchase order can have on the contract.
6. Optional: Provide additional detail and vendor information.

Related concepts:

"Purchase Contracts application" on page 230
You use the Purchase Contracts application to maintain purchase contracts with outside vendors. On the contract, you can specify the items or services that are provided and their costs, shipping and handling, expected delivery times, financial terms, and vendor information.

Defining terms to apply to purchase orders

You use the Terms and Conditions application to define terms that apply to purchase orders.

Procedure

1. In the Organization table window, select the organization for which you want to define a term.
2. Click **New Row**.
3. Specify a value in the **Term** field. The value must be unique.
4. Type a description
5. Optional: Specify a value in the **Type** field. The value you define can be used to filter the Terms and Conditions library. For example, you might have defined a type as PURCHASE, in which all the corresponding records contain information applicable to purchase orders. You could then search on PURCHASE and find only the relevant terms.
6. To be able to edit the term when it is associated with records in other applications, select the **Editable** check box. Otherwise, clear the check box.
7. To have the term appear as a default on all future purchase orders, select the **Default on PO** check box. Otherwise, clear the check box.
8. Click **Save Terms and Conditions**.

Related concepts:

"Terms and Conditions application" on page 246
You use the Terms and Conditions application to specify and to maintain a library of terms and conditions. You can add the terms and conditions to a purchasing document or to a contract. Terms can contain information such as liability concerns, shipping and handling details, and delivery time expectations.

Recording vendor invoices

When you create an invoice, you match the invoice information with the purchase orders and the receipt of materials and services. You can also invoice parts for which there are no purchase orders. You can also create invoices for consignment parts that are held in inventory, and that do not require payment upon receipt.

Before you begin

You can create an invoice with purchase orders whose sites are different from the site where the invoice is generated. However, the invoice must be associated with the same organization as the purchase order sites. You must have security privileges to the same organization to which the purchase order sites belong. The purchase order must be in Approved, In Progress, or in Closed status.

Before you can create a consignment invoice and add line items to the invoice, the parts must first be created as consignment parts.

About this task

You can create vendor invoices as you receive them, record debit and credit notes from vendors, and create consignment invoices. Consignment invoices are different from other types of invoices. Consignment invoices are generated only when the consignment parts in inventory are used, rather than when the parts are received.

Procedure

1. From the toolbar of the Invoices application, click **New Invoice**.
2. In the **Type** field, select the type of invoice you are creating.
3. Specify information in the fields of the **Invoice** tab.
4. If the invoice is associated with a purchase order, in the **PO** field, type the purchase order number. Lines specific only to that purchase order can be copied to the invoice.
5. If the invoice is not associated with a purchase order, leave the **PO** field blank, and specify the vendor in the **Company** field. This step also applies if you want to create an invoice with purchase orders whose sites are different from the site where the invoice is generated.
6. In the **G/L Posting Date** field, specify a date for the general ledger financial period. If your system administrator specified that the invoice date is used, the **G/L Posting Date** field is populated with the date from the **Invoice Date** field. If the value specified is not valid, the value is updated to the start date of the next open financial period. You can specify a different value.
7. On the **Invoice Lines** tab, click **New Row**, and add line items as needed. To add multiple PO lines, click the **Copy PO Lines** button. You can add loan order, lease order, material lines or service lines.
8. If you are creating an invoice for consignment parts, click **Select Consignment Transactions**.
9. In the Select Consignment Transactions window, select the transactions that you want to invoice for the vendor that is replenishing the consignment parts, and click **OK**.
10. Save the invoice.

What to do next

After you create an invoice and add line items, the invoice can then be approved and routed to Accounts Payable.

Related information:

Invoices application
You use the Invoices application to record vendor invoices as you receive them. You can also record debit and credit notes from vendors, and match invoice details against purchase orders and receipts. You can reverse approved or paid invoices, credit memos, or debit memos. Items that are part of the consignment inventory can be invoiced when the items are used.

Managing certifications, qualifications, and capabilities

Certification management ensures that vendors are qualified to supply the goods and services that you require. Qualification management ensures that labor resources have the appropriate skills to perform their work. Capability management ensures that repair locations have the requisite capabilities to perform maintenance work for you.

Vendor certification and approval

Vendor certifications indicate that a vendor has particular skills. You track vendor certifications to ensure that business operations are compliant with regulatory requirements. You update the vendor certifications regularly to ensure that they are renewed when needed.

The vendor that you select for a procurement order must pass an approval process that uses approval rules. The approval process specifies the order type that the vendor can process and the group of products that the vendor can deliver.

Approval rules

Approval rules help you to set the standards that vendors must meet and help you to order the correct part, or the correct service, from the correct vendor. The approval rules apply to transaction types such as parts, tools, and services. You manage transaction types and groups of products by using and updating the approval rules.

If you use an authorization process for the vendor, in the Company application, in the Company tab, you select the **Approval** check box. The approval rules are based on the transaction type, the service type, rotable status, and the condition of the part. You enter the statuses that are required to approve a transaction type. For example, a rule might state if a part is rotable and new, the part is approved. If the vendor sends a used, rotable part, then the transaction is not approved.

Creating approval rules

The authorization process involves checking the approval rules to determine whether the vendor is able to supply the correct part or service. In the Company application, you use the approval rules to manage the status of different transaction types, such as a transaction for a repair or for a standard service.

Before you begin

In the Company application, in the Company tab, you can select the **Approval** check box to indicate that an authorization process is used for the vendor.

Procedure

1. In the **Approval** tab, add a new row.
2. Enter the transaction type.
3. Enter the service type.
4. Specify whether the transaction is for a rotable part or tool.
5. Specify the condition of the transaction type, such as new, used, or both.
6. Save your entry.

Configuring qualifications for labor

You use the Qualifications application to create, modify, and track qualifications and requirements for qualifications. You can also associate a labor record with one or more qualifications. In the Labor application, you can view qualifications that are associated with a particular labor record. A qualification indicates that a labor resource is proficient in a particular skill. A requirement is a task, such as taking an exam, that must be finished before a qualification is awarded. A requirement can be used to track the progress toward the completion of a qualification, and to ensure that labor has the skill sets that are required for a work order or job plan.

In the Qualifications application, you can use the **Add/Modify Qualification Requirements** action to add requirements. After a requirement is created, you can associate the requirement with a qualification by using the **Requirements** tab.

Qualifications types

Each aircraft requires laborers to have specific qualifications. Different types of qualifications authorize laborers to perform their assigned tasks. The renewal dates for each qualification type must be tracked to keep all qualification types updated.

The following qualification types help track the required level of laborer skills for each aircraft:

Table 22. Qualification types

Type of qualification	Description	Awarded to	Awarded by	Criteria for renewal	Example
License	Authorization for a specialized laborer to perform assigned tasks.	Maintenance laborers.	An authority.	Laborer experience: number of hours and tasks that are spent in specialized labor or number of aircraft worked on per year.	B1: mechanic, B2: electric, C: certifying staff.
Qualification	Authorization for a specialized laborer to perform assigned tasks for a specific aircraft.	Maintenance laborers.	Manufacturer or authorized training center.	Laborer experience: Number of hours and tasks spent working on a specific aircraft. Training criteria: A set of training courses that the laborer has both attended and passed.	B1-A320, B1-A340, B2-A340, B2-A380.
Certificate	Certification for a globally recognized skill set.	All types of laborers.	Internal or external training center.	Training criteria: A set of training courses that the laborer has both attended and passed.	Safety certificate.

Creating qualifications

You can create qualification records in the Qualifications application to track what qualifications and requirements for a qualification must be earned or renewed by labor.

Procedure

1. In the Qualifications application, click **New Qualification**.
2. Optional: If the **Qualification** field is blank, enter a qualification identifier.
3. Optional: Enter a description of the qualification.
4. Specify the type of qualification.
5. Optional: Provide additional information for the certificate:
   a. If a certificate is required for the qualification, select the **Certificate Required** check box.
   b. Specify values such as duration period and required use period.
6. Optional: In the Required Craft and Skill Levels section, add a new row to specify prerequisite crafts for the qualification.
7. Optional: In the Tools That Require This Qualification section, add a new row to specify tools that require operators to have this qualification.
8. Save the qualification record.

What to do next

Some qualifications must be renewed periodically. You use the **Extend/Renew Qualification** function to renew an existing qualification for a qualification record. On the **Requirements** tab, you can associate requirements with a qualification. On the **Associated Labor** tab, you can associate qualifications with labor records.

Associating labor with qualifications

You associate a labor record with qualifications to indicate that the labor is qualified to complete a specific type of work order.

Before you begin

To associate labor with qualifications, both the labor record and the qualification record must be active. The labor also must have the prerequisite crafts and skill levels for the qualification that is listed on their labor record.

Procedure

1. In the Qualifications application, select the qualification record that you want to associate with a labor record.
2. Click the **Associated Labor** tab.
3. Specify a value for labor.
4. Specify the first year that the laborer acquired competence in the qualification.
5. Optional: Specify additional information about the certification.
   a. Specify a certificate number. This information is read-only when the record is saved.
   b. Specify the date that the qualification became effective.
   c. Specify the date that the certificate was validated.
   d. Specify additional information, such as the person who validated the certificate requirements and the organization that issues the certificate.
6. Save your changes.

What to do next

Select a labor record on the Labor table to view the requirements that are completed by or pending for a labor. You can also view, modify, and track

requirements and qualifications from the **Qualifications** tab in the Labor application.

Configuring capabilities for MRO locations and vendors

Capability records contain specialist information about a vendor, manufacturer, or location. A capability is often, but not necessarily, indicated by a license or certificate, signifying proficiency in a particular skill or skills. Some certificates have expiration dates and individuals who hold the certificates must renew them periodically.

Capabilities and purchasing records

Capabilities refer to the approvals, certificates, and other formal records that define the ability of the organization to provide goods and services. Certain industries maintain aircraft or equipment that are subject to regulatory control, and require traceability for parts and services relating to maintaining these aircraft or equipment.

You define capability records in the Capabilities application. A capability is often, but not necessarily, a license or certificate that signifies proficiency in a particular skill or skills. A governing board can award a certificate. Some certificates have expiration dates and individuals who hold the certificates must renew them periodically.

After capability records are created, you can add capabilities to the following types of purchasing records:

- Purchase orders
- Purchase requisitions
- Requests for quotations

To add a capability to a purchasing record, you must first select the **CM Capability** check box on the **Lines** tab. Then you can use the **Select Capability** button on the **Terms and Conditions** tab to select the specific capability.

Creating capabilities

To track qualifications and ensure that vital maintenance and vending are supplied by qualified individuals, you can create capabilities and certification requirements for capabilities.

Procedure

1. On the toolbar, click the **New Capability** icon and specify a unique identifier in the **Capability** field. This identifier must be unique within an organization.
2. Specify a description and the type of capability.
3. If a certificate is required for the capability, select the **Certificate Required** check box.
4. Optional: You can specify the duration period and the required use period for the certificate.
5. Optional: You can specify class and category, which are prerequisites for the capability in the Class/Category table.
6. Save the capability.

