



MAXIMO 7 TRAINING GUIDE

MAXIMO WORK MANAGEMENT AND LABOR REPORTING

MAXIMO WORK MANAGEMENT

MAXIMO™ 7 TRAINING CURRICULUM

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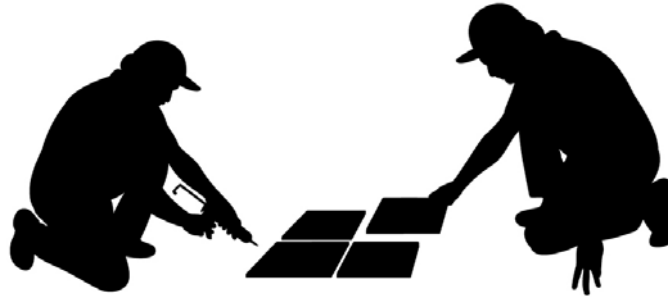
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WORK MANAGEMENT TRAINING OVERVIEW



Work Management is designed to cover all of the applications that would be necessary for maintenance/asset management professionals in their work roles. The applications covered include the MAXIMO 7 Environment, Navigation, Locations, Assets (aka Equipment), Work Orders (creation, planning and reporting of actual charges) and Failure Classifications. In addition, the Work Planning components are included which focuses on the roles of Maintenance Craft Leads, Planners and Supervisors. The content includes Job Plans, PM Records, Routes and Safety Plans. Inventory and Purchasing personnel would likewise benefit from the courses specifically designed for those materials management topics.

According to the principles of Total Productive Maintenance (TPM), the most critical element in accomplishing those goals is the **education, inclusion** and **responsibility** of all related parties: management, supervisors, planners, mechanics and data entry personnel. It is imperative that users are properly trained to make data entries that accurately and consistently represent the activities of the Organization. This data entered into MAXIMO 7 constitutes the source input for measuring maintenance success, as well as the source for establishment and evaluation of future policy improvement initiatives.

1 OBJECTIVES

Upon the successful completion of this course, the Maximo user will be able to:

1. Accurately and efficiently log into MAXIMO 7
2. Identify and Utilize Screen Form Conventions
3. Successfully navigate to any given Maximo Application or screen
4. Effectively query for Maximo Records

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5. Understand how to enter Asset and Location records and their relationship to the Drilldown (Hierarchy)
6. Within the confines of the Organization's Business Process understand how to create, route for approval and maintain a Maximo Work Order
7. Efficiently plan the usage of labor, materials and tool resources to build effective Work Plans
8. Apply Failure Codes and Remarks to Work Orders
9. Electronically enter the actual resource usage and costs against Work Orders their associated Locations, Assets and general ledger accounts
10. Create and modify Job Plans
11. Identify the relationship between Job Plans and the:
 - Scheduling of Labor Resources
 - Reorder of Planned Materials
 - Attachment of Safety Procedures

II. CHAPTER 2 – MAXIMO QUERIES

Searching for Records in the Maximo Applications



1 OBJECTIVES

Users should learn the process to search and retrieve data from the Maximo 7 database using the default query settings and to create custom queries through the employment of query operator tool set.

2 OUTLINE

2.1. INTRODUCTION TO SCREEN QUERIES

Screen queries enable the User to search the Maximo 7 database for selected records or record sets. Queries are built as Users enter known record information into selected fields on a designated Maximo 7 screen. Upon entry, each Maximo application opens on the List tab. Searches for records are made from this screen. If the User wishes to create a new record, they can click the **New Record** button on the toolbar which will transfer them into the application “data” page where they can complete the fields necessary to create a new record.

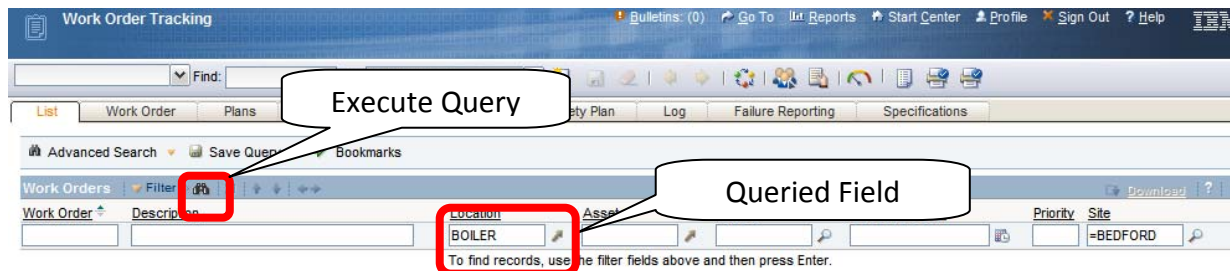
The primary query building process in Maximo 7 is intuitive and user-friendly. One of the significant value propositions of Maximo is to enable users to easily and quickly locate records. Record matching is “case insensitive” meaning that your search entry does not have to match

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the upper or lower case of the letter values in the database. In addition to the standard pre-built query structure, the program allows more advanced users to construct and save their own queries as SQL (Structured Query Language) commands, a resource that can be as robust and in some cases, a partial substitute for a low-end report writer.

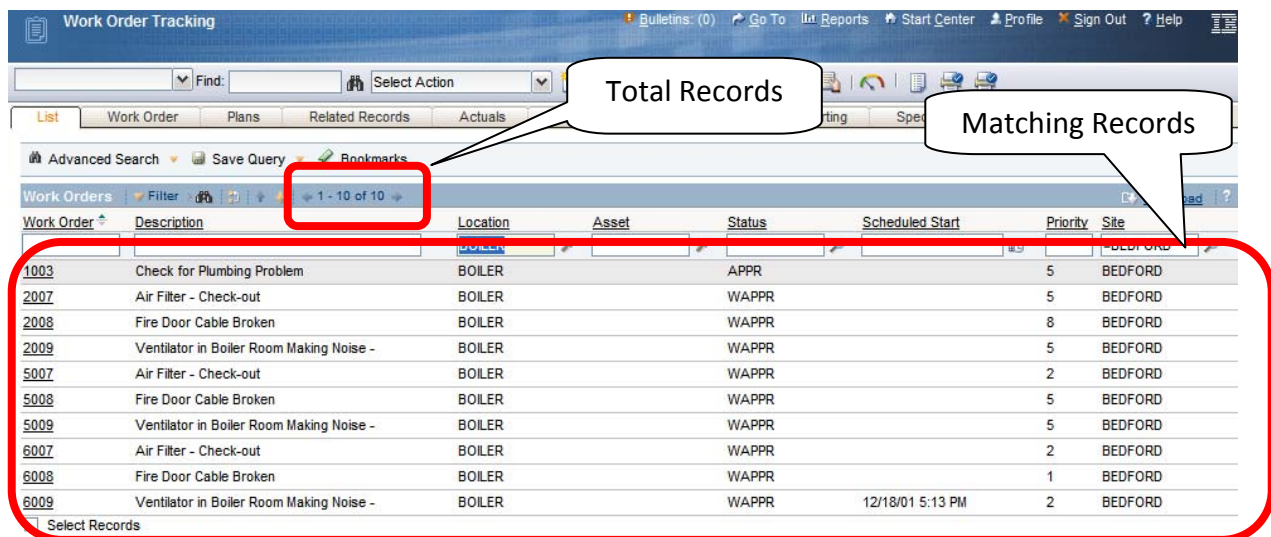
Standard Query Search - To locate a record or records in Maximo 7, the User should populate one or more fields with a known value or partial value (wildcard characters can be employed here). The system will then return a result set of records which match the User's input criteria.



For example, if users wish to find all Work Orders against a specific Location, from the List screen of the WO Tracking application, they would type or return a selected value in the Location field on the List tab. Then, after clicking the **ENTER** key or clicking the **binoculars icon** (located to the left and two rows above), a result set of all Work Orders for that Location will appear.

2.2. RESULT

Matching Record set Returned to Results screen



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The most commonly searched fields are included in the default List screen. However, in the case of Work Orders, the user may need to search against additional fields – not visible on the opening screen. Click the **Advanced Search** arrow and select **More Search Fields** from the menu list. This will open the More Search Fields dialog box, where most fields on the Main record screen are made available for data searches.

The Search screen form shown below can be modified to add additional fields for queries. Thus, if a field is searched to pull a list of records and is not visible in the default Maximo 7 screen, notify your administrator to request its inclusion in the search screen.

Advanced Search Options

Work Order Tracking

Find: []

Advanced Search Save Query Bookmarks

Work Orders More Search Fields

Work Order

1003
2007
2008
2009
5007
5008
5009
6007
6008
6009

Work Order []
Description []
Parent WO []
Location []
Search Location Hierarchy []
Asset []
Configuration Item []
PM []
Classification []

Problem Code []
Failure Class []
Service Group []
Service []
Vendor []
Originating Record []
Originating Record Class []

Work Type []
Class []
Site []
History? []
Priority []
Is Task? []

Plan Details

Job Plan [] Plan Craft []
Safety Plan [] Plan Materials []
Assigned Labor [] Plan Services []
Plan Tools []

Supervisor []

Lead []
Owner []
Owner Group []

Dates

Reported Date From [] To []
Target Start [] Target Finish []
Scheduled Start [] Scheduled Finish []

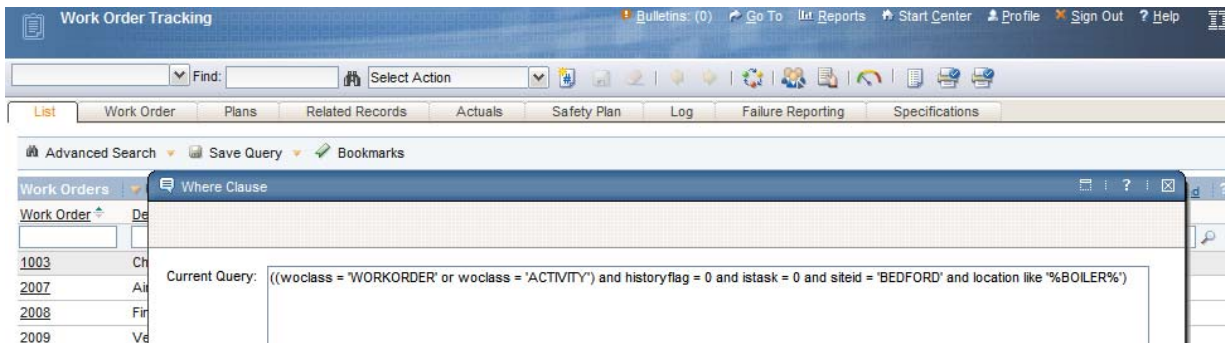
Find Clear Cancel

Automatic WO Default Criteria

By selecting **WHERE CLAUSE** from the Advanced Search Options arrow, users can view (and even edit) the SQL query that was built from the screen query. In addition to the search for Work Orders at *BOILER*, the default settings for the User's SITE and the 0 (meaning No) for both the history and *Is Task* fields appear in the text. These default entries will be explained later in the chapter.

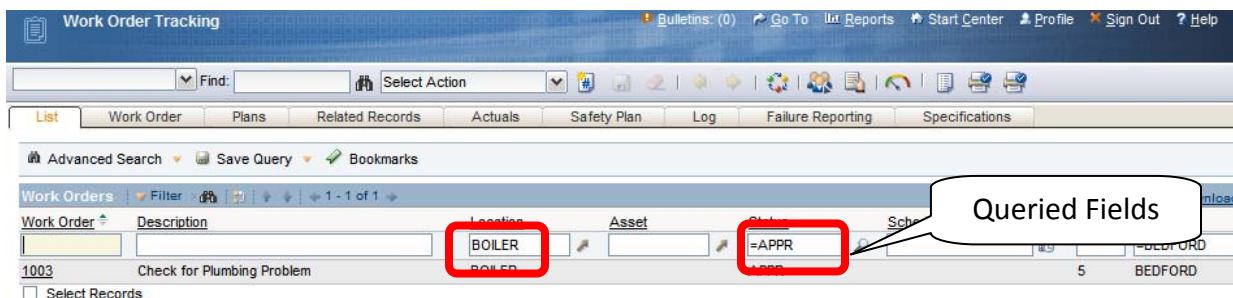
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2.3. SEARCHING FOR A RESULT SET USING MULTIPLE SEARCH FIELDS

To complete a multiple field query, the User populates two or more fields with data. The system will then return a result set containing those records for which **both** conditions are true. For example, you might want to find all *Waiting for Approval* Work Orders for Location *BOILER*. First, you would enter both known values in the respective fields to identify the records that you are trying to find. By populating multiple fields, the result set becomes smaller (more narrowly defined). Notice that in the illustration below, the value *=BOILER* is entered into the Location field and the value *=APPR* is entered into the Status field.