Associating maintenance locations with capability records:

Some highly regulated industries have requirements that maintenance can only be performed by individuals with specific certifications or qualifications. To track certifications and ensure maintenance is done by qualified individuals, you can associate a maintenance location record with a capability.

About this task

After the status of a capability is changed to INACTIVE, that capability can no longer be added to the list of capabilities on a maintenance location record. However, maintenance location records that have already been associated with that capability are unaffected by this change in capability status.

For some capabilities, specific class and category are required. Only those maintenance location records that possess the required crafts and skill levels can be associated with such capabilities. If no specific craft and skill levels are required, the capability can be associated with any maintenance location record.

Procedure
1. In the Capability application, select the capability record and click the **Associated Maintenance Locations** tab.
2. In the Maintenance Locations table, add a new row and specify the maintenance location.
3. Specify the first year that the company acquired competence in that capability.
4. Optional: Specify the following information about a certification:
    a. Specify a certificate number.
    b. Specify the effective date of the certificate.
    c. Specify a validation date for the certificate.
    d. Optional: Specify the individual who validated the certificate requirements and the organization that issued the certificate.
5. Save the capability.

Extending or renewing capabilities:

If a location renews its certification, you can extend or renew the existing capability associated with a maintenance location record.

Procedure
1. In the Capability application, select the record and click the **Associated Maintenance Locations** tab.
2. In the **Maintenance Locations** table window, view the details for the maintenance location code for the capability that you want to extend or renew.
3. Click **Extend/Renew Capability**.
4. Specify the dates when the certificate was validated.
5. Specify the date when the extension or renewal becomes effective.
6. Click **OK**.

Adding capabilities to purchase transactions:

Capabilities refer to the approvals, certificates, and other formal records that a company holds. These records define the ability of the organization to provide

goods and services as detailed in the capability records. Certain industries maintain aircraft or equipment that are subject to regulatory control, and require traceability for parts and services relating to maintaining these aircraft or equipment.

Procedure

1. In the Purchase Requisitions, Purchase Orders, or Request for Quotations application, select a record and open the **PR Lines**, **PO Lines**, or **RFQ Lines** tab.
2. Select a CM part.
3. In the **Capability** field, specify one of the following options:
   - If no capability is defined for terms and conditions, leave this field blank.
   - If capability is defined for terms and conditions but is not valid, specify N. For example, specify N if the specified vendor does not hold the capability or the capability is expired.
   - If capability is defined for terms and conditions and is valid, specify Y. For example, specify Y if the specified vendorholds the capability and the capability is not expired.
4. On the **PR**, **PO**, or **RFQ** tab, if the vendor holds valid capability, select the **CM Capability** check box in the Vendor table.
5. On the **Terms and Conditions** tab, specify a sequence, capability, and line item.
6. Save the purchase record.

Chapter 13. Managing warranties

You can manage warranties for aircraft or equipment and parts, and you can manage warranty claims.

Aircraft or Equipment Warranty Contracts application

To create and view aircraft or equipment warranty contracts, you use the Aircraft or Equipment Warranty Contracts application. An aircraft or equipment warranty contract defines the repairs to an aircraft or piece of equipment that the warranty provider is responsible for performing or paying for. The warranty contract defines warranty durations for aircraft or equipment by time or meter.

Coverage

To specify the warranty coverage, including time duration and meter-based duration, you use the **Coverage** tab.

You use the Coverage table window to define a new coverage line for warranty contracts. The coverage can be for a service or a standard service. There are two types of coverage lines:

Full coverage
> The entire aircraft or piece of equipment is under warranty.

Component coverage
> A specific component or components and optionally, their child components, are under warranty.

You also define time durations for the warranty in the Coverage table window.

You use the Meter Lines for Coverage Line table window to define the meter-based duration for the contract line that is selected in the Coverage table window.

Associated Aircraft or Equipment

To associate aircraft or equipment with the contract, you use the **Associated Aircraft or Equipment** tab. Each aircraft or piece of equipment that you add inherits all coverage that is defined on the warranty contract. For each line of coverage for an aircraft or piece of equipment, you can specify the start date and the start meter life-to-date reading. After you specify starting points, the end points of the coverage durations, including goodwill, are calculated.

For each aircraft or piece of equipment, meter duration records are created for defined meter durations of each coverage line if the following condition is met: The unit of measure of the aircraft or piece of equipment meter matches the unit of measure defined on meter durations on the warranty coverage lines.

For example, you specify a coverage line with a duration of 100,000 and a unit of measure of miles. You associate an aircraft or piece of equipment with the contract. The aircraft or piece of equipment has an odometer with a unit of measure of miles. A meter duration for the odometer on the aircraft or piece of equipment is created for this aircraft or piece of equipment and coverage line.

Terms and Conditions

To associate terms and conditions with the contract or to view applied terms and conditions, you use the **Terms and Conditions** tab. Terms and conditions can specify such information as:

- Liability concerns
- Shipping and handling details
- Delivery time expectations

Creating aircraft or equipment warranty contracts

You create aircraft or equipment warranty contracts to define the repairs to aircraft or equipment that the warranty provider is responsible for performing or paying for. Create aircraft or equipment warranty contracts in the Aircraft or Equipment Warranty Contracts application.

About this task

When you create an aircraft or equipment warranty contract, it has a unique contract number. You can append data to the number to differentiate it from other contracts. For example, if you have multiple sites and want to track contracts by site, you can append a site identifier to the contract number.

An aircraft or equipment warranty contract tracks manufacturer warranty information for multiple aircraft or equipment by time or meters. There might or might not be costs that are associated with the warranty.

Procedure

1. In the Aircraft or Equipment Warranty Contracts application, click **New Warranty Contract**.
2. Enter information about the provider of the warranty in the Vendor section on the **Contract** tab. If the warranty is one that you provide a warranty to your customers for this aircraft or piece of equipment, select the **Warranty for Customers** check box.
3. Specify any relevant details about the aircraft or equipment warranty contract properties the **Properties** tab.
4. Specify coverage details of the warranty coverage on the **Coverage** tab. You can add coverage lines only if the contract status is Draft, Pending Revision, or Waiting for Approval.
   a. Click **New Row** for a new coverage line and complete the line **Description** field.
   b. Select the **Full Coverage** check box, or specify the covered component.
   c. Define warranty duration information. For example, if you want to set the duration to one year, enter 1 in the **Duration** field and specify YEARS in the **Time Unit** field.
   d. Optional: Specify goodwill duration. *Goodwill* is an informal grace period that temporarily extends the warranty coverage.
   e. In the **Actuals Coverage Details** section, specify whether the coverage extends to labor, materials, and services by selecting the appropriate check boxes.
   f. If the coverage line is based on meter duration, such as miles or kilometers, specify the meter-duration coverage in the Meter Lines for Coverage Line table.

5. Optional: Specify any applicable terms and conditions on the **Terms and Conditions** tab.

6. From the Action menu, click **Authorize Sites** to authorize one or more sites to use the contract. You must authorize the warranty contract for at least one site before you can approve the contract.

7. Save the contract and then approve it. You must approve the contract before you can specify the aircraft or equipment that are covered.

8. On the **Associated Aircraft or Equipment** tab, specify the aircraft or equipment that are covered by the warranty contract.

9. Save the aircraft or equipment warranty contract.

Extending warranty coverage

You can manually extend the warranty coverage for an aircraft or piece of equipment based on certain situations, such as aircraft or equipment condition changes.

Procedure

1. In the Aircraft application or the Equipment application, open the record that you want to extend warranty coverage for.

2. On the **Warranties** tab, extend the warranty.

Option	Description
For time-based coverage	Use the Coverage for Contract table
For meter-based coverage	Use the Meters for Coverage Line table

3. Enter a value in the **Coverage Extension** field.

4. Enter the reason for the extension.

5. Save the record.

Warranties for customers

You might provide customers with warranties that are covered by your company, rather than through a manufacturer or vendor. A warranty for customers is provided directly by your company to your customers.

You can track these warranties for customers in the Aircraft or Equipment Warranty Contracts application. You can specify warranty duration and coverage details. A full audit trail of all warranty transactions is maintained. You can designate a contract as a warranty that is provided directly to customers by selecting the **Warranty for Customers** check box.

Part Warranty Contracts application

To create and view part warranty contracts, you use the Part Warranty Contracts application. An part warranty contract defines the warranty coverage for specific parts or for a group of parts.

A warranty contract can cover a part or a group of similar parts that have the same component code. The warranty specifies a length of time or a meter duration for which coverage applies. For each part warranty contract, you identify the vendor and define the coverage and, where applicable, the meter duration for the coverage.

You use the **Coverage** tab to specify the warranty coverage, including time and meter durations. Use the Coverage table window to define part coverages that have time durations. Use the Meter Lines for Coverage table window to define the meter-related duration for the coverage line that is selected in the Coverage table window.

After part warranty contracts are created and approved, warranties can be identified when they apply to the following parts:

- Parts on invoices
- Inventory issues and transfers
- Purchase orders
- Purchase requisitions
- Requests for quotations
- Work orders

Depending on your system configuration, when a potential warranty situation exists, you receive a warranty notification message.

Creating part warranty contracts

You create part warranty contracts to specify the warranty coverage for parts or groups of parts. Create part warranty contracts in the Part Warranty Contracts application.

About this task

When you create a part warranty contract, it has a unique contract number. You can append data to the number to differentiate it from other contracts. For example, if you have multiple sites and want to track contracts by site, you can append a site identifier to the contract number.

Procedure

1. In the Part Warranty Contracts application, click **New Warranty Contract**.
2. Enter information about the provider of the warranty in the Vendor section on the **Contract** tab.
3. Specify any relevant details about the part warranty contract properties the **Properties** tab.
4. On the **Coverage** tab, specify the part or parts that the warranty covers. Click **New Row** then specify a value in one of the following fields:

Field	Coverage
Part	The coverage line applies only to parts with this part identifier.
Component	The coverage line covers all parts that are associated with this component code in the Part Master application.

5. Define warranty duration information. For example, if you want to set the duration to one year, enter 1 in the **Duration** field and specify YEARS in the **Time Unit** field.
6. Optional: Specify goodwill duration. *Goodwill* is an informal grace period that temporarily extends the warranty coverage.
7. If the coverage line is based on meter duration, such as miles or kilometers, specify the meter-duration coverage in the Meter Lines for Coverage table.

8. Optional: Specify any applicable terms and conditions on the **Terms and Conditions** tab. Terms and conditions can contain information such as liability concerns, shipping and handling details, and delivery-time expectations.
9. From the Action menu, select **Authorize Sites** to authorize one or more sites to use the part warranty contract. You must authorize the warranty contract for at least one site before you can approve the contract.
10. Save the part warranty contract, and then approve it.

Warranty Claims application

To generate warranty claims based on warrantable transactions, such as labor use and material use, you use the Warranty Claims application. You can also enter ad hoc warranty claims.

Use the **Claim** tab to view warranty, vendor, and other information about a warranty claim and to create new claims. You can view the current meter readings for the listed aircraft or equipment in the Current Meter Readings table.

Use the **Claim Lines** tab to view the detailed claim information for generated claims. Claims have claim lines only if they have been generated by using the **Generate Warranty Claims** action. The value in the Claimed Amount column can be edited until the claim is approved.

Warranty claim processes

If aircraft, equipment, or parts get damaged, you can seek to repair or replace them. You can make warranty claims that are based on warrantable transactions or based on ad hoc requirements.

Generated warranty claims

You can generate warranty claims based on warrantable transactions. A warrantable transaction is a transaction that meets defined warranty criteria and that might be included on a warranty claim, for example, labor use or material use on a work order to repair an aircraft or piece of equipment that is under warranty. You can claim a warrantable transaction only once. Depending on your organization's requirements, you are alerted when warranty claims might exist in following situations:

* When you change work orders
* When you change purchase requisitions
* When you change purchase orders
* When you change requests for quotations
* When you change labor transactions
* When you change inventory issues

Warranty claims for aircraft or equipment that are under warranty are generated based on incident. For example, if your car breaks down twice, the first time because the steering pump failed and the second time because the alternator failed, these failures are recorded as separate incidents. Therefore, these incidents are two separate claims. A work order is created for each repair job and you are alerted that possible warranty situations exist. When you generate a warranty claim, a warranty claim is automatically created for each incident.

After you generate a warranty claim, it might have several claim lines. For example, two people are required to repair the alternator and each work one hour. The repair job also requires three parts. After you generate the warranty claim for the alternator repair job, five claim lines are automatically created for the hour worked by both people and each part.

To generate warranty claims for aircraft, equipment, or parts that are based on warrantable transactions, go to the Warranty Claims application, select the **Generate Warranty Claims** action, and specify the warranty claim details. The initial status of the warranty claim is determined by your organization's requirements.

Ad hoc warranty claims

You can create ad hoc warranty claims to save processing time and associated costs for low-cost parts. For example, you have warranty coverage for air brake valves from your vendor. The air brake valve is a low-cost part. Rather than submit a warranty claim each time an air brake valve fails, you can wait until you accumulate several failed parts. You can then create an ad hoc warranty claim for the entire batch of failed air brake valves.

If you have a number of parts that must be replaced or repaired, you can seek reimbursement from the vendor, even if they are not covered under warranty. For example, if you have several air brake valves that failed, you can create an ad hoc warranty claim to return the parts to the vendor. Typically, a vendor might offer some reimbursement for a large volume of failed parts.

You can also create ad hoc warranty claims for incidents that are not recorded in work order inventory transactions.

To create an ad hoc warranty claim, go to the Warranty Claims application, click **New Claim**, and specify the warranty claim details.

Warranty claim completion

If you submitted a warranty claim to replace a part, from the **Select Action** menu, create a no-charge purchase order. When the no-charge part on the purchase order is received, the quantity recovered on the warranty claim is set to the total quantity of the receipts. If the quantity recovered is equal to or greater than the claimed quantity, the status of the warranty claim is set to closed. A return transaction is created that credits the aircraft or piece of equipment on the claim for the inventory value of the part, and the part is returned to the storeroom that is specified on the warranty claim.

If you submitted a warranty claim for refund of parts or for repair costs for an aircraft or piece of equipment, from the **Select Action** menu, create a credit invoice. After you create the credit invoice, the status of the warranty claim is set to claim submitted. When the credit invoice is approved in the Invoices application, the recovered amount on the claim record is set to the total amount on the credit invoice. If the amount recovered is equal to or greater than the claimed amount, the status of the warranty claim is set to closed.

Warranty claim statuses

Warranty claims can be generated with a status of waiting for approval (WAPPR) or approved (APPR). Warranty claims can also have a status of claim submitted (CLAIM), canceled (CAN), or closed (CLOSE).

The initial status of generated claims is controlled by a setting in the Organizations application. You can only edit warranty claim information while the claim is in waiting for approval (WAPPR) status.

You typically must approve a claim before you submit it to the vendor. Use the Change Status window to approve or cancel a warranty claim and to close a completed claim.

When a credit invoice or a no-charge purchase order is generated from a warranty claim, the status of the claim is set to CLAIM. When the invoice is approved in the Invoices application, or the no-charge item on the PO is received, the claim status is set to CLOSE.

Managing warranty claims

A warranty claim is a document that identifies a repair incident that is covered under warranty. You use the warranty claim to seek reimbursement for the costs or parts that were used to correct the problem.

Creating ad hoc warranty claims

An *ad hoc warranty claim* is a claim against a warranty for recovery of cost or parts in which no specific claim line items are identified.

About this task

You can create two types of warranty claims:

- A claim that is based on warrantable transactions, such as labor use, material use, or service use. You can only create claims against warrantable transactions by using the **Generate Warranty Claims** action. The transactions are listed as warranty claim lines.

- An ad hoc warranty claim for incidents that are not recorded and for which no transaction details exist. No individual claim line items can be specified on an ad hoc warranty claim.

Procedure

1. On the toolbar in the Warranty Claims application, click the **New Warranty Claim** icon.
2. Specify a value in the **Claim** field.
3. Specify a date in the **Incident Date** field. The field defaults to the current date.
4. In the **Contract** field, specify the warranty contract that you are making a claim against.
5. Enter a value in the **Aircraft or Equipment** field.
6. If a work order is associated with the claim, specify the work order number.

   If the work order records actual labor use or actual material, use **Generate Warranty Claims** rather than creating an ad hoc claim. Using the **Generate**

Warranty Claims action, you can select the labor and material use transactions for which you are seeking reimbursement.

7. Optional: Specify additional information, such as a component code or vendor contact, as necessary.
8. In the **Cost Amount** field, enter the cost for the warrantable incident.
9. In the **Claimed Amount** field, enter the amount that you are claiming. This amount can be the same as the cost amount. The claimed amount can also be higher than the cost amount, if you claim a markup for repair of an aircraft or piece of equipment under warranty or replacement of parts under warranty.
10. Save the ad hoc claim.

Creating credit invoices

You can create a credit invoice for reimbursement of costs that are incurred for repair of an aircraft or piece of equipment that is under warranty. You can also create a credit invoice for reimbursement for parts that are under warranty.

About this task

Creating a credit invoice is one of the two ways to complete the warranty claim process. You can also create a no-charge purchase order (PO).

Procedure

1. In the Warranty Claims application, open the warranty claim for which you want to create a credit invoice.
2. On the claim record, confirm that all of the following conditions are true:
   - The status of the claim is approved (APPR).
   - There is a vendor in the **Vendor** field.
   - There is an aircraft or piece of equipment identifier in the **Aircraft or Equipment** field.
   - There is a nonzero amount in the **Claimed Amount** field.
   - There is not already a number in the **Invoice** field or the **PO** field.
   - There is either a fully specified GL account in the **GL Account** field, or else the field is empty (null). If there is a partially specified GL account in the field, you cannot create an invoice.
3. From the Action menu, select **Create Credit Invoice**.

Results

If any of the specified conditions are not met, you are notified that an invoice cannot be created.

If all the conditions are met, a message notifies you that the invoice has been generated, and provides the invoice number.

After the claim generates the credit invoice, the status of the claim is set to CLAIM (claim submitted). When the invoice status is changed to APPR (approved) in the Invoices application, the recovered amount on the claim record is set to the total amount on the credit invoice. If the amount recovered is equal to or greater than the claimed amount, the claim status is set to CLOSE (closed).

Creating no-charge purchase orders

You can create a no-charge purchase order (PO) for replacing parts under warranty for a warranty claim.

About this task

Creating a no-charge PO is one of the two ways to complete the warranty claim process. You can also create a credit invoice.

Procedure

1. In the Warranty Claims application, open the warranty claim for which you want to create a no-charge PO.
2. On the claim record, confirm that all of the following conditions are true:
   - The status of the claim is approved (APPR).
   - There is a vendor in the **Vendor** field.
   - The value in the **Contract Type** field is ITEMWARRANTY.
   - There is an aircraft or equipment identifier in the **Aircraft or Equipment** field.
   - There is a part identifier in the **Part** field.
   - There is a storeroom in the **Return to Storeroom** field.
   - There is a nonzero quantity in the **Claimed Quantity** field.
   - There is not already a number in the **Invoice** field or the **PO** field.
3. From the Action menu, click **Create No-Charge PO**.

Results

If any of the specified conditions are not met, you are notified that a PO cannot be created.

If all conditions are met, a message notifies you that the PO has been generated, and provides the PO number. The **Status** field of the warranty claim now reads CLAIM (claim submitted).

When the no-charge part on the PO is received, the quantity recovered on the claim is set to the total quantity of the receipts. If the quantity recovered is equal to or greater than the claimed quantity, the claim status is set to CLOSE (closed). The system then creates a return transaction that credits the aircraft or piece of equipment on the claim for the inventory value of the part. The return transaction directs the return of the part to the storeroom that is specified on the claim.

Chapter 14. Modules and applications

The IBM Maximo for Aviation applications are grouped into modules. You can access the modules from the **Go To** menu in the Navigation toolbar of the user interface.

Access to applications and to the features in applications are based on license and user role. You might not see some applications because they are not available with your license, or because they are not relevant to your role.

Administration module

You use the applications in the Administration module for system administration tasks. You can perform functions such as creating communication templates and setting up organizations.

Organizations application

You use the Organizations application to configure settings for models, SLAs, service addresses, bill batch copying, and billing.

Related information:

Configuring organization options for models

Configuring customer options for organizations

Resources module

You use the applications in the Resources module that is within the Administration module to create records about the people in your workforce. The people whom you document can include internal and external workers, and other people whose names or IDs might be listed on other records.

Configuration Management module

You use the applications in the Configuration Management module to configure and maintain configuration-managed aircraft or equipment and components.

Parts overview

Part records define the kinds of material and equipment that are stocked in your storerooms. Each part is associated with a specific part set and can be shared by the organizations that use the part set. You use the Part Number Master application to create part records.

When you create a part record, you specify what kind of part it is:

Consumable part
> Has a unique part number, will not be repaired or refurbished, and is not monitored for maintenance purposes.

Rotable part
> Has a generic part number that applies to interchangeable pieces of equipment that are associated with the part. You use the part number to track the movement of a part in and out of storerooms. You use the equipment number to track a specific instance of the part.

Configuration-managed part

> A configuration-managed part is a rotable part that is associated with a build position on a model and is under configuration-management control. Any operational changes to the piece of equipment that is associated with the part are validated against the rules defined for the model.

You must specify whether the part is managed as part of a batch. You can configure optional attributes to define how a part is tracked in your inventory. For example, you can assign a commodity code to a part, associate the part with a meter, and specify that a part is condition-enabled. For configuration-managed parts, you can also specify a category for the part and whether the part is software.

The **Part** tab includes sub-tabs that contain the following information:

- The models where the part is applicable. Configuration-managed parts are associated with at least one model. You can associate consumable parts with build items but these parts are not under configuration-management.
- Alternate parts that can be used as a substitute for a part, for example different brands of engine oil.
- Condition codes that apply to condition-enabled parts.
- For configuration-managed parts, associated master task cards and information about serial ranges.