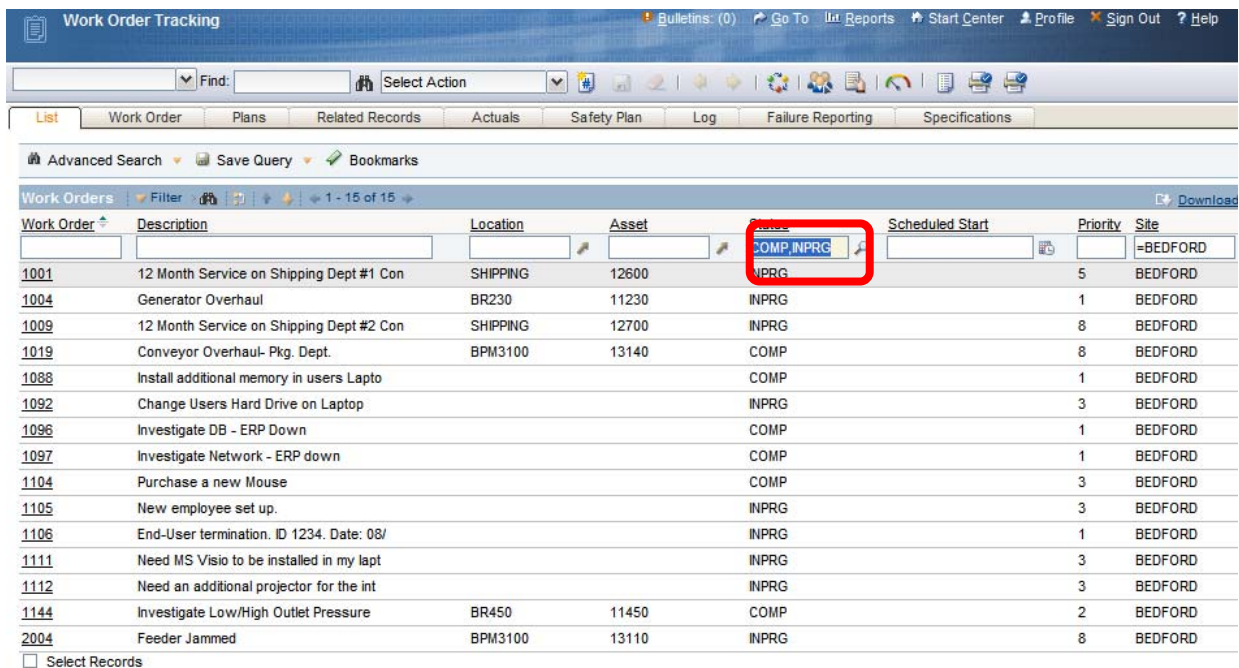
Notice in the result set above the number of matching records decreased to one record from ten in the original query (using only the location criteria). Users can search against as many fields as they choose and view the results of only those records that match all search criteria.

2.4. SEARCHING FOR A RESULT SET USING MULTIPLE VALUES IN THE SAME FIELD

OR CONDITION - Queries can be constructed to search for more than one value in the same field. In the example below, we are searching for Work Orders with a status of COMP (Complete) **or** INPRG (In Progress). A comma is used to separate values. In the result set, notice that Work Orders with either status are displayed.

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Work Order Tracking

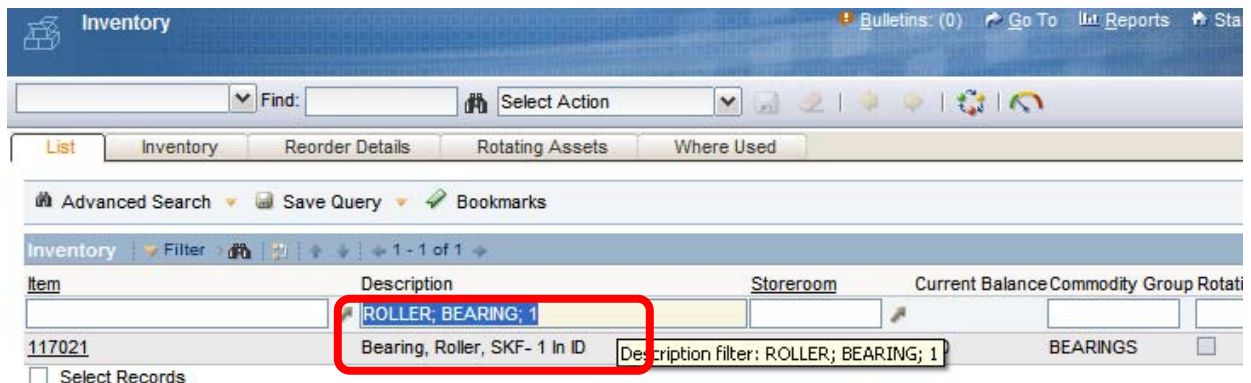
Find: [] Select Action []

Work Orders Filter 1 - 15 of 15

Work Order	Description	Location	Asset	Status	Scheduled Start	Priority	Site
1001	12 Month Service on Shipping Dept #1 Con	SHIPPING	12600	COMP, INPRG		5	BEDFORD
1004	Generator Overhaul	BR230	11230	INPRG		1	BEDFORD
1009	12 Month Service on Shipping Dept #2 Con	SHIPPING	12700	INPRG		8	BEDFORD
1019	Conveyor Overhaul- Pkg. Dept.	BPM3100	13140	COMP		8	BEDFORD
1088	Install additional memory in users Lapt			COMP		1	BEDFORD
1092	Change Users Hard Drive on Laptop			INPRG		3	BEDFORD
1096	Investigate DB - ERP Down			COMP		1	BEDFORD
1097	Investigate Network - ERP down			COMP		1	BEDFORD
1104	Purchase a new Mouse			COMP		3	BEDFORD
1105	New employee set up.			INPRG		3	BEDFORD
1106	End-User termination. ID 1234. Date: 08/			INPRG		1	BEDFORD
1111	Need MS Visio to be installed in my lapt			INPRG		3	BEDFORD
1112	Need an additional projector for the int			INPRG		3	BEDFORD
1144	Investigate Low/High Outlet Pressure	BR450	11450	COMP		2	BEDFORD
2004	Feeder Jammed	BPM3100	13110	INPRG		8	BEDFORD

Select Records

AND CONDITION - In certain instances, we may want to search for records that contain both values. For examples, searching for an Inventory record using a single word search might return hundreds or even thousands of matching records (words such as switches, bearings, fuses, motors, etc.). To obtain a manageable volume of results, use the & (ampersand character) to include two or more words that more narrowly define the matching records. Below, we have included the words "bearing" and "roller" along with a specification value "1" to match the diameter of the Part. Maximo 7 will return the result set for all records that include these three string texts regardless of the order that they appear in the field.



Inventory

Find: [] Select Action []

Inventory Filter 1 - 1 of 1

Item	Description	Storeroom	Current Balance	Commodity Group	Rotati
117021	Bearing, Roller, SKF- 1 in ID			BEARINGS	

Select Records

WILDCARDS -Users can type a value directly into a field on the Search screen that will match database records even when the entered value represents only a portion of the data. The functionality of Maximo 7 uses this (double wildcards %s) as the default operator format when information is queried from an alphanumeric field and no other wildcard operator is entered by

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the user. In early Maximo versions, text searches defaulted to exact matches (=). . Users then had to be trained to employ the wildcard character (%) to find records where there were multiple words in the field. Now the text string entered will match against both full and partial words. Your Administrator can change the global query default to an exact match setting. There is one exception to this rule, which relates to queries against the description fields within each application (located to the right of the key field on the top row). Thus, a search for *PIN* would not return records that had *SPINDLE* in the description field, but would consider *SPINDLE* as a match for fields other than the description field.

Users can also type an equal sign in front of the text to eliminate unwanted results. For example, when searching for Work Orders, a user that enters APPR in the status field will receive output for both WAPPR and APPR Work Orders (as APPR is part of WAPPR). Using the text =APPR will remove any Work Orders with a status of WAPPR. If an exact value is known, the use of an equal sign in front of the text (or a wildcard value after the text) will speed up the process time to return values from the query search.

3 OPERATORS AND WILDCARDS

To assist the user with query building, Maximo 7 allows the use of Operators (=, >, <), and Wild Cards (% , _). Understanding the use of these characters will substantially expand the query capabilities of the user.

_ - The underscore (Wild Card) character denotes an unidentified value containing a one character placeholder (i.e. – the query for 12_ - will return all values that fall between 120 and 129. The record containing 1200 would not be included because there are two characters after the 12.).

% - The percent sign (Wild Card) character allows the User to tell Maximo that the known information being input is only partial information for that field.

By placing the percent sign before the known information (**%12**), the user is telling Maximo that the known information resides at the end of the string.

If the % character placeholder is entered after the known information (**12%**), the user is telling Maximo that the known information resides at the beginning of the string.

If the % character placeholder exists both before and after the known information, the user is telling Maximo that the known information might be found anywhere in the string.

= - Placing the equal sign before the known information tells Maximo that the user is asking for only records that have an exact match in that field.

!= - Placing the exclamation point before the equals sign expresses that the user is asking for all records that **are not** exact matches in that field.

Placing the greater than sign before a numeric, date or alphanumeric value tells Maximo that the user is asking for all records that have a value greater than that entered into the selected field. There are a few tips to keep in mind, regarding sort order of values. Whenever using the

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>, < and between operators. Special characters are considered lower value than alphanumeric values. Numeric values are next. (Note: they sort correctly in “numeric only” fields, but are sorted as follows (from 1 to 1000) when the field they are in has a data type of alphanumeric (1, 10, 100, 1000, 11, 110, etc.) Finally, alpha values are last and they sort capitals first (A-Z) followed by lower case (a-z). By incorporating the equals sign (>=) the user is telling Maximo to also include records equal to the given information.

< - Placing the less than sign before a numeric or date value expresses that the user is asking for all records that have a value less than that entered into the selected field. By incorporating the equals sign (<=) the user is telling Maximo 7 to also include records equal to the given information.

Value1, Value2, Value3 – By placing multiple values in the same query field, the system will create a query searching for all records in which the values queried appear for that field. Example: (PM, EM, CM) in the Work Type field would have a result set equal to all records that were Preventive Maintenance, Emergency, or Corrective Work Orders. Do not put = in front of these multiple values in this case, as it will be evaluated as a single value and pull no records.

is null, is not null – Since blank fields cannot be compared (e.g. < ‘0’ or > ‘0’), it is necessary to use the following symbols to search for records that have blank fields or not blank fields. Example: If the user was searching for all Work Order records that have nothing in the Work Type field, the user could populate the Work Order Type field on the Find tab with ~NULL~. If the user wanted to search for all Work Orders that **did** have a populated Work Type, then the query would be !=~NULL~). Null searches cannot be made against text search fields (description fields).

4 BUILDING QUERIES

To quickly retrieve a small set of matching records, users should enter all known information/operators should be entered into the appropriate fields.

From our earlier search for Work Orders is the BOILER room location we noted that some defaults had been placed into the fields that are visible in the More Search Fields window. In Work Order applications, the **History?** field differentiates between Current and History Work Orders. History Work Orders are defined as those Work Orders with a Status of *Close* (Closed) or *Cancel* (Cancelled). The purpose of this division was to allow users to query against only active records, without including in the result set, numerous records that had been cancelled or completed from much earlier time periods. All Statuses other than *Cancel* and *Close* represent Current Work Orders (History? Field = *N*). When accessing the Work Order application Search screens, the History field automatically defaults to *N*. If the field is left blank, the user can search both History and Current Work Orders.