Additional tabs and actions are available where you specify associated records for the part, such as inventory, price book, and vendor records.

Related tasks:

"Defining parts" on page 109
When you create a part, you specify initial attributes and then you can configure additional information, such as constructing part assemblies, adding parts to storerooms, associating parts with vendors, and specifying classifications for parts.

Aircraft and Equipment module

The Aircraft and Equipment module contains applications that are designed to manage the aircraft and equipment that are owned or leased by your company from the beginning to the end of the lifecycle of an aircraft or a piece of equipment.

Aircraft application

You use the Aircraft application to track physical aircraft and to store aircraft numbers and corresponding information, such as parent, location, vendor, status, and maintenance costs. You can build the aircraft hierarchy as an arrangement of aircraft, pieces of equipment, and subassemblies. The aircraft hierarchy provides a convenient way to roll up maintenance costs so that you can check accumulated costs at any level, at any time.

Use the Aircraft application to perform the following tasks:

- Select the **Aircraft Breakdown** tab to view a topological list of the aircraft record and the equipment that is installed on it.
- View, modify, add, or delete safety records for an aircraft. You define safety records in the Safety application
- View or add metering information for an aircraft. You define meters in the Meters application.

- Specify or view the specifications for an aircraft. You configure specifications in the Classifications application.

Related tasks:

"Creating aircraft records" on page 117
You create an aircraft record in the Aircraft application and associate it with a model that specifies the rules that apply when the aircraft is operational.

Equipment application

In the Equipment application, you can associate a piece of equipment with a location, and record additional information, such as aircraft operator, vendor, and purchase order. You can record and track equipment downtime and you can track the maintenance costs that are recorded on associated work orders. The accumulated costs are rolled up in an equipment assembly. In the Equipment Breakdown tab, you can select a node to view the rolled-up costs at that level of the hierarchy.

You can associate equipment records with warranties, meters, safety records, and audits and surveys. You can view associated work orders and specify work zones where labor and crew are assigned. You can also configure customer billing meters and record the usage of aircraft and equipment that you maintain for customers.

Use the Equipment application to perform the following tasks:

- Associate safety records with a piece of equipment. You define safety records in the Safety application
- View or add metering information for a piece of equipment. You define meters in the Meters application.
- Specify or view the specifications for a piece of equipment. You configure specifications in the Classifications application.

Related tasks:

"Creating equipment records" on page 117
You create equipment records in the Equipment application. Large pieces of equipment, such as aircraft engines, are typically associated with models. Smaller pieces of equipment are typically installed on the model that is associated with a parent aircraft or equipment record.

Equipment Templates application

You can specify common information about equipment in an equipment template that you can then apply to multiple pieces of equipment.

You can associate spare parts, meters, and data sheets with the template. Equipment records that are based on the template inherit these spare parts, meters, and data sheets. You can associate a specification with the equipment template on the Specifications tab.

Preventive maintenance information can also be specified for an equipment template. When the template is applied to existing or new equipment, associated task cards, which are based on the master task card, are created for each equipment record.

You can use equipment templates to create multiple pieces of equipment or to update multiple existing pieces of equipment.

Example

A company purchases 100 pressure gauges from the same manufacturer. The pressure gauges share the following identical information:

- Manufacturer
- Model number
- Description
- Operating range
- Accuracy
- Specifications
- Data sheets

A technician creates an equipment template to record all the data that is identical. The technician then generates the series of equipment records, for the pressure gauges, based on the template. They enter a serial number for each equipment number and apply any differences to individual pieces of equipment.

Locations application

You can track the current and past locations of aircraft and equipment including their performance at various locations.

You can associate a primary customer or vendor with a location. When a vendor is associated with a location, you can select the **Default Vendor Location?** check box to set the location as the default location for that vendor. Each vendor can have a default location for each site within an organization.

You can organize operating locations into hierarchical or network systems. Depending on your needs, you might have one or more systems. Regardless of how many systems you have, each site must have only one primary system. When you organize locations into systems, you can use the **Open Drilldown** action to quickly identify a location and the aircraft or equipment that is at that location.

The Locations application is used to perform the following tasks:

- View or specify detailed information for a location. For example, you can specify that the location is an inspection or quarantine location.
- Manage hierarchical or network systems of locations.
- View the history of transactions into and out of a location.
- Manage the safety records, meters, work zones, and audits and surveys that are associated with a location.
- Track meter readings for a specified location.
- View classification for a location.
- View the work details, tickets, and contracts that are associated with a location.

Related information:

Locations for service providers

Creating locations

You create location records to track the current and past locations of aircraft and equipment. You can also organize locations into logical hierarchical or network systems.

Procedure

1. In the Locations application, create a new location record.
2. In the **Location** field, specify a value, and type a description.
3. In the **Type** field, specify the type of the location. If you specify an **Operating** type of location, you can use the **Associate Systems with Location** action to add the location to a hierarchical system.
4. Optional: Specify additional information on the various tabs.
5. Save the location record.

MRO locations application

An MRO location represents the physical location of a facility where the maintenance, repair, and overhaul of complex aircraft or equipment occur. The MRO Locations application is used to schedule work packages efficiently and to define the physical location, classification, and capabilities of the site where the MRO activities occur.

The MRO Locations application is used by maintenance managers, planners, and schedulers to define MRO locations, such as bays, within an MRO location. Maintenance activities are allocated to the most suitable MRO location to maximize productivity.

An organization can have multiple MRO locations within a facility. You must create and specify an MRO location before you can schedule maintenance activities for that location. You can associate classifications, such as floor type or dimensions, with the MRO location.

A capability is a specialized task, such as EASA-certified repair, that an MRO location can perform. Capabilities can be added to an existing MRO location by using the MRO Location Capabilities table on the main tab. The capabilities of an MRO location might include, for example, approved certification procedures from the FAA and EASA.

You can define the physical relationships, such as being adjacent, between MRO locations to allocate different aircraft types to a combination of MRO locations. For example, you can combine MRO locations to accommodate a large aircraft.

A work package is a set of work that has a scheduled start and finish date. A work package can be related to only one MRO location. You assign work packages to an MRO location, which includes a scheduled start and finish date for the maintenance.

Related concepts:

"Planning maintenance locations" on page 67
Planning and scheduling maintenance activities for aircraft or equipment can be complex, because often the aircraft or equipment that requires maintenance is not in the correct location at the correct time. Maintenance location planning involves managing and scheduling assignments, crews, and materials at MRO locations.

Exchange Orders module

The Exchange Orders module contains an application for managing requests from customers as part of a customer pool management agreement.

Exchange Orders application

You use the Exchange Orders application to create and manage exchange orders as part of a customer pool management agreement. You can create and track exchange orders and receive and fulfill orders for parts that you supply from a pool.

In the Exchange Orders application, you can track all stages of the exchange order process. For example, creating and fulfilling an exchange order might involve the following stages:

- An airline has a defective part that was bought from your organization that needs to be replaced. A representative from the airline contacts the order desk at your organization and requests an exchange order.
- In the Exchange Orders application, the pool manager creates an inbound shipment request to request and receive the defective part from the customer. The request is sent to the shipping clerk.
- In the Shipments application, the shipping clerk approves the inbound shipping request, creates a shipment for the shipment request, and the airline returns the defective part.
- The part is recieved in the Receiving and Inspection application, and the part is sent for repair. When the part is fixed, it is sent to a pool.
- In the Exchange Orders application, the pool manager creates an outbound shipment request to have the replacement part sent to the airline. The request is sent to the shipping clerk.
- In the Shipments application, the shipping clerk approves the outbound shipping request, creates a shipment for the replacement part, and the replacement part is shipped to the airline.
- The airline is billed for the transaction fee and the cost to repair the defective part.

You can periodically update certain sections of an exchange order. For example, you can identify the priority of the exchange order and how fast the replacement part needs to be shipped to the customer. You can apply service level agreements so that related legal and contact information is readily available. All communication that is related to the exchange order can be stored in the **Log** tab.

Related information:

Customer pool agreements

Contracts module

You use the applications in the Contracts module to manage contracts. When you create a contract, you specify the properties, and terms and conditions of the contract, and you specify the aircraft or equipment, people, or licenses associated with it.

Purchase Contracts application

You use the Purchase Contracts application to maintain purchase contracts with outside vendors. On the contract, you can specify the items or services that are provided and their costs, shipping and handling, expected delivery times, financial terms, and vendor information.

In the Purchase Contracts application, in the **Scope** tab, you can define and review the scope of the purchase contract. The scope of the contract includes the fleets, aircraft, pieces of equipment, or parts that are covered by the contract. No changes

can be made in this tab after the contract is approved. Fleets must be defined in the Fleet Management application before you can select them for the scope.

You can create the following types of purchase contracts:

Blanket contract
> An agreement to spend a predetermined amount with the specified vendor over a period of time.

Price contract
> A list of the parts or services that are purchased from the specified vendor over a period of time at an agreed-upon price.

Purchase contract
> An agreement to purchase parts or services at an agreed-upon price with a vendor. To create this type of contract, you must have a purchase order (PO) that does not specify a maximum amount.

On the **Contract** tab, you can specify the maximum amount that a PO can have on a price contract or purchase contract. On the **Properties** tab, you can specify whether the maximum PO amount can be exceeded.

Before you can approve a purchase contract, you must have at least one authorized site.

Related information:

Creating purchase contracts for vendors

Financial module

You use the applications in the Financial module to monitor budgets and track costs.

Monitoring maintenance budgets

In the Budget Monitoring application, you can create budget records to monitor transactions in a financial period. Monitoring budget costs can help to ensure that projects or activities, such as work orders, are completed within an agreed budget and can improve estimation of the costs of future projects.

As an administrator, you can create budget records by configuring focal points and calculation rules. Focal points represent the item that you are monitoring in the budget record, such as aircraft, equipment, location, or general ledger accounts or components. You create focal points, for example, to track costs on check type master task cards for a specific model of aircraft. You can configure calculation rules that are based on estimated, approved, and actual costs.

Users create transactions for work orders, purchase requisitions, purchase orders, receipts, invoices, and issues. The budget records then monitor these transactions and are used to create reports.

Budget reports provide a summarized and detailed view of costs by type, such as labor, tools, services, materials. Budget reports also provide a summarized and detailed view of costs by status such as estimated, approved, and actual costs, and compare them with related budgeted amounts.

Related information:

Reporting module

Flight Log module

You use the applications in the Flight Log module to record and track information about flights.

Inventory module

You use the applications in the Inventory module to manage your inventory of consumable parts. You can maximize the availability of parts for upcoming work tasks, and also reduce excess inventory balances and related carrying costs.

Parts overview

Part records define the kinds of material and equipment that are stocked in your storerooms. Each part is associated with a specific part set and can be shared by the organizations that use the part set. You use the Part Number Master application to create part records.

When you create a part record, you specify what kind of part it is:

Consumable part
> Has a unique part number, will not be repaired or refurbished, and is not monitored for maintenance purposes.

Rotable part
> Has a generic part number that applies to interchangeable pieces of equipment that are associated with the part. You use the part number to track the movement of a part in and out of storerooms. You use the equipment number to track a specific instance of the part.

Configuration-managed part
> A configuration-managed part is a rotable part that is associated with a build position on a model and is under configuration-management control. Any operational changes to the piece of equipment that is associated with the part are validated against the rules defined for the model.

You must specify whether the part is managed as part of a batch. You can configure optional attributes to define how a part is tracked in your inventory. For example, you can assign a commodity code to a part, associate the part with a meter, and specify that a part is condition-enabled. For configuration-managed parts, you can also specify a category for the part and whether the part is software.

The **Part** tab includes sub-tabs that contain the following information:
- The models where the part is applicable. Configuration-managed parts are associated with at least one model. You can associate consumable parts with build items but these parts are not under configuration-management.
- Alternate parts that can be used as a substitute for a part, for example different brands of engine oil.
- Condition codes that apply to condition-enabled parts.
- For configuration-managed parts, associated master task cards and information about serial ranges.

Additional tabs and actions are available where you specify associated records for the part, such as inventory, price book, and vendor records.

Related tasks:

When you create a part, you specify initial attributes and then you can configure additional information, such as constructing part assemblies, adding parts to storerooms, associating parts with vendors, and specifying classifications for parts.

Service Part Numbers application

Service parts are services such as grounds maintenance or plant security. They are not associated with an aircraft or piece of equipment. Services can often include labor, tools, and materials but are billed as one unit. Services can be provided to customers on a frequent or infrequent schedule. You maintain service part records in the Service Part Numbers application and bill for service parts on a billing schedule.

You create service part records in the Service Part Numbers application. When you create service part records, you specify the vendors who will provide the services. Services can be requisitioned from external vendors or fulfilled from internal providers or a combination of both. When services are fulfilled from internal providers, you can record actual costs on work orders without the requirement for a purchase requisition.

You can limit the access to service part data for customers by associating those customers with a service part number. Then, only users who can access that customer data can see the service part data.

The Service Part Numbers application has multiple features that are tailored for service providers that manage aircraft or equipment.

Related tasks:

You use the Service Part Numbers application to create a service part record. A service part record identifies the part, lets you associate information with a part, and view or manage a list of vendor companies that supply service parts.

Tools application

You use the Tools application to manage information about the tools used to perform work. Tools are typically nonconsumable parts for which you charge an hourly rate for their use. Examples of tools include air compressors, nail guns, calibration equipment, and heavy equipment such as cranes and excavators.

When you create a tool record, you define the main attributes of the tool (such as commodity codes, issue unit, whether the tool is batched or rotating), along with any alternate tools that can be used in its place and a list of the qualifications necessary for a person to use the tool. All tools are marked as capitalized.

Tools are defined at the part set level, so several organizations can share a tool set. Some of the data on a tool record can be specific to an organization or site. For example, the storerooms for a tool are managed at the site level. Vendors for a tool are managed at the organization level.

In the Tools application, you can perform the following tasks:

- Catalog tools in a part set, which can then be shared by organizations that use the part set.
- Add the tool to one or more storerooms.

- Use the tool on job plans and work orders (when you use a tool on a work order, the tool can be reserved in the specified storeroom).
- Issue, receive, and transfer tools from storerooms.
- Specify the tool rate, general ledger accounts, associated vendor, tax-exempt status, and tax codes that vary by organization.
- Specify the percentage of tools that can be received over the quantity ordered in the initial agreement. The percentage value is applied to the organization level and to the vendor level when the tool record is created.
- Add a list of vendors that carry the tool.
- List the specification for the tool.
- Copy or delete a tool.
- Attach external documents that relate to the tool.

Related tasks:

A tool record defines a tool and allows you to associate information with the tool. Tools are used to perform work, such as building, maintenance, and repairs.

Inventory Usage application

With the daily use of inventory parts and tools, inventory materials must be moved between storerooms to supply the different areas of a site. You use the Inventory Usage application to create inventory usage records that track the issue, transfer, and return of inventory parts within and across organizations.

You can monitor the balance of inventory parts that are in stock, and you can issue parts or tools directly to charge entities such as work orders, locations, or aircraft or equipment. You can also issue parts or tools against a general ledger account on-site, across sites in an organization, or across organizations.

Inventory application

You use the Inventory application to track the movement of parts in and out of storerooms and when you issue them to work orders, locations, aircraft, or equipment. You can view and create parts in the Part Number Master application. Configuration-managed parts are generated automatically when you create models.

Inventory of parts

Parts are available in the Inventory application, where you can record storeroom balance, condition, inventory costs, reorder details, and other management information for parts.

The following activities help to manage parts:
- Identify and track equipment that is associated with a rotable part.
- Identify and track parts that have a related configuration-managed part record.
- List all aircraft or pieces of equipment for which a configuration-managed part is listed as a subassembly or a consumable part.
- Create default parts for fuel, replenishments, and munitions if you plan to manage these items in your inventory.
- View the receiving and inspection line records for a storeroom and a part on the **History** tab.

Issue and transfer of parts

In the Issues and Transfers application, you can issue parts and tools to a work order, to a location, to an aircraft or piece of equipment, or against a general ledger account either within a site or across sites within an organization. You can define the part, the model, and the configuration that is associated with an aircraft or piece of equipment that you issue.

You can transfer parts and tools from one storeroom to another, either within the same site, across sites in an organization, or across organizations. When you transfer parts between storerooms, the storeroom balances are adjusted automatically. You can also return parts and tools to a storeroom, but only if they are in the same site. You can perform transfers within your organization without an internal purchase order. Transfers to a different organization require an internal purchase order, and the organizations must share the same item set.

Part Number Masters application

In the Part Number Master application, you can create parts and associate them with master task cards. You also specify the format of the serial numbers for the part, and you can specify serial number ranges that use this format.

The Models application uses the serial numbers and serial range expressions to establish configuration rules for models and configurations of models. The Aircraft application or Equipment application uses the serial numbers and serial range expressions to validateaircraft or equipment configurations by using those configuration rules.

Examples of serial formats

To specify the format for a serial number, the letter A represents alphabetic characters, the number 9 represent numbers, and any special characters can represent separators. The following examples show a valid format and an invalid format:

- A-9999 is a valid serial format.
- X-9999 is not a valid serial format because it contains the letter X.

Examples of serial range expressions

All serial numbers in a serial range must be in a valid serial format. You can specify multiple serial numbers and serial ranges at the same time by using the following construction:

- To specify multiple individual serial numbers, separate them with a comma and no space, such as A-0001,A-0100,A-2020.
- To specify a range of serial numbers, separate the first and last number of the range with two periods and no spaces, such as A-2001..A-2999.
- To specify a combination of individual numbers and ranges, separate the entries with a comma and no space. You can enter numbers and ranges in any order, such as A-0001,A-0100,A-2001..A-2999,A-4001..A-4999.

Related tasks:
"Adding parts to storerooms" on page 111
You can add a part to the inventory for a storeroom. An inventory record is created when you add a part to a storeroom.

Storerooms application

You use the Storerooms application to add and maintain information about storeroom locations, as well as view the parts stocked within a storeroom. You also use this application to associate the general ledger accounts with each storeroom, define the lead time calculation for parts in a storeroom, and flag the storeroom to function as an internal supplier to other storerooms.

You can designate the default storeroom for a site through the Storerooms application. The first storeroom you create in a site is selected as the default storeroom for that site. Because a default storeroom exists for each site, you do not have to specify a storeroom on task cards or job cards unless you want to use a different storeroom. Parts are automatically reserved from the default storeroom.

Planning module

You use the applications in the Planning module to plan how work should be performed, such as creating job cards that outline the steps that must be performed for each type of job.

Job cards

A job card is a detailed description of work that is performed for a work order. You use the Job Cards application to create and manage job cards.

When you create a job card, you specify planning and scheduling information that can be used by the Task Cards and Work Order Tracking applications. You can specify the maintenance review board (MRB) number, capability, class, and category for the job card. You can also specify the operation number, work station, phase, CMR, and customer for the job card.

You can populate a job card from an operation list in a maintenance planning document (MPD) that is provided by a manufacturer. Use the Maintenance Task Library (MTL) application to create MTL records, import MPD job card data into them, and manually add job cards. You can also manually configure information in a job card in the Job Cards application by using the look up actions on fields to locate the related information from database records and domain values.

Operations that are on the job card include information that is gathered from other applications and describe the following aspects of the work:
- Labor is defined in the Labor application and can include information about skill sets and labor costs that are calculated for the time that it takes to perform the operation.
- The materials that are required to complete the work include parts that are available from the Inventory application and consumable parts that are defined in the Equipment application.
- Service items that are required to complete the work are available from the Service Items application, which can include unit costs and vendor information if they are available.
- The tools required to complete the work and their costs are available from the Tools application.
- Access items that must be opened and closed to provide access for the work are available from the Models application.
- Information that indicates the aircraft zones where the work occurs are available from the Zones application.

When you associate a job card with either an aircraft or piece of equipment, a CM part, a location, or a part, the job card becomes effective for that record. You can also associate a safety plan with a job card and specify the sites and organizations for which it is effective. The **Operators Maintenance Program Details** action enables you to view information about OMPs and associated master task cards that are related to the job card.

You can duplicate a job card to use as a template for a new job card, and you can create a revision of a job card that is in active status. When you create a revision, the record is copied into a new job card, and the revision number is incremented by 1. The original job card status remains in the active status, and the new job card is set to pending revision. When the new job card is activated, the original job card status is set to revised.

You can apply job card records to task card records and work orders. After a job card becomes a work card on a work order, you can change the work card without affecting the job card. In the Master Task Card application, you can select the **Add/Replace Job Card** action to specify the new job card that you want to add to the master task card. If the master task card has an existing job card, the new job card replaces the existing job card.

You also can create a job card from a work card that you use frequently.

Related information:

Customers and job cards

Planning and Scheduling module

You use the applications in the Planning and Scheduling module to schedule labor and MRO locations for maintenance work.

Task Card module

You use the applications in the Task Card module to manage the work performed on a regular schedule to keep aircraft or equipment running efficiently. The applications can help you to plan and budget for regular maintenance work by planning the labor, material, service, and tool needs of your regularly scheduled maintenance and inspection work orders.

Work packages

A work package defines a set of maintenance tasks that are performed on an aircraft during a specified maintenance period. Work packages include details about the tools, materials, labor, skills, and repair locations required to perform the work. You can associate a work package with a customer and a related customer agreement.

When you create a work package, you must add the main work order. The work order must be associated with an aircraft or piece of equipment, must be in the open status, and cannot be associated with another work package. The following values are set in the work package from values that are provided by the main work order:

- Scheduled start and end dates for performing the work which you can modify
- Read-only values in the **Start No Earlier Than**, **Start No Later Than**, and **Estimated Duration** fields

After you add the main work order, you can add the following information to the work package:

- You specify the aircraft that the work package applies to.
- You can specify an MRO location where the work is to be performed.
- If the work package is for a customer, you can specify a customer and customer agreement.
- You can modify the scheduled start and end dates.