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The screenshot shows the 'Work Order Tracking' application window. On the left is a list of work order numbers (1003, 2007, 2008, 2009, 5007, 5008, 5009, 6007, 6008, 6009). The main area contains a search form with fields for Work Order, Problem Code, Work Type, Description, Failure Class, Status, Parent WFO, Location, Class (set to WORKORDER), Search Location Hierarchy, Asset, Originating Record, Configuration Item, Originating Record Class, PM, and Classification. Below these are sections for Plan Details (Job Plan, Plan Craft, Reported By, Lead, Safety Plan, Plan Materials, On Behalf Of, Owner, Assigned Labor, Plan Services, Supervisor, Owner Group, Plan Tools) and Dates (Reported Date, Target Start, Target Finish, Scheduled Finish). At the bottom right, the 'Find' button is highlighted with a red box. Three callout boxes point to specific fields: 'History? Field' points to the 'History?' field (set to N), 'Is Task? Field' points to the 'Task?' field (set to N), and 'Find Button' points to the 'Find' button.

The Site field identifies the Site to which the Work Order belongs. The Class field defaults to values WORKORDER and ACTIVITY. This eliminates the CHANGE and RELEASE optional values that are used with the Service Desk application functionality (see Chapter VII) and share the Work Order table. As the Maximo product migrated to its current version, all Work Order tasks were given a Work Order number. Tasks are differentiated in the database from “true” Work Orders by the *Is Task?* field, which is set to Y for tasks and to N for true Work Orders. Therefore, when entering the Work Order Search screens, the *Is Task?* field automatically populates with an N to remove job tasks from the result set of available Work Orders. Using the Is Task? And History filter also enhances the performance of the system in processing query requests.

Once the parameters for the query have been entered, the User must click on the **FIND** button (or binoculars) or they can use the **ENTER** key to initiate the search. Maximo 7 will then automatically open the results sub tab and display all records that meet the query.

5 SELECTING A SINGLE RECORD

When selecting a single record from the Results sub tab, the User may click on the underlined record number in the left column to populate that record’s information on the main screen of

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the respective Application. To modify the record selected or to change the underlying query, return by clicking on the **List** tab.

6 BROWSING RECORD SETS

All records in the Query Results may be brought over to the main screen, for review, by simply clicking on the **Work Order** tab while on the List tab. This allows the User to browse through all of the result set records, using the **Next** and **Previous** Record buttons (left and right arrow on the toolbar).

The User can also bring over only selected records from the Query Results. After clicking the **Select Records** box (bottom right of the result set), check boxes will appear by each listed record. Users can check blocks beside the desired records refining the record set. Click on the application's main screen to review each record.

Work Order Tracking

Find: [] Select Action []

Work Orders Filter [] 1 - 10 of 10

Work Order	Description	Location	Asset	Status	Scheduled Start	Priority	Site
1003	Check for Plumbing Problem	BOILER		APPR		5	BEDFORD
2007	Air Filter - Check-out	BOILER		WAPPR		5	BEDFORD
2008	Fire Door Cable Broken	BOILER		WAPPR		8	BEDFORD
2009	Ventilator in Boiler Room Making Noise -	BOILER		WAPPR		5	BEDFORD
5007	Air Filter - Check-out	BOILER		WAPPR		2	BEDFORD
5008	Fire Door Cable Broken	BOILER		WAPPR		5	BEDFORD
5009	Ventilator in Boiler Room Making Noise -	BOILER		WAPPR		5	BEDFORD
6007	Air Filter - Check-out	BOILER		WAPPR		2	BEDFORD
6008	Fire Door Cable Broken	BOILER		WAPPR		1	BEDFORD
6009	Ventilator in Boiler Room Making Noise -	BOILER		WAPPR	12/18/01 5:13 PM	2	BEDFORD

Select Records Button

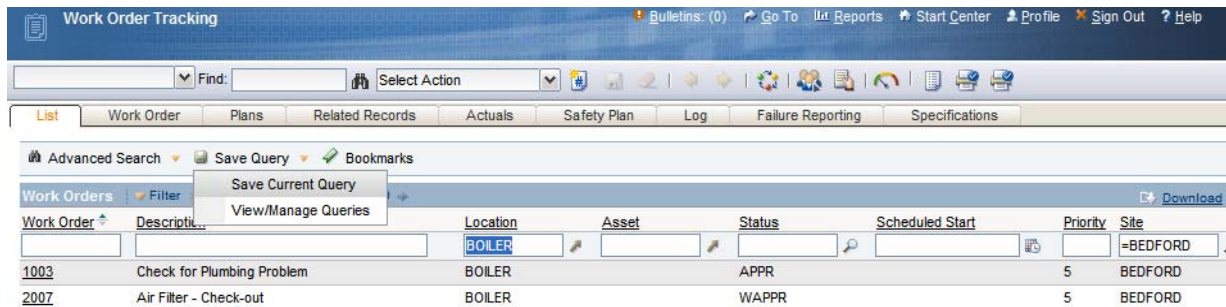
7 SAVING QUERIES

Maximo allows the User to save queries, either for their own use only, or to share the saved queries with all Maximo Users in that application.

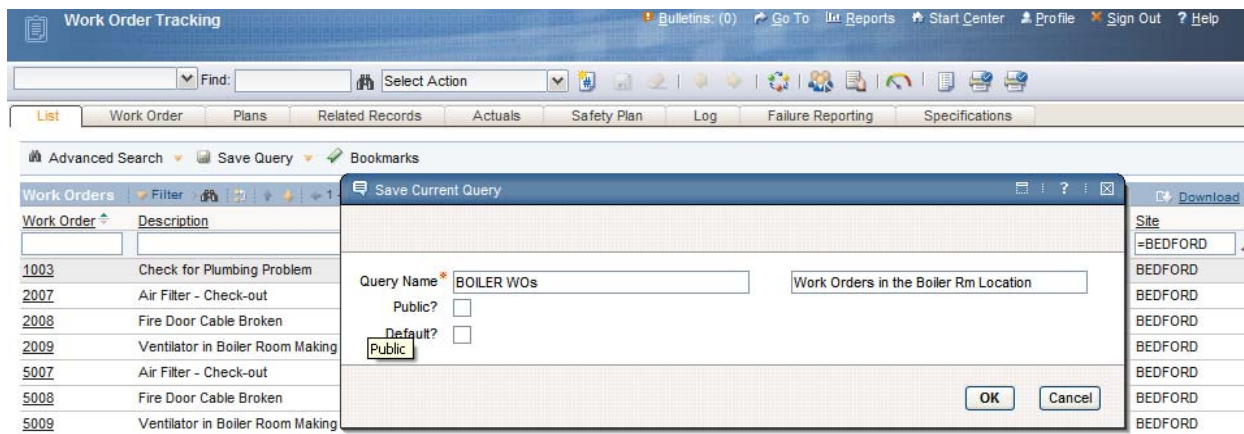
Once a query has been created and the User has determined that they would like to save that Query, (from the List tab) the user must next go to **Save Current Query** option under the Save Query Options drop down.

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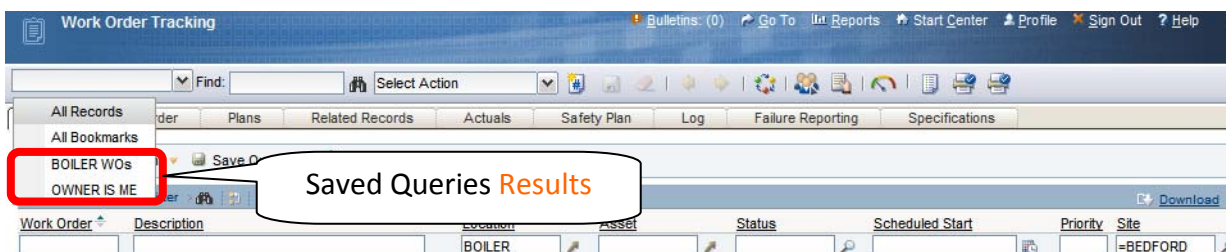
A file name is required to save the query and an accurate brief description should be provided for the query in the next field, especially if other Users will have access to this query.



By clicking **Public**, this query can be shared with other Users. When doing this, all other Users will be able to see, run, and even set the query as their default screen setting within that application.

The User also has the ability to set the query as their default query. In doing so, this query will run automatically whenever Users log into the application and Users will be transferred directly to the Results sub tab of that application.

Saved queries (and bookmarks) can be retrieved at any time by clicking the drop down arrow at the top left of the application screen.

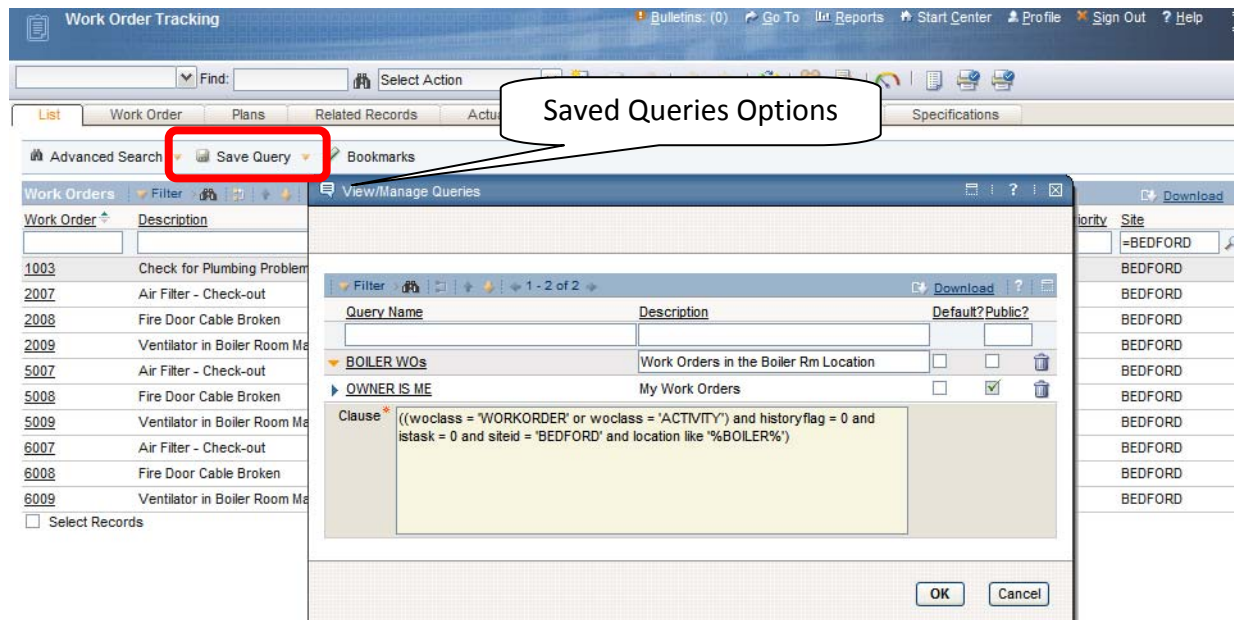


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All User Saved and Public Queries can be managed from the **View/Manage Queries** option on the same drop down menu. The SQL text can be edited and queries can be deleted by their owner. Note that queries are only accessible from the specific application (screen) in which they were built. In other words, Users cannot access Asset stored queries from the Work Order applications (screens). Users must first enter the Assets application to retrieve stored queries for that application.

When making changes to a Saved Query, the User must first select the record to edit. Only the author of the query is authorized to edit or delete the query. Once the Record has been edited, the User must then click on the **OK** button, to complete the Save process.