After you add the main work order, you can use the **Add Tasks and Work Orders to Work Package** action to add any combination of valid work orders and task cards to the work package. A valid work order or task card satisfies the following conditions:

- It is related to the aircraft to which the work package applies.
- It has a relationship to the customer, if a customer is specified.
- It is not associated with another work package.

You can use the Maximo Integration Framework to import a set of work orders that a customer provides. You can then create a work package with these work orders and validate the work package against a copy of an OMP that a customer provides.

Operator maintenance programs

Aircraft operators define operator maintenance programs (OMPs) and associated maintenance checks for each type of aircraft type in their fleet. When the maintenance program is approved by the aviation authority, the OMP is activated and becomes the controlling document for maintenance of that aircraft.

In the Maintenance Task Library (MTL) application, MRO operators can import copies of OMPs that control the maintenance of aircraft that they are servicing for customers. The imported OMPs can be viewed and managed in the OMP application.

Aircraft operators can define and revise OMPs in the OMP application before submission to aviation authorities for approval.

An OMP record is associated with at least one model and is effective, by default, for all aircraft or equipment that are associated with the specified model or models. Maintenance changes to the effective aircraft and equipment are validated against the models to ensure continuing compliance. When an OMP is in draft status, you can remove selected aircraft from the effectivity list.

An OMP typically contains many hundreds of OMP tasks that have associated master task cards. The list of OMP tasks can be compiled from one or more of the following sources:

- Maintenance Task Library (MTL) records that contain task information from maintenance planning documents (MPDs) or other sources
- Master task card records that are maintained in the Master Task Cards application

In an OMP, you can create and manage a sampling program of maintenance tasks for an aircraft fleet. To create a sample group, you indicate an aircraft in your fleet

as a sample aircraft. The sample group is approximately 20 percent of the aircraft in the fleet. The sample group contains the oldest aircraft and the newest aircraft in your fleet.

You determine which aircraft in the fleet are the oldest and the newest based on the manufacture date and manually select the aircraft that are in the sampling program. After you indicate that an aircraft is part of the sampling program, you define the sample interval and sample threshold of the maintenance tasks in the Master Task Card application.

In OMPs, maintenance checks group related tasks that occur at the same intervals. In Maximo for Aviation, a check is a type of master task card that you configure in the OMP application. On the **Checks** tab, when you add a check, you add OMP tasks to the check content. Because the check is a master task card, when the OMP tasks are due, work orders are automatically generated and warnings are issued when work is about to become due.

The checks in an OMP are typically organized in a hierarchy, where the first level of checks are the lowest and the fourth level of checks are the highest. You can use a naming convention to distinguish the check hierarchy, for example, A checks are the lowest, then B and C, and D checks are highest. Lower checks are, typically, frequent light checks that can be completed at a line maintenance location. Higher checks are often heavy maintenance tasks that occur less often and require the aircraft to be in a hangar for a number of weeks.

To configure the hierarchy of checks for an OMP, on the **Checks** tab, you configure higher and lower relationships with other checks on the OMP record. For example, if you relate checks A and B, because A is the lower check, when check A runs, check B does not run. When check B runs, check A also runs.

After you define the higher and lower checks, you can create a check loop that breaks down the series of maintenance task requirements into a sequence of related checks. You associate higher and lower checks with the check loop and specify the order of the checks in the sequence. You also specify the frequency at which the maintenance tasks occur in the check loop. When a check loop is completed, it repeats.

Example check configuration

The following table shows example checks:

Table 23. Example checks

Check ID	Frequency in flight hours	Number of master task cards
A1	600	70
A2	1200	28
A3	1800	21
A4	2400	18

The following table shows an example of check loop frequency:

Table 24. Frequency of checks in a check loop

Interval flight hours	Cumulative flight hours	Higher checks	Check content (lower checks)	Number of master task cards
600	600	A1	A1	70
600	1200	A2	A1, A2	98
600	1800	A3	A1, A3	91
600	2400	A4	A1, A2, A4	116
600	3000	A5	A1, A3	91
600	3600	A6	A1, A2, A3	119
600	4200	A7	A1	70
600	4800	A8	A1, A2, A4	116
600	5400	A9	A1, A3	91
600	6000	A10	A1, A2	98
600	6600	A11	A1	70
600	7200	A12 (Sequence repeats from A01)	A1, A2, A3, A4	137

Related concepts:

"Weight and balance management" on page 55
To meet regulatory compliance, you must manage and maintain the weight and balance for all of the aircraft in a fleet. IBM Maximo for Aviation 7.6.3 calculates and monitors changes in the weight and balance of an aircraft based on a predefined formula.

Maintenance task library

Maintenance task library records contain lists of task card records that are imported from maintenance planning documents (MPDs), operator maintenance programs (OMPs), or other technical documents. MTL records can be used to configure the tasks for OMP records.

MPDs can contain thousands of tasks that are imported as task card records. OMPs can contain hundreds of tasks that are imported as master task card records. During the import, tasks are checked to ensure that all required information is provided in the correct format. Any errors are reported, and you must resolve them to complete the import.

When you create an MTL record, a revision value of 0 is set. When you import tasks from a file, the tasks are associated with this revision. If you receive an updated version of a file, you revise the MTL record to import the new version of the file. The tasks that you import are associated with revision 1. MTL revisions enable you to simultaneously manage multiple revisions of an MPD or OMP.

On an MTL record, you can import the details for the sample threshold and the sample interval frequency for maintenance tasks for the aircraft that are in a sampling program.

Master task cards

A master task card is used as a template to create task cards. You can create a schedule to generate work orders to ensure that the required maintenance is done in a timely manner. You create master task card records in the Master Task Cards application.

Task cards

Task cards are used to generate the work orders that specify scheduled maintenance work. Task cards can contain job card and corresponding safety plan information that is copied to work orders. You can enable version control of task card records to track revisions of task cards.

Purchasing module

You use the applications in the Purchasing module to manage the purchasing process, including obtaining requests for quotations (RFQs), purchasing the materials and services, and then receiving and invoicing them. The applications also help you to maintain information about the companies from which you purchase, and to integrate legal terms and conditions into the purchasing process.

Purchase Requisitions application

You use the Purchase Requisitions application to create and manage purchase requisitions for configuration-managed parts, for supplies, or for services. You can also use this application to create purchase orders from purchase requisitions.

A purchase requisition (PR) is a written request issued internally to a purchasing department to order parts or services.

You can create two types of purchase requisitions:

Internal purchase requisitions
> Used for requesting the transfer of materials from another company storeroom.

External purchase requisitions
> Used for requesting the purchase of the necessary materials from an outside vendor. You can specify the vendor.

Related information:
Creating purchase requisitions

Purchase Orders application

You use the Purchase Orders application to create and manage purchase orders for configuration-managed parts. A purchase order is an authorized order from a purchasing agent or department to an internal supplier or external vendor.

With this application, you can create change orders. You can also generate internal purchase orders against another storeroom. A storeroom-to-storeroom purchase can be thought of as a transfer order or an internal purchase order since the product uses the Purchase Orders application and the Issues and Transfers application to track these types of part movements.

If a vendor or supplier cannot deliver an ordered part, an alternate part can replace it. The alternate part can be accepted if the airworthiness of the aircraft is

not adversely affected. Each contract can list alternate parts that can be used to replace the original part. An alternate part that is not listed in the contract cannot be selected as the replacement.

You can create purchase orders by using the following methods:
- From the Purchase Orders application
- From the Purchase Requisitions application
- From a request for quotation (RFQ) in the Request for Quotations application
- From the Inventory application by using the inventory reorder actions
- From the Purchase Contracts application by creating a release

Related information:

Creating purchase orders

Shipments application

You use the Shipments application to manage and track the transportation of parts to and from your location to ensure that the target delivery times that are on service level agreements are met. Shipment records contain information, such as the weight and value of shipments, transportation methods used, and key shipment dates.

Shipment records consist of one or more shipment lines. The **Shipment Lines** tab provides details about the parts that are included in the shipment. On the **Shipment Lines** tab, you can create a new shipment line and specify details about the parts to be shipped, or you can add shipment requests that were previously generated by another process. Shipment requests can be initiated by various processes, for example, from an exchange order, a loan order, a purchase order, or a repair order.

You can reduce shipment costs by reviewing and consolidating multiple shipment requests to the same location into a single shipment. You can also create multiple shipment records from multiple shipment requests by selecting the **Copy Shipment Requests to Shipments** action.

Related tasks:

Creating shipments

"Exchange orders" on page 177
Exchange orders manage requests from customers as part of a customer pool management agreement. You can track the request, and receive and fulfill orders for parts that you supply from a pool. For example, you might receive a request to supply a replacement for an airplane cabin sensor that malfunctioned.

Shipment Receiving application

You can create shipments in the Inventory Usage application to transfer inventory parts or tools between storerooms within the same site or across sites and organizations and track their delivery. You create shipment receipt records to acknowledge the receipt of the parts in a shipment and to update inventory balances at the destination storeroom.

Shipment receipt records log information such as the quantity of parts that were received, the date of receipt, and the destination storeroom for the parts in the shipment.

When the shipped parts are received, the storeroom balance is updated for the inventory records at the destination site. The quantity of received parts is verified to determine whether the number of shipped parts satisfies the requirement at the destination site. The shipment is considered to be complete or partial based on this requirement and the status of the inventory usage record is updated accordingly.

You can void a shipment receipt transaction that was created in error to return the record to its former state and resolve storeroom balances. A voided receipt has the same effect on storeroom balances as a return, but a voided receipt cannot be used on a credit invoice. The following conditions apply to voiding a shipment receipt record:

- You can void consumable items.
- You can void shipment line items that are in Waiting for Inspection (WINSP) status.
- You can void shipment line items that have been inspected but not returned.

The following table lists the statuses that can apply when you receive parts that require inspection:

Table 25. Status values for receiving parts that require inspection

Status	Description
Waiting for Inspection (WINSP)	The part is in the process of being received but is not entered into inventory. The part is in a holding location, where it stays until the inspection is complete. After inspection, the part status changes to either Waiting for Serialization or Complete, depending on whether it is a rotable or consumable part.
Waiting for Serialization (WASSET)	Indicates that the part is rotable and that review and acceptance of the aircraft or equipment serial numbers in the receipt is required. If the part requires inspection, the inspection has already occurred. The part is still in the holding location; it has not been sent to its destination storeroom or to its direct issue location. After the part is serialized, the status is changed to Complete.
Complete (COMP)	Indicates that the part was received, and if necessary, inspected and serialized. When the status of the part changes to Complete, an inventory transfer transaction is created. The part is transferred to the appropriate storeroom or to a direct issue location. If the part is nonrotable and does not require inspection, its status is Complete when it is received.