8 ADVANCED OPTIONS

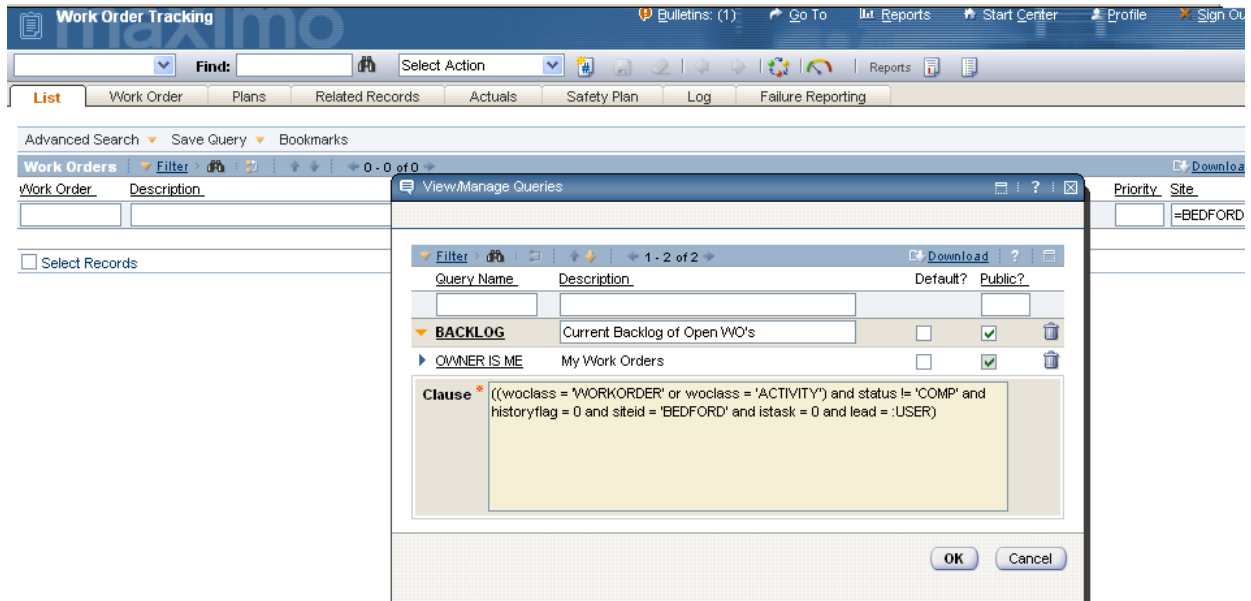
Follow the Save Query process as described in the previous section, but click the **Public** checkbox so that the query will be usable by all. After saving the query, go to the Save Query dropdown and select **View Manage Queries**. Find the text that includes your labor id (lead='WILSON'). Replace 'WILSON' with :USER. Do not add the single quotes back in as :USER is a system variable. Click the **OK** button and the text modification will be saved. Now all Users can select this saved query from the list when configuring their dashboard.

The system variable SYSDATE is also a valuable tool, since it allows you to deploy a floating date range. For example, show me all the Work Orders that have been completed in the last seven days. After creating the query on the Maximo screens go to **View/Manage Queries** and add a condition *AND STATUSDATE BETWEEN SYSDATE-7 AND SYSDATE*. Whenever the stored query is executed, the current date is substituted for SYSDATE. If your database is SQL Server, rather than Oracle the variable for the current day is *getdate()*. When you want to add or subtract

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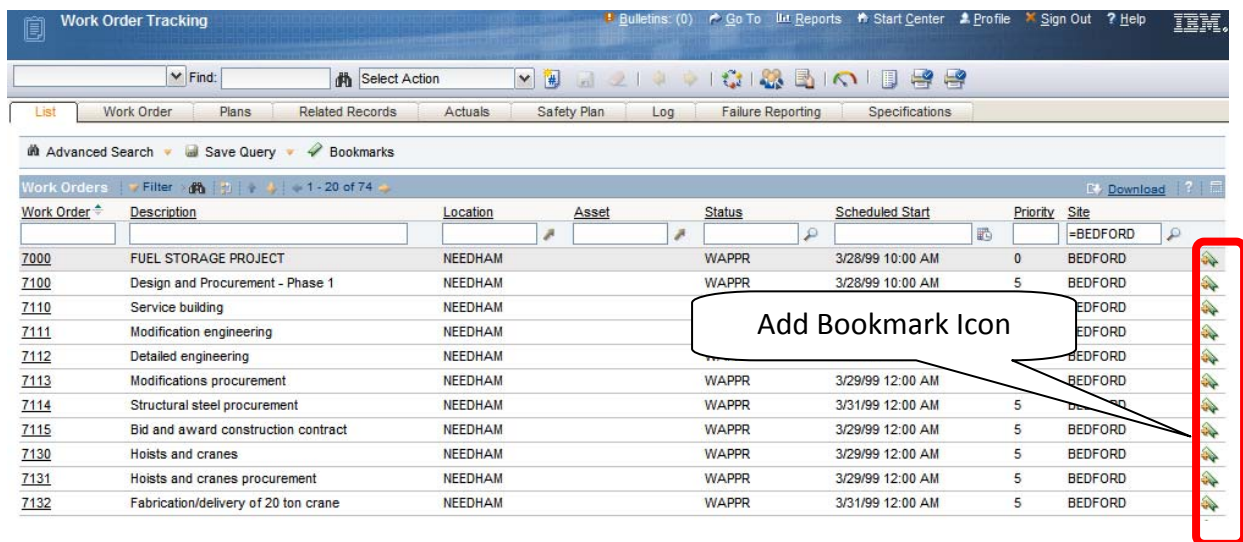
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days (using SQL Server) place the operator (+/-) and value after the parentheses - not inside them.



9 BOOKMARKS

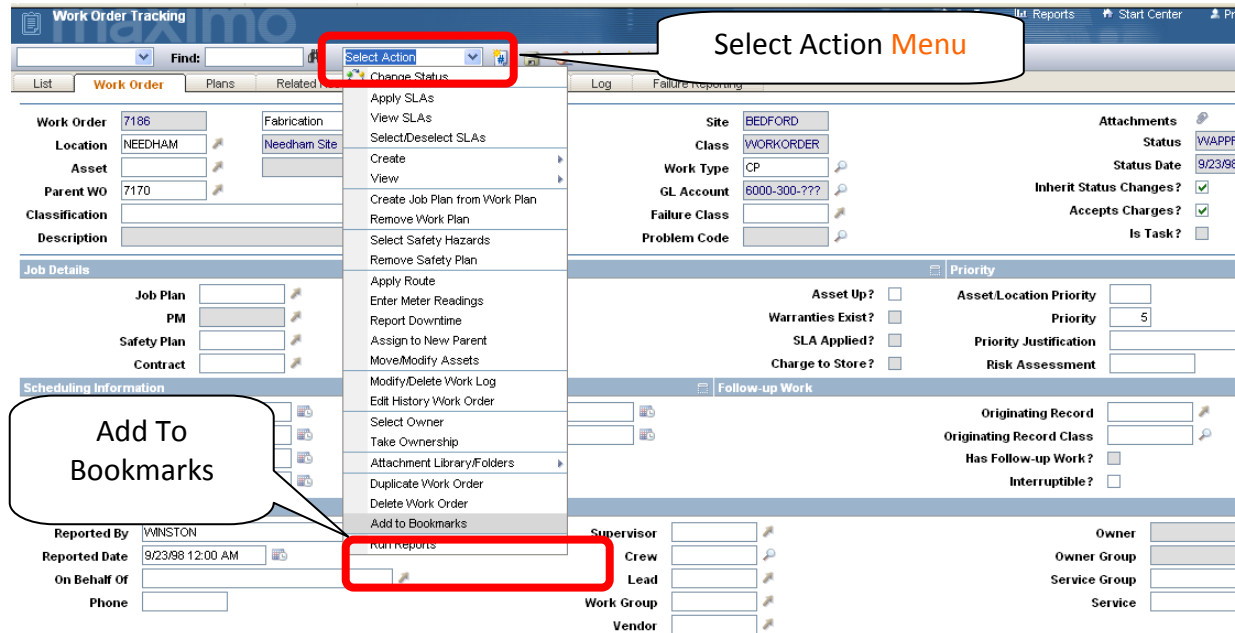
This feature allows the user to save individual records under a single sub tab for quick reference access (e.g. a list of project Work Orders, active Locations, or Assets that the User routinely works on).



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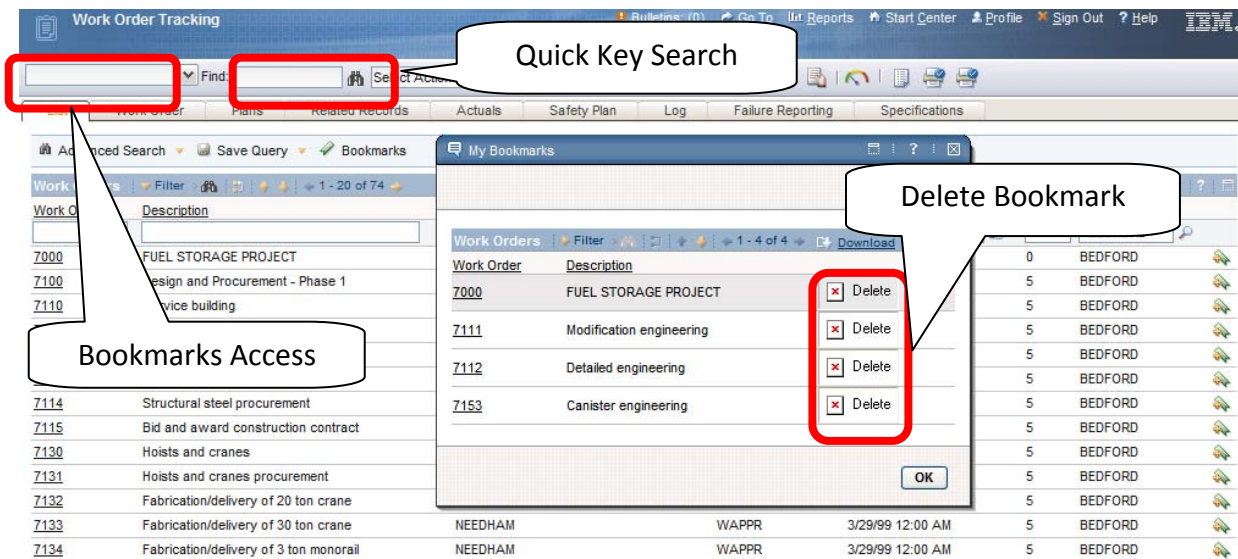
In the example above, a search was made for Work Orders with a work type of CP (Capital Projects). Project Work Orders assigned to us were bookmarked for easy future reference. The user can Bookmark a record by either clicking on the **Bookmark** icon located on the Results sub tab or by choosing to Bookmark a record from an application's main screen using the **Select Actions** menu.



After bookmarking a record, the User can find all Bookmarked records under the drop down menu item where we accessed Saved Queries. Records can also be viewed by clicking **Bookmarks** just above the Result Set window. The bookmark list will appear in a dialog box, where they can be selected or deleted as bookmarks.

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10 QUICK KEY SEARCH

This selection will return a record where the key field of that record (i.e. Work Order Number, Asset Number) is equal to the User input. This method is quicker than conducting a query from the Search screens, but can only be used when the user knows the exact record number (key field value). Wildcard searches are not allowed. To initiate this action, a User **does not** need to select the option from the pull down menu. Users place the data into the *Find* field and click on the **Binoculars icon** or **ENTER** key, returning the record to the application screen for viewing.

11 REVIEW QUESTIONS

Using the Work Order Tracking application, find all Work Orders that are currently in progress (status='INPRG'). How many records are there?

Pull up any Asset record in the Asset application and locate the manufacturer field. Query to find all other records which have the same manufacturer.

You can only read the numbers the first three numbers of the serial numbers (233) on an old generator. How would you find all the Asset record numbers that match those two conditions? How would the query change if you were not sure whether 233 were the first three digits?

Find all Work Order records that have been created during the past 90 days. Which application would you run the query from? What fields need to be populated to complete the query? How many records are there?

III. CHAPTER 3 - JOB PLANS

Creating Job Plans *Defining Labor and Material Resources*



1 OBJECTIVE

Given the MAXIMO 7 platform, users will learn to create and modify Job Plan records, thus establishing consistent maintenance procedures compliant with the manufacturers' requirements. Users will learn the relationship between Job Plans and the a) Scheduling of Labor Resources, b) Reorder of Planned Materials, and c) Attachment of Safety Procedures. Users will create and duplicate a Job Plan record for association with a PM record and the MAXIMO PM sequencing format.

2 OUTLINE

2.1. INTRODUCTION

The concept of Job Plans is identical to the Work Plans concept that was described in the Work Order and Job Plan sections of the MAXIMO 7 Power User course. The only significant difference is that Job Plans can serve as templates for future work activities that will be used repetitively in the future. Work Plans are designed to only serve the specific Work Order for which they are built, but MAXIMO has added a feature where a Work Plan can be converted into a Job Plan under the Work Order Tracking **Select Action** options.

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Job Plans have statuses now and newly created Job Plans are created with an initial status of *DRAFT*. The status will need to be changed to the *Active* status before it can be used on a Work Order or used in association with a Preventive Maintenance record.

A Job Plan may be used innumerable times, simply by entering the Job Plan number in the *Job Plan* field of Work Order Tracking main screen, or through the association with a Preventive Maintenance record which will generate periodic Work Orders. It is easy to understand the time-saving value of the Job Plan function, since without Job Plan templates, users would have to manually enter the operating steps, planned labor, and material resources each time a PM work order was generated.

Job Plans have seven basic components:

- Operating Steps (Tasks)
- Planned Labor
- Planned Materials
- Planned Services
- Planned Tools
- Work Assets
- Specifications

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3 CREATING JOB PLANS

3.1. CREATING JOB PLAN RECORDS

To create a new record (for the Job Plan application, or any other application):

- Step 1 – Navigate to the Job Plan application where the Record will be Created.
- Step 2 – From the List Screen, click the **New Job Plan Button**
- Step 3 – In the top sections, enter a value for the JP record number and all other required fields. Required fields are designated with a red asterisk (*) next to the field label. Values entered into this section are copied as values for entry into the corresponding Work Order fields whenever a Work Order utilizes this Job Plan.
- Step 4 – Save the record by clicking the **diskette icon** on the toolbar.

3.2. PRIMARY JOB PLAN FIELDS

1. **Job Plan:** Key field to identify the Job Plan. Since this procedure might be used for multiple assets, any intelligent numbering should reference the procedure only and not the specific asset to which it is applied.
2. **Description:** Describes the procedure and/or the object to be serviced. A long description field accompanies each description field, so that longer and more specific instruction details can be accommodated. When this field is populated, the **page icon** will change to an orange color.

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3. **Organization/Site:** If the Job Plan is limited to a specific Organization or Site, enter the value in these fields. If blank, the Job Plan applies to all Sites.
4. **Status:** With MAXIMO 7, a status field was added to the Job Plan records. Newly created Job Plans begin with a status of *DRAFT*. Such records cannot be associated with Work Orders, PM or Route records. Changing the status to *ACTIVE* makes the record usable in these applications. There is also a status of *INACTIVE* which, as *DRAFT*, blocks the functionality within other applications.
5. **Template Type:** This new field to MAXIMO 7 allows users to create a division for Job Plan types, which will help support queries and Conditional Security (limited views).
6. **WO Priority:** The Priority that will accompany all Work Orders using this procedure.
7. **Supervisor:** The Supervisor responsibility which will transfer into the Work Order using this Job Plan.
8. **Duration:** Total length of time necessary to complete the task. When populating this field, include the total time to complete the process, including any time gaps between tasks. This number may be less than the aggregate Labor hours worked, if multiple workers can be engaged simultaneously. The duration estimate is copied into the Work Order and used for scheduling purposes, such as determining whether the task can be completed within the remaining work hour window for that day.
9. **Lead:** The designated person for assignment purposes.
10. **Work Group:** The designated Person Group responsible for Work activities using this Job Plan.
11. **Owner/Owner Group:** MAXIMO 7 supports the association of either an Owner or an Owner Group value at the Task level. These fields can be accessed by clicking the column details button to expand the view of all fields associated with the task step.
12. **Classifications:** Classifications are now available for use with Job Plans. Populate the classification field with a value from the select list. The supporting text description will appear in the field immediately below.
13. **Interruptible:** An optional field to identify whether the tasks must be completed in a single setting, or whether the procedure can be started and stopped. This field is primarily used to conduct labor resource balancing in conjunction with project scheduling software.

3.3. ADDING JOB PLAN TASKS

To add tasks to the job plan, use the following steps:

- Click the **New Row button** in the Job Plan Tasks section
- Enter a number in the Task ID field, or accept the default number
- Enter a description of the task in the Description field
- Enter a sequence number and estimated time for completion, if needed
- Repeat steps a-e until all tasks have been added to the Job Plan record
- Click the **SAVE icon** (diskette)

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3.4. JOB TASK FIELDS

1. **Task ID:** This numerical field is a required, non-editable field in the upper portion (Operating Steps) of the Job Plan screen. When creating Job Plans, it is advisable to leave a gap in the numbering sequence, to allow for steps to be added later, as well as steps from an annual procedure that fall between the operating steps of a quarterly procedure. The tasks will reorder upon saving the record based upon the *Task ID field* values. The default interval is 10, but this can be edited under *Work Order Options*.
2. **Operating Step Description:** Operating steps describe the procedural tasks that need to be completed for this Job Plan. Long description fields can be populated and accessed to support the longer text often required by procedural steps.
3. **Hours:** As a rule, the entry of time required for each step of a Job Plan is not valuable input, as the actual time worked is only recorded on a total (not step) basis. The most prominent exception to this rule would be the use of multi-craft Project Work Orders.

3.5. JOB PLAN ESTIMATES

Steps to Add Job Plan Estimates:

1. Click the **New Row button** on the sub-page tab
2. Enter a task ID in the Task ID field if the labor selected is to perform a specific task on the job plan – otherwise, leave the field blank
3. Select the appropriate resource code (must be an active record in the Labor, Inventory, Service or Tools applications)
4. Optionally, enter or modify the estimated time in hours for Labor or quantity for Materials, Services and Tools to complete the task line
5. Repeat steps a-e until all resources have been added to the Job Plan
6. Click the **SAVE icon**

4 JOB PLAN ASSETS

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Location	Asset	Item	Asset/Location/Item Description	Safety Plan	Default Safety Plan?
	11430		Centrifugal Pump 100GPM/60FT HD	SPLAN2	<input checked="" type="checkbox"/>
		PUMP100	Centrifugal Pump 100 GPM, 60 FT-HD		<input checked="" type="checkbox"/>

Locations and Assets can be registered to a Job Plan on the Work Assets tab, thereby associating them with a job procedure and optionally, a safety procedure, with those Asset and Location records. For each unique combination of Job Plan/Asset or Job Plan/Location, a unique Safety Plan can be specified. Also, when using the **Select Value** option from the Job Plans field in the Work Order Tracking application, the select value list will default to only those relationships previously defined in the Job Plans Work Assets screen as shown below. (Note: Users can expand the view to all available Job Plans by deselecting the **Show Only Job Plans Associated with Current Work Assets** option.)

Job Plan	Description	Template Type	Organization	Site
P11430A	Centrifugal Pump Service- 3 Month	MAINTENANC	EAGLENA	BEDFORD
POUTPR	Investigate Low/High Outlet Pressure	MAINTENANC		

If the Safety Plan is applied directly to the Location or Asset record (through the Safety Plans tab within those applications), the Safety Plan value will not be automatically transferred into the Safety Plan field on the Work Order, solely from its prior association with an Asset or Location record. This auto population of the Safety Plan into the Work Order record will only happen when the combination of Job Plan and Asset/Location is referenced on the Work Assets tab (as shown above).

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The theory behind requiring the combination of Asset or Location and the associated Job Plan was to accommodate those Asset and Location records that might have multiple (and unique) Safety Plans, based upon the Job Plan tasks specified. For example, for a single Asset, one Job Plan might require an Electrical Safety Procedure while another maintenance procedure on the same Asset might possess a different Safety Hazard, possible Fire Hazard or the presence of Hazardous Materials.

5 NESTED JOB PLANS

One of the enhancements to MAXIMO 7 is the inclusion of “nested job plans”. In the example below, Task 10 is to check the electrical subsystems and components. Rather than list each individual task in the job plan below, a job plan for inspecting an electrical panel (JP11220) is nested into Task 10.

The screenshot displays the MAXIMO Job Plans interface. At the top, there's a navigation bar with 'Job Plans' and various utility links. Below this is a search bar and a toolbar. The main content area is divided into sections: 'Details' and 'Job Plan Tasks'.

Details Section:

- Status: ACTIVE
- Template Type: Maintenance
- Duration: 2:30
- Classification: (empty)
- Class Description: (empty)
- Launch Entry Name: (empty)
- Default WO Class: (empty)
- WO Priority: 9
- Interruptible?: ☐
- Flow Controlled?: ☐
- Suspend Flow Control?: ☐
- Flow Action: (empty)
- Flow Action Assist?: ☐
- Supervisor: MILLER
- Crew: (empty)
- Lead: KAZMIER
- Work Group: (empty)
- Owner: (empty)
- Owner Group: (empty)

Job Plan Tasks Section:

Sequence	Task	Description	Nested Job Plan	Duration	Meter
10	Check Electrical Subsystems and components		JP11220	0:00	
20	Check Motor and Mounts			0:00	
30	Check Filtration Units			0:00	
40	Conduct Air Quality Chemical Tests			0:00	

Planned Labor Section:

Task	Craft	Skill Level	Labor	Quantity	Hours	Rate	Line Cost
	MECH	FIRSTCLASS		1	3:00	25.00	75.00
	ELECT	FIRSTCLASS		1	1:30	22.00	33.00

When this job plan is attached to a Work Order the task steps 10 through 50 will be included on the primary Work Order. A child Work Order (1176) will be created which contains the task steps for the electrical panel inspection.

1. Nested job plans saves time as the components can be reused inside of several different Job Plan records. Additionally, time is saved when data loading Job Plans for assets that may come from multiple vendors. For example, your Organization may have a certain set of procedural steps required for the installation (or ongoing maintenance) of pumps.

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However, certain pump brands may require a few additional unique steps to properly install (service) and maintain the warranty of that asset.

5.1. UNDERSTANDING FLOW CONTROL

Flow control is a pre-built workflow process using the standard Maximo Task and Work Order functionality. Flow control automatically changes the status of a task to *INPRG*, whenever its predecessor field(s) changes status to *COMP*. This functionality is particularly useful in conjunction with Maximo Workflow, so that new assignments could be made to initiate work on a new Task when the prior Task had been completed. Users can also set the predecessors for a Task (in the Job Plan application), so that three or four Tasks might be able to initiate simultaneously, but others only after the completion of specific other Task steps. Users populate one or more predecessor Tasks by clicking the arrow next to that field which appears under the Detail section of each Task. After clicking the arrow, a dialog box will appear showing all Tasks, and users can select the checkboxes to define which steps must be completed prior to the auto-initiation of that Task. Users must define the Predecessors values individually for each Task in the Work Order.

Flow Control also prohibits users from manually changing the status of the Work Order to *COMP*, but will automatically do so when all Tasks have reached a status of *COMP*. Again, this supports a Workflow action that might fire an inspection assignment, or make other changes to record values using the Flow Action field to call an Action in Maximo. For example, the value in the Lead field might be modified to another person once the Work Order is complete, or the status of the Work Order might be modified.

5.2. ASSOCIATING LINKED DOCUMENTS WITH JOB PLANS AND PM RECORDS

When Asset and Location records are newly acquired and entered into MAXIMO 7, the proper PM Programs and Job Plans for the newly acquired assets should be entered into MAXIMO 7, including a review and the entry of Operations and Maintenance (O&M) documentation from the manufacturer for convenient storage retrieval. Documents that would assist the technician, such as exploded parts diagrams, detailed operating steps, and safety information can be scanned and registered in the Linked Documents tab of most applications. Those documents can then be retrieved for the Job Plan record or from the Job Plan folder (in Linked Documents) for any Work Order record using that Job Plan procedure (as illustrated from a Work Order record below). Linked documents can be assigned at the Task or record level in MAXIMO 7. If O&M documentation or other information resources are not available, the Vendor can be contacted by phone or by the Internet to obtain correct maintenance procedures for the Asset in question.

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6 REVIEW QUESTIONS

1. Create a Job Plan of your own choosing. Select a Job Plan that will serve as a quarterly PM procedure for either an Asset or a Location. After entering the record number and description for the Job Plan, Include at least three operating steps, with labor and part estimates to complete the task. (Make a note of your Job Plan number, as we will use your Job Plan later in the Review Questions section of Chapter 2 – Preventive Maintenance.)
2. Duplicate the Job Plan that you just created (under Select Actions drop down list) and adjust it to serve as the annual PM procedure, adding any additional operating steps, labor, and parts requirements and modifying the Job Plan record number (required) and description and duration, as necessary. Save the duplicated record. (Note: Delete any Operating Steps that are invalidated by the annual procedure. For example, an inspection step within the quarterly PM would be eliminated from the annual PM procedure, if the annual included a step to replace the part to be inspected.)
3. Control Flow example: Create a new job plan with five task steps. Check the Flow Controlled checkbox. On task steps 10 and 50, leave the *Predecessors* field blank. For task 20, click the arrow next to the *Predecessors* field and select task 10. For steps 30 and 40, add steps 10 and 20 to the *Predecessors* field as above. Make note of your Job Plan name. Save and change the status of the new Job Plan to active. Create a new Work Order in the WO Tracking application, and add the newly created Job Plan number into the Job Plan field in the main Work Order Tracking screen. Save the Work Order and change the Work Order status to *INPRG*. Check the Plans or Actuals tab to see which task steps changed from *WAPPR*. Change the status for task step 10 to *COMP*. Review the statuses for all task steps in the table window. Finally, change the status for step 20 to *COMP*. Now, which steps changed to *INRG*?