Receiving and Inspection application

When parts are delivered or when rotable parts are repaired, you use the Receiving and Inspection application to track the receipt of the parts into your inventory and initiate necessary inspections. If a nonconformity is detected during inspection, you record the details and assign the part to a quarantine location for further review.

In the Receiving and Inspection application, you can manage the receipt and inspection of parts for external purchase orders, repair orders, lease orders, and loan orders. The Select Parts to Receive window lists the order lines that are available to receive into a storeroom for a purchase order or repair order. Each order line includes the quantity that was ordered and indicates whether a part is rotable, configuration-managed, or managed by batch, and whether it requires inspection. You can reject any or all of the order lines.

Each order line has a number of line items, depending on the quantity ordered. Specify a serial number for each line item that you want to accept. If a part is a consumable part that is managed by batch, or lot, you specify the batch number and quantity details.

When you receive the parts, entries are added to the Receipt and Inspections table based on the type of part on the originating order line:
- For consumable parts that are not managed by batch, or lot, one receipt row is created for an order line.
- For consumable parts that are managed by batch, a receipt row is created for each batch number on an order line.
- For rotable parts, a receipt row is created for each serial number on an order line.
- For material receipts, one receipt row is created for an order line.

You can continue to review and remove lines from the table until you save the Receipt and Inspections record.

Some parts must be inspected before they can be entered into inventory. If a nonconformity is detected during the inspection process, you record the details by using the **Change Inspection Status** action, and send the affected parts to quarantine. Parts remain in quarantine until they are reviewed and assigned for use, returned to the vendor, or scrapped.

When all receipt and inspection lines have a status of complete, the status of the receipt and inspections record is also set to complete. If any lines do not have a status of complete, the receipt and inspections record cannot be complete.

When you create a receipt and inspections record, corresponding inventory records are created, and received parts are moved into the appropriate storeroom or location.

Related information:

Receiving and inspecting parts

Invoices application

You use the Invoices application to record vendor invoices as you receive them. You can also record debit and credit notes from vendors, and match invoice details against purchase orders and receipts. You can reverse approved or paid invoices, credit memos, or debit memos. Items that are part of the consignment inventory can be invoiced when the items are used.

Entering invoices lets you match the invoice information against purchase orders and receipts of materials and services. The invoice can then be approved and routed to Accounts Payable.

You create invoices that can represent one of the following invoice types:

An invoice related to a single purchase order
You enter information such as the invoice number, and the corresponding purchase order number on the **Invoice** tab. Any receipts recorded for the purchase order can be invoiced on the **Invoice Lines** tab. If the same purchase order number exists for multiple sites, then you can select the site for the purchase order.

An invoice related to many purchase orders for a single vendor
You enter general invoice data on the **Invoice** tab, including the vendor, then list the related purchase orders on the **Invoice Lines** tab.

An invoice without a related purchase order for a single vendor
Typically, such an invoice represents a bill for which there is no purchase requisition or purchase order. You enter invoice-specific information about the **Invoice** tab. This type of invoice might be appropriate if, for example, you receive an invoice for rent or for a telephone bill.

An invoice with purchase order sites that are different from the site from which the invoice is generated
The invoice must be associated with the same organization as the purchase order sites.

An invoice for items that are created as consignment items
A consignment payment invoice can be generated, either manually or automatically, for financial transactions that occur when consignment items are consumed from a storeroom.

Related information:

Recording invoices from vendors

Request for Quotations application

You use the Request for Quotations application to create and manage request for quotations (RFQ) for configuration-managed parts. Based on the quotations, you can assess the vendor who best meets your needs.

An RFQ is a request that you send out to one or more potential vendors. To list a vendor on the Request for Quotations application, the vendor must have a record in the Companies application. In the Request for Quotations application, you can specify line items, required delivery dates, and other conditions that you want the vendor to meet for the delivery of a part or a service.

You can create an RFQ for any of the following conditions:
- The stock count of a part is less than a certain level, and you must place another bulk order.
- A requisition is received for a part or for a service that requires a quotation each time because of price or other requirements.
- Someone at your site requests a quote for a part or for a service. It can be for a stocked part or for a non-stocked part, such as a special order.
- You need to do commodity bulk buying for a certain period of time. This is typically for many parts with common commodity codes. The quotation might not be copied to a purchase order immediately, but the pricing is set.

When you receive the quotations from the vendors, you insert them into the Request for Quotations record one line at a time. At the end of the process, you review the quotations and award one quotation for each line. The quotations are then converted to one or more purchase orders or contracts, depending on the procurement flow within your organization.

Related information:

Creating requests for quotations

Companies application

The Companies application maintains detailed information about vendors, manufacturers, and other companies.

Vendors can have parent companies. There can be multiple vendor locations for a single company. Using reports, you can determine total year-to-date expenditures with a single organization, regardless of its location. Company information must be entered in the Companies application first so that other modules, such as Inventory and Purchasing, can access the information.

With the Companies application, you can perform the following tasks:
- You can associate commodity codes with a vendor.
- You can add a commodity group to the database.
- You can add or modify a commodity code in a commodity group.
- You can bookmark a record so that I can view it at a later time.
- You can create a company record.
- You can delete a record.
- You can duplicate a record.
- You can view contract information related to the company.
- You can view location information related to the company.

Related information:

Creating company records for vendors

Company Master application

You use the Company Master application to create company master records that belong to a particular company set. You can also use the Company Master application to associate a company master record with an organization.

Company master records contain information pertaining to companies, such as the default contact person for the company. Company master records also contain purchasing details and payment details for the company.

With the Company Master application, you can perform the following tasks:
- Add a company master record to an organization
- Bookmark a record so that you can view it at a later time
- Create a company master record
- Delete a record

Note that if a company master record is associated with an organization, you cannot delete the record.

All company master records in the database belong to a company set. With company sets, you can share information about companies between multiple organizations. Each organization is associated with a company set.

Related information:

Creating company master records for vendors

Terms and Conditions application

You use the Terms and Conditions application to specify and to maintain a library of terms and conditions. You can add the terms and conditions to a purchasing document or to a contract. Terms can contain information such as liability concerns, shipping and handling details, and delivery time expectations.

The terms entered in the Terms and Conditions application are available from tabs in the purchasing and contract applications. From the tabs, you can select a term from the library to associate with a purchasing record or with a contract record.

Related information:

Defining terms to apply to purchase orders

Release module

You use the Activities and Operations application to plan, review, and manage activities and operations. When you create an activity, you initiate the work process and create a historical record of the work being performed.

Safety and Quality Management module

You use the applications in the Safety and Quality Management module to conduct audits and surveys of the safety environment of your employees and of external vendors. You can create defects for issues that are identified by audits and surveys, track actions taken, and maintain related regulation records.

Audits

To evaluate compliance with industry-related regulations or with internal regulations, you can use audits. You can conduct audits of aircraft or equipment to compare operations across locations. You can also request an external audit to acquire a level of confidence in the quality of the external provider.

For example, if your company is going to charter a ship to move equipment from one location to another location, you can conduct an external audit. You can customize the questionnaire to ask the shipping company about the age of the vessel and the experience of the captain and the crew. You can also inquire about whether any accidents occurred during the past five years.

Related tasks:

"Evaluating regulatory compliance by using audits and surveys" on page 183 Audits provide a way to verify that personnel are complying with internal or external regulations. Surveys provide a method of assessing the safety climate and culture of an organization, or of gathering information in specific areas. You can use the resulting data to recommend follow-up actions.

Action tracking overview

Actions are agreements between organizations or different parties within an organization to track required work. You use the Action Tracking application to maintain action records and report the status of the work that is performed.

The issuance of requirements, advisory notices, or safety bulletins from regulatory agencies or manufacturers might lead you to create actions.

One organization performs the work and reports the status of the work to an external organization or another part of the internal organization. An external organization might be a regulatory agency. An internal organization might be a maintenance organization that is responsible for actions that arise from internal management audits.

In the Action Tracking application, you can perform the following activities:

• Determine the work that must be done to meet an action.

- Identify the aircraft or equipment that are affected by an action.
- Associate aircraft or equipment lists and standard action groups with an action.
- Generate task card records for the identified aircraft or equipment.
- Generate work orders for an action.
- Associate task card records and work orders with a work package.
- Track the status of work that is required to meet an action.
- Identify the people who are part of the review process.

Related concepts:

"Action tracking overview" on page 193

Actions are agreements between organizations or different parties within an organization to track required work. You use the Action Tracking application to maintain action records and report the status of the work that is performed.

Defects overview

You can document and track defects, associate existing solutions with defects, and create draft solutions. You can record defective aircraft or equipment that do not comply with industry standards and regulations. You can link defects to audits that are conducted as the result of a nonconformance.

The following examples are defects:
- A noisy speaker in a cabin
- A flashing light at a passenger seat

If a defect requires a follow-up activity, you can generate the following types of records from this application:
- Action
- Defect
- Service request
- Work order

Defect records can also be created automatically from such sources as email, system monitoring tools, and external applications.

To record information about events that have a health, safety, or environmental impact, use the Incidents application.

The status of a defect indicates its position in the processing cycle and the actions that can be performed on the record. A defect can have one of the following status values:

NEW This status is the default status of a new defect. You can delete a record that has this status.

QUEUED
Ownership of the defect is assigned to a person or person group. You can delete a record that has this status if it meets the following criteria:
- It is not related to other records.
- It does not have workflow history.
- It does not have work log entries.

INPROG
Work on the defect is in progress.

PENDING

The defect is pending an external action, for example, a vendor or user callback or delivery of parts.

WOR Waiting on review. Someone must inspect the defect and decide what action to take. You can delete a record that has this status if it meets the following criteria:

- It is not related to other records.
- It does not have workflow history.
- It does not have work log entries.

RESOLVED

Information has been gathered and routed, service has been restored, or a solution has been provided. You can reopen a defect by changing its status from RESOLVED to INPROG.

CLOSE

The defect is finalized. After the record is closed, you cannot change the status. After you cancel a defect, it becomes a history record and you can change it only by selecting the **Edit History Defect** action.

Related concepts:

"Defects overview" on page 191
You can document and track defects, associate existing solutions with defects, and create draft solutions. You can record defective aircraft or equipment that do not comply with industry standards and regulations. You can link defects to audits that are conducted as the result of a nonconformance.

Maintaining operating procedures

You use the Operating Procedures application to provide reference information about standards and procedures that are associated with job cards. You can associate standard actions with lines in an operating procedure, and you can assign ownership to operating procedures

Operating procedures apply to job card tasks and work order tasks. When tasks on a job card contain operating procedures, the operating procedures are copied to the work tasks on work orders that use the job card.

Related concepts:

"Maintaining operating procedures" on page 191
You use the Operating Procedures application to provide reference information about standards and procedures that are associated with job cards. You can associate standard actions with lines in an operating procedure, and you can assign ownership to operating procedures

Regulatory compliance overview

You can create regulation records to help comply with guidelines, standards, and legal requirements that apply to employee health and safety of the work environment.