IV. CHAPTER 4 - PREVENTIVE MAINTENANCE

PM Setup and Generation Parameters



1 OBJECTIVES

Given the MAXIMO 7 platform, users will learn to create Preventive Maintenance records, thus establishing periodic maintenance procedures for both Assets and Locations. Users will also learn to properly associate and schedule a Preventive Maintenance record with a Location or Asset record using both calendar-based and meter driven interval calculations.

2 OUTLINE

2.1. INTRODUCTION

The starting point for an effective Preventive Maintenance (PM) program is the identification and registration of maintainable assets. As mentioned earlier, it is important to identify and load all Asset and Locations into the MAXIMO 7 database that will require periodic maintenance to maximize performance of those assets, and avoid their premature failure. It is also important to exclude from the PM program those objects for which the maintenance costs would exceed the value of replacing the object (commonly referred to as “run to failure” assets). For example, one could load bathroom exhaust fans into the database as Assets and then create a maintenance program to check to lubricate them annually. However, a review of labor cost to accomplish this PM activity would likely indicate that the PM cost would significantly exceed the cost of the exhaust fan itself, particularly when considering that the fan would likely run for several years without maintenance. Another reason to eliminate such “run

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to failure” assets” is to reduce the work requirements on the labor force to avoid diluting the work efforts on more critical assets.

The PM program is necessary to extend as long as possible the useful life of your Organization Assets. While each industry is different, maintenance studies have indicated that the useful life of equipment is extended by an average of 40% when properly maintained as compared to those assets that are only minimally serviced. The value received for Assets that are well-maintained is another consideration. As we would want to buy only used vehicles that had complete and fully documented maintenance records, Organizations should require the same documentation for their expensive capital assets, in the event that they might be offered for sale.

Also, the cost of PM activity represents only a small fraction of the cost and effort to complete Corrective and Emergency work (industry studies indicate a ratio of 1 to 4), not to mention the loss of that Asset’s functionality (and any related output) while awaiting repair. Industry studies have shown that an increase in PM activities will reduce the cost and hours required for Breakdown Work and the level of Corrective and Emergency work will begin to decline significantly in as little as three to six months after the increase of PM activity.

3 SCHEDULING PM WORK

Preventive Maintenance on most Assets is generally scheduled on a calendar or date driven basis, daily, weekly, monthly, quarterly, or annually. For other Assets, predictive maintenance may be a more efficient method of determining failure probability and you may wish to base the maintenance schedule upon a usage function, such as the increase in a meter reading, or some other non-calendar driven parameter. MAXIMO 7 supports either (or both) methods of triggering Preventive Maintenance Work Orders. As an example of dual triggers, an automobile requires an oil change every three months or 3000 miles, whichever comes first.

Upon the generation of PM Work Orders, the system will evaluate each PM record (the vehicle PM in this example) to determine whether the date driven parameter has been exceeded. If it has, a new Work Order is generated for the vehicle. If not, the system will then evaluate the mileage delta (increase from the odometer reading at the last maintenance date). If the new mileage reading is showing 3000 miles more than the reading at the last preformed maintenance, then a Work Order will be generated. Whenever a Work Order is generated for a dual parameter record, both the next scheduled due date and meter reading interval are advanced simultaneously (by three months and 3000 miles). This prevents a mileage driven PM from being generated one week due to miles driven and the following week by the calendar driven PM parameter.

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Preventive Maintenance

Find: [] Select Action [] [] [] [] [] [] [] [] Reports

List PM Frequency Seasonal Dates Job Plan Sequence PM Hierarchy

PM FL601995 NAVSTAR PMA Site FLEET Status DRAFT

Work Order Generation Information

Use Last WO's Start Information to Calculate Next Due Frequency? ☒ Generate WO Based on Meter Reading (Do Not Estimate)? ☐
Generate WO When Meter Frequency is Reached? ☐

Time Based Frequency Meter Based Frequency

Meter Based Frequency Filter [x] 1 - 1 of 1

Meter	Description	Frequency	Units to Go	Generate WO Ahead By	Alert Lead
ODOM-M	Odometer Reading in Miles	6,000.00	3,644.00	[]	[]

Details

Meter *	ODOM-M	Odometer Reading in Miles	Average Units Day	0.00
Frequency	6,000.00		Rollover	100,000.00
Alert Lead	[]			
Generate WO Ahead By	[]			

Last Work Order Information

Meter Reading []
Meter Reading Date []

Next Work Order Projections

Next Meter Reading 6,000.00
Units to Go 3,644.00
Estimated Next Due Date []

3.1. USING THE LAST WO'S START INFORMATION TO CALCULATE NEXT DUE FREQUENCY

MAXIMO supports two methods of Work Order interval generation, based upon the setting of the *Use Last WO's Start Information* field on the PM Frequency Screen. This field, named target start date (in earlier Maximo versions) can be either fixed, meaning that a monthly PM would be generated every 30 days, or it can be floating - based upon the completion date of the prior generated PM Work Order. If the *Use Last WO's Start Information* field is checked, (which is the system default) then a PM Work Order will be generated every month, whether the prior month's work has been completed or not. If the *Use Last WO's Start Information* field is unchecked, then the second work order will not be generated until one month after the first Work Order has been completed (by MAXIMO 7's definition, the date that the prior Work Order is transferred to a status of 'COMP', 'CLOSE' or 'CAN').

While there may appear to be advantages to smoothing out work loads by un-checking the *Use Last WO's Start Information* field, there can also be unexpected negative consequences. Unless you do regular queries, or build reports to uncover delinquent PM Work Order activity, many of the PM Work Orders may quit generating entirely. One uncompleted or unrecorded Work Order completion will halt all subsequent Work Order generation. Also, schedules may slide such that a monthly PM procedure may only be completed 6 or 7 times in a year, rather than the expected 12 times per year. Once a schedule begins to float it may decouple the timing of certain procedures that were intentionally set to corresponding dates (such as work within the same building).

As the field is present on each PM record, a combination of the two methods may be used. Critical Assets should generally elect the fixed format to ensure that the proper number of PM events is completed each year. Less critical Assets might choose to use a floating format, thus scheduling work based upon prior event completion dates. For example, it would not be

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beneficial to change the oil in the car two weeks after the prior oil change, if the prior event had been deferred for an interval of two and a half months.

3.2. PM MAIN SCREEN

The screenshot displays the MAXIMO PM Main Screen. At the top, there's a navigation bar with 'Preventive Maintenance' and various utility links like 'Bulletins (0)', 'Go To', 'List Reports', 'Start Center', 'Profile', 'Sign Out', and 'Help'. Below this is a search bar with 'Find:' and a 'Select Action' dropdown. A tabbed interface shows 'List', 'PM', 'Frequency', 'Seasonal Dates', 'Job Plan Sequence', and 'PM Hierarchy'. The 'PM' tab is active, showing fields for 'PM' (PMP11430), 'Condensate Return Pump Quarterly Service', 'Site' (BEDFORD), and 'Status' (ACTIVE). Below these are 'Master PM' and 'Override Updates from Master PM?' checkboxes. The 'Details' section includes 'Location' (BR430), 'Asset', 'Route', 'Lead Time (Days)', 'Lead Time Active?' checkbox, 'Counter' (0), 'Use Job Plan Sequences?' checkbox, and 'Has Children?' checkbox. The 'Work Order Information' section shows 'Job Plan' (JP11430A), 'Description' (Centrifugal Pump Service- 3 Month), 'Supervisor', 'Crew', 'Lead', 'Work Group', 'Owner', and 'Owner Group'. It also includes 'Work Type' (PM), 'Last Start Date', 'Last Completion Date', 'Work Order Status' (WSCH), 'Priority' (9), 'Earliest Next Due Date' (9/8/08), and 'Interruptible?' checkbox. The 'Resource Information' section includes 'GL Account', 'Storeroom' (CENTRAL), 'Storeroom Site' (BEDFORD), 'Use this PM to Trigger PM Hierarchy?' checkbox, and 'Child Work Orders and Tasks Will Inherit Status Changes?' checkbox.

1. **PM Number:** The unique key field identifier. This value can be either a random or an intelligent field value. While Job Plans may be generic to many like objects in MAXIMO (e.g. quarterly PM servicing for Air Handlers), the PM record value is specific to only one Asset or Location record. Therefore, the Asset or Location building number could be used to form an “intelligent” PM key field value (e.g. PM-AHU0024).
2. **Location/Asset:** Only one of these values can be populated per PM record. The logic in this design was to accommodate the movement of Assets between Locations. Usually, if the Asset record is specified, the PM procedure is written against (and follows) the Asset object. Each Asset will then receive the PM work regardless of its current location. Even though the *Location field* is blank in the PM record, when the PM Work Order is generated, the system will capture the current Location for that Asset and populate it into the *Location field* of the Work Order.
3. **Route:** The PM record can be created against a Route rather than a singular Asset or Location. See a more detailed discussion of Routes later in this chapter.
4. **Lead Time (Days):** If this PM needs to be generated in advance of normal PM records (due to extended lead time for Parts procurement or required Permits) a number of days can be added to this field and activated by checking the *Lead Time Active* field. If, for example an additional two weeks is required to receive special-order parts, the 14 days entered here would be added to the number of days entered in the **Generate Work Order dialog box**. If PM Work Orders are processed at the end of the month for the next calendar month, the user would enter a value of approximately 30 days. This

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30 days plus the 14 extra days for special lead time would enable this PM to generate a new Work Order when the next due date was between 14 and 44 days in advance of the PM generation date.

5. **Counter:** Indicates the number of Work Orders generated under this PM and the current position with the multiple Job Plan sequence. This field is irrelevant for PM Records with only a single Job Plan, but defines which Job Plan will be used on the next Work Order for multiple sequence Job Plan PM Records. The counter initializes at 0 and advances by 1 each time a new Work Order for that PM record is generated. The counter can be adjusted under the **Select Actions** pull-down options list (**Set PM Counter**). When creating a new PM record for an already established PM program, the counter may have to be modified. For example, assume you are entering a new PM in MAXIMO 7, which includes both quarterly and annual Job Plan procedures. The first two quarterly PM Work Orders have already been completed earlier this year. The third quarterly is due on July 15. To properly align the MAXIMO 7 data with the existing PM Program, set the **First Start Date** to July 15 and modify the counter to 2, so that the System will generate only one quarterly Job Plan (event 3) prior to the generation of the annual Job Plan (event 4).
6. **Use Job Plan Sequences:** Indicates if there multiple Job Plans involved with the PM record (System controlled)
7. **Work Order Status:** Common practice is to field default this value to *WSCH* (Waiting for Scheduling) upon the insert of a new PM record. *WSCH* has the same status attributes as *APPR* (Approved). Since the Work Order module does not allow a user the option to change a Work Order from any other status to *WSCH*, this makes a valuable distinction for PM Work Orders (for query purposes), as only newly generated PM Work Orders would carry a status of *WSCH*.
8. **Supervisor:** The Supervisor's name that will be responsible for assigning Labor resources to Work Orders generated from this PM.
9. **Storeroom:** Since PM records may have a Job Plan that has estimated parts, the System needs to know which Storeroom to create the Part Reserve against.
10. **GL Account:** If a General Ledger Account value is entered here, it will populate the GL Account field for all Work Orders generated by that PM record, even overriding any GL Account value present on the Location or Asset record as it is the most specific reference. Common examples are Grounds, Janitorial and Traffic Light Inspections - events that need to be charged based on the activity as opposed to the Location.
11. **Lead/Work Group/Owner/Owner Group:** The designated person/group responsible for the work activities of generated Work Orders. Values in these fields are used to query and segregate Work Orders for assignment purposes.
12. **WO Priority:** The Priority that will accompany all Work Orders using this procedure.
13. **Interruptible:** An optional field to identify whether the tasks must be completed in a single setting, or whether the procedure can be started and stopped. This field is primarily used to conduct labor resource balancing in conjunction with project scheduling software.