You can associate active regulation records with planned and actual work in the following types of records:

- Aircraft
- Equipment
- Job card
- Location

- Work order

Related concepts:

"Regulatory compliance overview" on page 194
You can create regulation records to help comply with guidelines, standards, and legal requirements that apply to employee health and safety of the work environment.

Security module

You use the applications in the Security module to implement and manage security for users and groups.

Related information:

Customer Objects Security application

Security Groups application

Users application

Self Service module

Self-Service users with appropriate permissions can register themselves in the system and use the applications in the Self-Service modules to create records without the assistance of an administrator or a service desk agent.

Service Desk module

You use the applications in the Service Desk module to manage customer requests for help, information, and services.

You can create and manage service requests which are a type of ticket, manage activities that are a type of work order and tasks that describe general work that needs to be done on a ticket. You can also create a ticket template based on a standard model to reduce the time spent entering information in a ticket.

Service Level module

You use the Service Level module to create and manage service level agreements which document the commitments between service providers and customers. You can also create a service group for each type of service that you provide or procure.

Service Provider module

You use the Service Provider module to manage customer agreements, customer billing, billing reviews, and sales orders.

System Configuration module

The System Configuration module contains the Platform Configuration module and the Migration module.

You use the applications in the Platform Configuration module to perform numerous tasks, such as configuring the database. You use the applications in the Migration module to migrate configuration content from one environment to another.

Warranties module

The Warranties module contains applications for tracking warranties on your aircraft, equipment and parts, and managing warranty claims.

Work Orders module

You use the Work Orders module to track the work that has been performed in the past, and future work that is being planned.

Work Order Tracking application

In the Work Order Tracking application, you create and manage work orders for aircraft, equipment and locations. A work order specifies a particular task, and the labor, materials, services, and tools needed to complete the task.

A work order contains information about the aircraft, equipment and location, and can include information about associated models, customers, billing, and scheduling. You can create a discrepancy for a work order when a work order is created. You can also create a discrepancy after a work order is created by using the **Create Discrepancy** action. If a discrepancy exists for a work order, the **Related Discrepancy** check box for the work order record is automatically selected.

You can create work orders in applications other than Work Order Tracking including the Master Task Card application or Service Requests application.

Related information:

Work orders for service providers

Labor Reporting application

You use the Labor Reporting application to report the type and the total number of hours of work that external contractors or internal employees performed.

The Labor Reporting application contains a single window that displays labor transaction records. Use the Transactions table window to perform the following actions:
* Create labor transactions.
* Modify labor transactions.
* Delete labor transactions.
* Approve labor transactions.
* Invoice labor transactions.

You can also create labor transactions in other applications by using the ticket timer features.

Quick Reporting application

You use the Quick Reporting application to plan, to review, and to approve work orders for aircraft, equipment, and locations. When you create a work order, you initiate the maintenance process and create a historical record of the work being performed.

You use the Quick Reporting application to perform the following additional functions:
* Create work orders, view work orders, and modify work orders.

- View task card and scheduling information.
- See which job card and safety plan are applied.
- Report actual labor, materials, and tool use.
- View and enter failure information.
- View the originating work order for a follow-up work order.

Assignment Manager application

You use the Assignment Manager application to dispatch labor and schedule work for your organization.

Using the Assignment Manager application, you can view the requirements that were created from the work card, as well as the unplanned work on a work order. You also can add new requirements to the work list.

You also can view work order assignments and associated craft, skill level, vendor, contract, and organization requirements. You can specify whether to view labor that applies to specific requirements, or to view work order requirements that fit the craft, skill level, vendor, contract, and organization requirements, calendar availability, or shift of displayed labor.

If a default labor query was selected in the Labor application, the labor list displays a filtered list of available labor codes. If there is no selected query, the Labor List displays all the labor in the database. To schedule labor codes, both a calendar and a shift must be specified on the person record in the People application.

To facilitate dispatching work assignments, the work list is color coded to indicate work requirements by priority. You can change the color choices and priority ranges to fit your business needs.

Chapter 15. Glossary

This glossary provides terms and definitions for the Maximo for Aviation software and products.

The following cross-references are used in this glossary:

- *See* refers you from a nonpreferred term to the preferred term or from an abbreviation to the spelled-out form.
- *See also* refers you to a related or contrasting term.

For other terms and definitions, see the IBM Terminology website (opens in new window).

A

access item
A point of access in an aircraft, such as an access panel, hatch, or door.

B

batch
A quantity of parts that were typically produced at the same time by using a controlled process and are typically received into inventory after inspection.

block time
The total amount of elapsed time in hours and minutes from the first movement of an aircraft from its parking position at the departure location until the wheels stop and all engines are shut down at the parking position in the destination location.

build item
A component in the model, such as a subassembly or system.

build position
A position within a model build hierarchy that a build item is associated with.

C

cannibalization
A process that uses a working component from an aircraft that is not in service and replaces a broken component on an aircraft that is in service.

CDL
See configuration deviation list.

check
A periodic inspection of an aircraft after a specified amount of time in service.

close time
The time that is required to close an access item.

compliance
> The state of being in accordance with regulated standards.

configuration
> A modification of an existing model, such as a new derivative of an existing engine.

configuration deviation list (CDL)
> A list of the non-structural external parts that can be missing from an aircraft without affecting airworthiness although a limitation might be associated with the CDL record.

consumable part
> A non-rotable inventory item that can be added to build positions in a model or to an aircraft or piece of equipment.

corrective action
> The steps that are taken to resolve a discrepancy and return an aircraft to service.

D

discrepancy record
> A record that tracks inconsistencies that affect the overall status of an aircraft.

E

effectivity
> An indication that a specified record applies to an aircraft component, for example, the effectivity of a service bulletin might be for all A320 aircraft.

exchange order
> A record that tracks the exchange of a piece of equipment.

F

fatigue rating
> A value that is based on a formula that is applied to calculate stress and load on physical materials.

fixed-frequency maintenance (PIP)
> See progressive inspection program.

flight log book
> A collection of flight data records that report aviation quality and maintenance for a specific aircraft.

flight log book setup record
> A record that configures the information that is shown in the flight log book and collects information that is required for a specific aircraft and regulations.

frequency iteration
> Repeated intervals of scheduled tasks or maintenance.

H

HIL See hold item list.

hold item list (HIL)
A list of specific work orders that are deferred because a required part, piece of equipment, or system is missing or inoperable although a limitation might be associated with the HIL record.

I

interval
The rate, or frequency, at which a maintenance event recurs. See also threshold.

J

job card
A detailed description of a maintenance task that is performed for a work order.

L

lease order
A record that tracks a piece of equipment that is leased, for a specified duration of time and cost, which is typically described in a contract.

loan order
A record that tracks a piece of equipment that is borrowed, typically for no charge, for a specified duration of time.

lot See batch.

M

maintenance significant item (MSI)
An item whose failure might have serious consequences for the safety and operation of the aircraft.

master task card
A record that is associated with a configuration-managed part and is used to describe a maintenance task, including the interval at which it occurs, and is also used to create task cards for specific aircraft and components.

MEL See minimum equipment list.

minimum equipment list (MEL)
A list of the systems and pieces of equipment that can be inoperable on an aircraft without affecting the airworthiness although a limitation might be associated with the MEL record.

mod See modification.

model The allowable configuration of an aircraft or piece of equipment that is used to validate the aircraft or piece of equipment.

modification (mod)
A change to the fit, form, or function of an aircraft or piece of equipment that is a critical element to manage engineering and maintenance tasks that are related to the aircraft throughout its service life.

MSI See maintenance significant item.

N

national requirement
A maintenance task that is required by a national airworthiness authority. See also vendor requirement.

new aircraft assembly
A virtual aircraft that is created to represent a corresponding model that is separate from operational aircraft until it is made active.

O

off-blocks
The time that the aircraft departed, or pushed back, from its parking position in the departure location.

on-blocks
Pertaining to the time that the aircraft arrived at its parking position in the destination location.

open time
The time that is required to open an access item.

operation
A maintenance activity that is defined to complete a task, which might consist of multiple operations.

organization
A record that identifies a unique legal entity. The data set for an organization includes information that companies or other distinct legal entities might share, such as calendars, vendors, and financial information. An organization can contain one or more sites. See also site.

P

part set
A group of parts, which are stocked in storerooms, that can be shared by organizations that are assigned to use the set.

phase A period of time that is used to plan, schedule, and perform maintenance tasks.

PIP

1. See progressive inspection program.
2. See fixed-frequency maintenance.

PO See purchase order.

progressive inspection program (PIP)
A maintenance program that is based on a fixed schedule and regulatory requirement.

purchase order (PO)
An authorized order to an external vendor or internal supplier.

R

repair order
A record that tracks the repair of a piece of equipment.

rotable

Equipment that is tracked in inventory and can be repeatedly maintained, repaired, or restored to a working and serviceable condition.

S

sampling program

A reliability program that requires a selected sample of aircraft, including the oldest and youngest aircraft in the fleet, to have maintenance tasks take place at a different threshold and frequency interval than the rest of the fleet.

scope of work (SOW)

A document or other mechanism that describes the agreed terms and deliverables, such as the aircraft or equipment and work activities that are due on specific dates, for a customer's service request.

service level agreement (SLA)

A contract between a customer and a service provider that specifies the expectations for the level of service with respect to availability, performance, and other measurable objectives.

site A work location, such as a plant or facility. See also organization.

SLA See service level agreement.

SLA breach

A violation of a commitment that is defined in a service level agreement (SLA).

slot A location that represents a maintenance area, such as an aircraft hangar, and a period of time in which maintenance activities are performed.

soft task

A task that can be completed during the next maintenance opportunity.

SOW See scope of work.

SSI See structural significant item.

statement of work

See scope of work.

structural damage and repair record

A record that is used to describe, review, and track all damage that occurs in the structure of an aircraft or a piece of equipment.

structural significant item (SSI)

Any detail, element, or assembly that contributes to carrying flight, ground, pressure, or control loads, and whose structural integrity is necessary for aircraft safety, for example, landing gear

subassembly

An assembled unit that is incorporated with other units into a complete assembly.

T

task See operation.

task card

A record that specifies maintenance tasks and generates work orders when the alert point of the task card is met.

technical publication

A record that maintains information that is related to an externally published directive or bulletin, such as an airworthiness directive or a customer service notification. Technical records are used in highly regulated industries to ensure that all regulations are properly implemented.

threshold

A specified limit that defines when a maintenance task must be performed. See also interval.

tolerance

A specified time period before or after a deadline during which tasks must be completed.

V

variant configuration

A high-level specification that is used by the manufacturer to describe the design and functional capabilities of an aircraft and that can be divided into subvariants to describe additional differences in tracked positions, allowable part numbers, and maintenance policy.

variation

See configuration.

vendor requirement

A maintenance task that is recommended by the vendor or by the original equipment manufacturer (OEM) of the aircraft or piece of equipment. See also national requirement.

W

warranty

Terms of a contract that outline standards for potential claims for an aircraft or piece of equipment.

work card

The detailed description of the maintenance task that is completed for a specific element of work and is associated with a work order.

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