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3.3. PM FREQUENCY SCREEN

When the Generate Work Order function is exercised, Work Orders will be generated in the MAXIMO database, which are visible in the Work Order applications - but unless custom programmed, they will not necessarily be printed at the time of their creation. Therefore, it will be valuable to know how to find the series of PM Work Orders that were generated during the past ___ hours or days. Go to the Work Order Tracking screen and enter a query with the following conditions: *Reported Date* (date of creation) is greater than (>) yesterday (or other date range of your choice) and Status = *WSCH*. Since only newly generated Work Orders can attain a status of *WSCH*, this query limits the Work Order records to only those newly generated Work Orders created through the PM process.

If your Organization does not use the status *WSCH*, for all PM records, replace that portion of the query by using *PM* in the Work Type field. For this part to work, be sure to check that all PM records have the value *PM* populated in the Work Type field. Supervisors can supplement this query by adding their Supervisor (or Craft) names - in order to limit the output to only their own department records.

Preventive Maintenance

Find: [] Select Action []

List PM Frequency Seasonal Dates Job Plan Sequence PM Hierarchy

PM PMP11430 Condensate Return Pump Quarterly Service Site BEDFORD Status ACTIVE

Work Order Generation Information

Use Last WO's Start Information to Calculate Next Due Frequency? ☒ Generate WO Based on Meter Reading (Do Not Estimate)? ☐

Generate WO When Meter Frequency is Reached? ☐

Time Based Frequency Meter Based Frequency

Frequency 90 Alert Lead (Days) [] Extended Date []

Frequency Units* DAYS Estimated Next Due Date 9/2/08 Adjust Next Due Date? ☐

The Frequency tab controls the timing of Work Order generation under this PM.

1. **Time Based Frequency:** In these fields, the calendar unit of measure can be defined. At each defined interval, a Work Order will be created. Choices include *DAYS*, *WEEKS*, *MONTHS*, or *YEARS*. If you wish to generate a PM on the same date each month, set the unit to Months, the frequency to 1, and the First Start Date to the desired date of commencement. Conversely, setting a PM to generate every four weeks or every thirty days will create a succession of Work Orders falling on various days of the month. To ensure that Work Orders do not generate on weekends, the *WEEKS* option works best.
2. **Estimated Next Due Date:** When creating a new PM record, the date in this field will serve as the initial Start date for the first Work Order event. If the PM needs to be interrupted for restart at a later date, one can edit this field to generate the desired future initiation date.

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If **Use Last WO's Start Information** is checked: After the first Work Order is generated, this field will add the frequency time to the *Last Target Start Date* to determine and populate the *Next Due Date* field.

If **Use Last WO's Start Information** is unchecked: The *Next Due Date* field will remain unpopulated until the prior Work Order has been moved to a status of *COMP*, *CAN* or *CLOSE*. From the date of status change, the defined frequency interval will be added to determine the new *Next Due Date*.

Example: The first quarterly PM Work Order was generated on March 30, 2010 for the new Boiler. However, the actual work was not completed for an additional six weeks, until May 15, 2010. If the fixed schedule is activated, the second Work Order will show a *Next Due Date* of three months after generation of the first Work Order (June 30). If a floating schedule is used, the *Next Due Date* will be blank from March 31-May 15, and the Next Due Date will be pushed out until July 15, ninety days after the status of the first Work Order shows completion.

3. **Extended Date:** This function allows a specific work event to be deferred from its normally scheduled generation date. If the normal expected Start Date cannot be met, you can enter a date in the **Extended Date** field to push the *Target Start* date of the upcoming Work Order into the future. This is common in maintenance departments that are production oriented or use shutdown/turnaround schedules. The *Adjust Next Due Date* field functionality allows the user to leave the next Work Order target date at its originally scheduled date or to move the next date out the same number of days as entered in the extended date field.

Preventive Maintenance

Find: [] Select Action [] Reports

List PM Frequency Seasonal Dates Job Plan Sequence PM Hierarchy

PM FL601995 NAVISTAR PMA Site FLEET Status DRAFT

Work Order Generation Information

Use Last WO's Start Information to Calculate Next Due Frequency? ☒

Generate WO Based on Meter Reading (Do Not Estimate)? ☐

Generate WO When Meter Frequency is Reached? ☐

Time Based Frequency Meter Based Frequency

Meter Based Frequency

Meter ODOM-M Description Odometer Reading in Miles Frequency 6,000.00 Units to Go 3,644.00 Generate WO Ahead By Alert Lead

Details

Meter ODOM-M Odometer Reading in Miles Average Units Day 0.00 Rollover 100,000.00

Frequency 6,000.00

Alert Lead

Generate WO Ahead By

Last Work Order Information

Meter Reading

Meter Reading Date

Next Work Order Projections

Next Meter Reading 6,000.00

Units to Go 3,644.00

Estimated Next Due Date

New Row

4. **Meter Based Frequency:** MAXIMO can generate PM Work Orders based on Meter readings (or other numeric scales), in addition to the calendar-based option. The PM record can be calendar only, meter only, or a combination of the two – with the first

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event triggering the next sequence for both measures. In our automobile example, we could establish a quarterly oil change to occur at the earliest event of either ninety days or 3000 miles (meter-based). On the 85th day, the odometer mileage reading as entered against the automobile (Equipment record) was registered at 3080 miles. The Work Order would generate at the next event of PM Work Order generation, setting the next interval at 6080 miles and the 175th day from the initial PM record creation.

If the desired value is not available from the values in the Meter field, go to the Meters application and create it. Frequency identifies the interval of meter units which will trigger a PM event. MAXIMO calculates an average usage rate and indicates that value in the *Average Unit Day* field. In the section above the Meter Based Frequency tab, users can choose to wait until the meter reading exceeds the threshold meter amount *or* have MAXIMO add the estimated daily usage and trigger the Work Order based upon that estimated threshold date. They can also choose to have the Work Order auto-generated when the meter threshold is reached.

5. **Active Season:** The Active Season option is used to automate the start and stop of Work Orders that should only be completed on a seasonal basis. For example, if the landscaping crew was scheduled to cut the grass on a weekly basis, the active season dates could be entered so that the Work Orders from this PM would only generate for the months from April through September.

4 THE METER AND METER GROUP APPLICATIONS

The meters functionality has been expanded in Maximo 7. There are now unlimited meters associated with Assets and Locations. A new Meter tab supports these applications. New *Meters* and *Meter Groups* applications have also been added.

The screenshot shows the Maximo Meters application interface. The main window has a 'Meters' tab selected. Below the tab, there are several fields: 'Meter' (RUNHOURS), 'Meter Type' (CONTINUOUS), and 'Reading Type' (DELTA). To the right of these fields, there are buttons for 'Run Hours', 'Continuous meter', and 'Incremental usage'. Further right, there are fields for 'Domain' and 'Unit of Measure' (HOURS). A 'Select Value' dialog box is open in the foreground, showing a list of meter types: CHARACTERISTIC, CONTINUOUS, and GAUGE, each with a corresponding description: 'Characteristic meter', 'Continuous meter', and 'Gauge meter'. The dialog box has a 'Cancel' button at the bottom right.

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The Meters application includes three types of meters: continuous (standard), characteristic (new type that uses an observation such as color for values) and gauges (fka measurement points and used with the Condition Monitoring application). Continuous meters are used to track readings that always escalate – such as mileage. Gauges are used to evaluate readings between a range of values (usually an acceptable upper and lower reading. When the new reading falls outside the value range, a Work Order is generated to address the condition.

Asset	Description	Site
12500	Overhead Crane #2	BEDFORD
11430	Centrifugal Pump 100GPM/60FT HD	BEDFORD
11450	Centrifugal Pump 100GPM/60FTHD	BEDFORD
11470	Centrifugal Pump 100 GPM, 60 FT-HD	BEDFORD
11480	Centrifugal Pump 100 GPM, 60 FT-HD	BEDFORD

In addition, there is a new Meter Groups application which is used to create groups of meters. Meter groups can be applied to assets, locations, and rotating item records, rather than applying each meter individually.

5 PM PROGRAMS WITH MULTIPLE SEQUENCED JOB PLANS

MAXIMO uses a “sequenced” format to address PM programs that contain multiple Job Plans. Many automated maintenance software products create three unique Job Plans for a quarterly, semiannual, and annual procedure. This results in the generation of three Work Orders at the fourth (or annual) interval, which may or may not be generated or scheduled simultaneously. With MAXIMO, the user duplicates the quarterly Job Plan record to create the semiannual Job Plan, adding and editing steps as required. Thus, the semiannual Job Plan is a combination of the quarterly and semiannual procedure. The combined semiannual Job Plan is then used to create a single Work Order at the second interval. By duplicating the semiannual into the annual procedure, again only one Work Order would be generated for the fourth interval.

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The screenshot shows the 'Preventive Maintenance' screen in MAXIMO. The PM record is for PMP11430, titled 'Condensate Return Pump Quarterly Service', located at 'BR430' and 'BEDFORD'. The status is 'ACTIVE'. The job plan sequence is listed as follows:

Job Plan	Description	Sequence
JP11430A	Centrifugal Pump Service- 3 Month	1
JP11430	Centrifugal Pump Service- 12 Month	4

Buttons for 'New Row' and 'Download' are visible at the bottom right.

Let's use an example. The O&M manuals for the larger Air Handling Units have called for both a quarterly and annual maintenance procedure. For our example, the only difference between the two procedures will be that the mechanic must conduct an Air Quality Chemical Test. To create a sequenced PM record, the quarterly Job Plan is duplicated (from the **Select Action** drop down list). The Job Plan (annual) is then given a different key field (Job Plan Number) and the adjustments to the operating steps, duration, labor estimates, and parts estimates are added.

The procedure will begin by generating the initial Work Order and the next two sequential Work Orders using the quarterly Job Plan. When the fourth event arrives, MAXIMO will get the Job Plan for the annual procedure and add it to the Work Order. The work sequence can be viewed from the Job Plan Sequence tab using the Select Action option **View Sequence**.

The screenshot shows the 'Job Plans' screen in MAXIMO. The job plan is INS11200, titled 'HVAC System Inspection', located at 'BEDFORD'. The status is 'ACTIVE'. The template type is 'Maintenance' and the duration is '2:30'. The job plan tasks are listed as follows:

Sequence	Task	Description	Nested Job Plan	Duration	Meter
10	Check Electrical Subsystems and components			0:00	
20	Check Motor and Mounts			0:00	
30	Check Filtration Units			0:00	
40	Conduct Air Quality Chemical Tests			0:00	

Buttons for 'New Row' and 'Download' are visible at the bottom right.

The 'Planned Labor' section shows the following details:

Task	Craft	Skill Level	Labor	Quantity	Hours	Rate	Line Cost
	MECH	FIRSTCLASS		1	1:30	25.00	37.50
	ELECT	FIRSTCLASS		1	1:30	22.00	33.00

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On the *Job Plan Sequence* tab of the PM record, we will then add the annual Job Plan procedure on the second line. Note in the lower half of the screen, the two different Job Plans are sequenced 1 and 4, as the annual procedure would occur on every fourth Work Order event.

The screenshot shows the Maximo Preventive Maintenance (PM) record for PM IC-11200. The 'Job Plan Sequence' tab is active, displaying a table with two rows of job plans. The first row is 'QM11200 HVAC System Quarterly Inspection' with a sequence value of 1. The second row is 'INS11200 HVAC System Annual Inspection' with a sequence value of 4. The status is 'DRAFT'. The table has columns for Job Plan, Description, and Sequence. A 'New Row' button is visible at the bottom right of the table.

Job Plan	Description	Sequence
QM11200	HVAC System Quarterly Inspection	1
INS11200	HVAC System Annual Inspection	4

The Job Plan that will be done most frequently will always have a sequence value equal to 1. (Note: If no Job Plan used an integer value of 1, then the PM program would generate the first Work Order without a corresponding Job Plan.) Also, the subsequent Job Plan procedures must be integer (whole number) multiples of the sequence of the first Job Plan. In our example, the annual procedure will be generated every fourth event, three quarterly Work Orders (with Job Plan QM11200) followed by a fourth Work Order containing Job Plan INS11200. If there was a semiannual procedure, it would have been given a sequence value of 2.

6 GENERATING PM WORK ORDERS

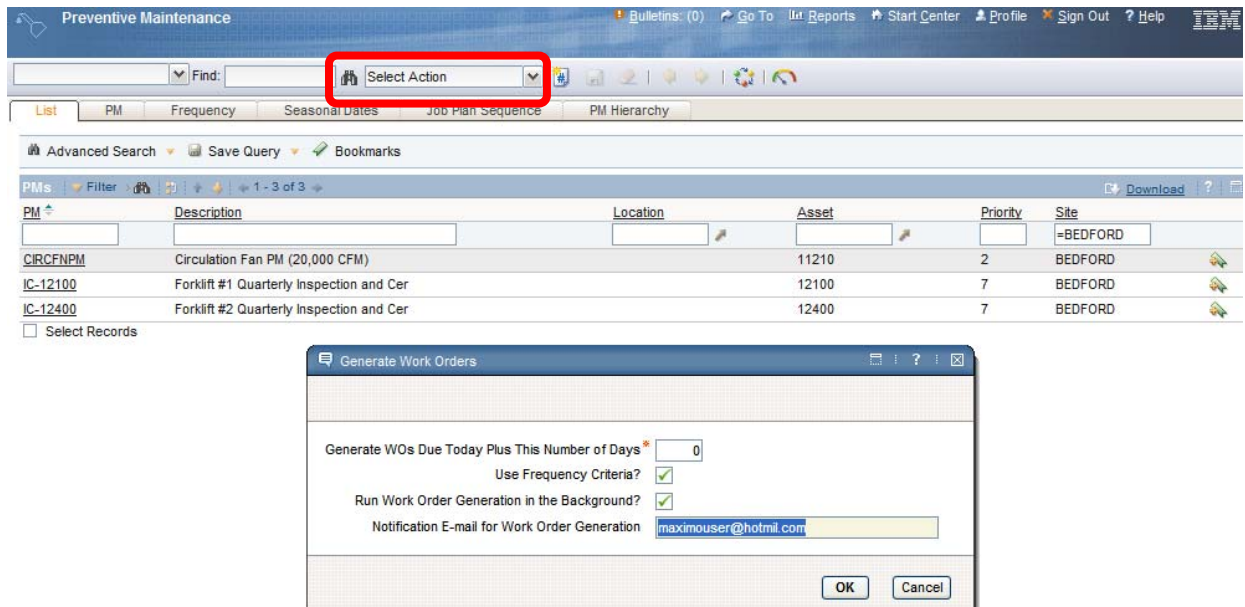
PM Work Orders can be generated at your site automatically using the Cron Task functionality. The name of the pre-built Cron Task is "PMWoGenCronTask". An Administrative user can access this record in the Cron Task Setup application and schedule the generation for a particular day of the week and time on a weekly or monthly interval basis. After activating the Cron Task, the server will begin executing the process according to the schedule established. Be sure to populate an e-mail address for the error log file to be received. It is the only certain way to know if all the PM records are generating.

Organizations may also choose to execute this process manually, letting the individual supervisors generate their own PM Work Orders on a time schedule of their own choosing. The Supervisors will then first run a query in the PM application to identify their own PM records. Entering =Active in the Status field is also helpful since PM Records that are in *Draft* or *Inactive* status will not generate Work Order records. The log file will generate a message such as "Cannot generate work order for PM CIRCENPM that is not in active status". Additionally a PM record will not generate Work Orders if it is written against an Asset or Location record or uses a Job Plan that is in an *Not Ready* status. The error message that accompanies a PM record

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against an Inactive is “*The Asset or Location associated with this PM has a status of NOT READY. Change the status to an active status in order to generate work orders.*” When the result set of your Work Orders appear, click on the **Select Action** menu list and select **Generate Work Orders** from the drop down menu list. The Generate Work Orders Dialog box will appear.



- 1. Generate WOs Due Today Plus This Number of Days:** This value determines how many days the system will “look ahead” for records that have a next due date prior to that time. If a 30 is placed in the field, Maximo will generate a Work Order for all PM records that have a next due date that is already due or will be due within 30 days from the current date. To allow time for a) scheduling of labor and b) receipt of parts, it is good practice to have this field value exceed the run interval by a few days. For example, if PM Work Orders are generated weekly, set the field value to 10 each time you run the process. This will give supervisors and storeroom personnel at least three days (and up to 10 days) before labor and parts will require dispatch.
- 2. Use Frequency Criteria:** This field is checked by default, meaning that the system will look at the next due date of each PM record to determine whether the record should generate a Work Order. If the user un-checks this field, then all records in the result set will generate a Work Order whether the due date has been reached or not. This feature is commonly used to generate an out-of-sequence event which will not disturb the underlying PM calendar. It is also used with shut-down PM hierarchies which do not have a pre-defined future calendar schedule.
- 3. Run Work Order Generation in the Background:** This returns computer operation back to the user while the PM Work Order generation process is taking place. If unchecked, the log file is presented on the screen after the generation activity is completed.

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4. **Notification E-mail:** The e-mail address listed will receive a copy of the PM log file when the PM Work Order generation process has completed. This file contains important information concerning PM records that were due for generation but did not execute. Examples of such occurrences include such things as: a bad GL Account, failure to identify the Storeroom in the PM record when Planned Materials are included in the Job Plan, or Inactive objects (Job Plans, PMs, Assets and Locations).

7 ROUTES

To reduce the volume of paperwork, users may find it expeditious to create a route to record a series of events as a singular work activity. For example, it may be easier to generate a single Work Order to complete the PM work on all exhaust fans or all air handlers on the same building roof. Routes can also be used to provide direction for a weekly lubrication route, or any set of events that can be treated as a single activity. The route can specify different Job Plans for each of the stops (Locations or Assets).

Note: For cost tracking purposes, if you choose to enter all costs (labor and materials) against the parent Work Order – as a single entry, then there will be no costs recorded directly against the Asset and Location objects specified as route stops. This would likely be fine for exhaust fans, but might be less desirable for more expensive assets such as Air Handling units. To incur costs against these individual Assets or Locations, the labor, materials, and service costs would have to be divided and be individually charged to each of the respective child Work Orders.

A Sample route is shown below:

The screenshot displays the MAXIMO Routes application interface. At the top, there's a navigation bar with links like 'Bullets: (0)', 'Go To', 'List Reports', 'Start Center', 'Profile', 'Sign Out', and 'Help'. Below this is a search bar with 'Find:' and a 'Select Action' dropdown. The main content area shows a route configuration for 'Route 1002' with the description 'Inspect Fire Extinguishers'. The 'Site' is set to 'BEDFORD'. There are checkboxes for 'Attachments' and 'Route Stops Inherit Status Changes?'. Below this, a section titled 'When this Route is applied to a Work Order, the Route Stops will become:' has three radio button options: 'Child Work Orders' (selected), 'Entries in the Work Order's Multi Asset, Location and CI Table', and 'Work Order Tasks'. The bottom section, 'Route Stops', is a table with columns: Sequence, Location, Asset, Asset/Location Description, and Job Plan. It lists 7 stops for 'Fire Extinguisher' inspections, each with a unique Asset ID (1001-1007) and the Job Plan 'INS1002'. At the bottom right of the table are buttons for 'Select Assets', 'Select Locations', and 'New Row'.

Sequence	Location	Asset	Asset/Location Description	Job Plan
10		1001	Fire Extinguisher	INS1002
20		1002	Fire Extinguisher	INS1002
30		1003	Fire Extinguisher	INS1002
40		1004	Fire Extinguisher	INS1002
50		1005	Fire Extinguisher	INS1002
60		1006	Fire Extinguisher	INS1002
70		1007	Fire Extinguisher	INS1002

To create a Route in MAXIMO, select the **Insert** icon at the top of the Route Application screen to create a new Route. Populate the top row with a route name and description and determine whether the parent Work Order created should change the status of all route stop (children)

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Work Orders in the checkbox entitled *Route Stops Inherit Status Changes*. As shown in the illustrations below, enter one row for each route stop assigned to an Asset or Location record and including the appropriate Job Plan procedure to be completed. The Job Plan can vary from one route stop to another. A Route Stop Description field has been added to permit users to enter more descriptive directions on the procedure or asset location.

Next, the Route will need to be associated with a PM record. If an Asset or Location record is entered in the PM screen, then the system will generate a Parent Work Order to that object, with Child Work Orders created for each of the route stops.

As shown in the illustrations below, enter one row for each route stop assigned to an Asset or Location record and including the appropriate Job Plan procedure to be completed. The Job Plan values can vary from one route stop to another if the **Child Work Orders** radio button is selected. However, the Job Plans must all be the same if the route stops are to be either **Entries in the Work Order's Multi Asset, Location and CI table** or **Work Order Tasks**. Next, the Route will need to be associated with a PM record. If an Asset or Location record is entered in the PM screen, then the system will generate a Parent Work Order to that object, with Child Work Orders created for each of the route stops.

Preventive Maintenance

Find: Select Action

List PM Frequency Seasonal Dates Job Plan Sequence PM Hierarchy

PM IC-67671 Fire Extinguisher Inspection and Certificate Site BEDFORD Status DRAFT

Master PM Override Updates from Master PM? Attachments

Details

Location NEEDHAM Needham Site Lead Time (Days) 0 Counter 0

Asset Lead Time Active? Use Job Plan Sequences?

Route 1002 Inspect Fire Extinguishers Has Children?

Work Order Information Responsibility

Job Plan INS1002 Description Fire Extinguisher Inspection Supervisor WILSON

Work Type Last Start Date Crew

Work Order Status* WSCH Last Completion Date Lead HORN

Priority 3 Earliest Next Due Date 08/07/08 Work Group

Interruptible? Owner Owner Group

Resource Information

GL Account Use this PM to Trigger PM Hierarchy?

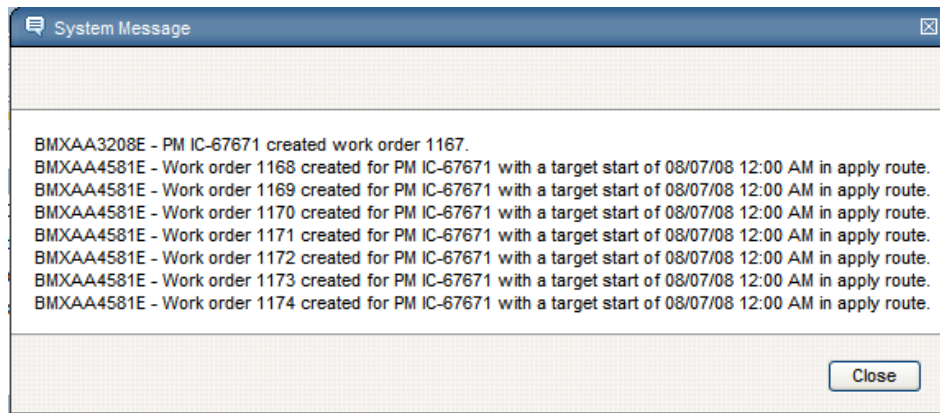
Storeroom CENTRAL Child Work Orders and Tasks Will Inherit Status Changes?

Storeroom Site BEDFORD

When the **Generate Work Order** option is selected from the PM application, the system will generate one parent Work Order (in this case against the Location, *NEEDHAM*) and child Work Orders for each of the seven route stops. After selecting the **OK button** to generate the Work Orders, MAXIMO checks the due date and if the due date is earlier than the current date plus the look-ahead days (30), the Work Order is generated.

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Note from the screen shot below, a parent Work Order is created (1167) with three tasks followed by each of the route stops (children) and their three task steps. The Work Orders generated bring over the information populated in the PM screen and the associated Job Plan. The screen below shows the three Task steps used by the Job Plan for each of the Route Stops.

Job Plans

Find: [] Select Action []

List Job Plan Work Assets Specifications

Job Plan: INS1002 Fire Extinguisher Inspection Organization: EAGLENA Site: BEDFORD Attachments []

Details

Status: ACTIVE Template Type: Maintenance Duration: 0:00 Classification: [] Class Description: [] Launch Entry Name: []

Default WO Class: [] WO Priority: 0 Interruptible?: [] Flow Controlled?: [] Suspend Flow Control?: [] Flow Action: [] Flow Action Assist?: []

Responsibility

Supervisor: [] Crew: [] Lead: [] Work Group: [] Owner: [] Owner Group: []

Job Plan Tasks

Sequence	Task	Description	Nested Job Plan	Duration	Meter
10	Check pressure.			0:00	
20	Inspect guage.			0:00	
30	Complete inspection tag.			0:00	

New Row

Labor Materials Services Tools

Planned Labor

Task	Craft	Skill Level	Labor	Quantity	Hours	Rate	Line Cost
10	MECH	APPRENTICE		1	0:20	16.50	5.50

New Row

Moving to the newly-generated Work Order of the Route Parent (1167), the Plans tab shows the seven Route Stops (Work Order children) and three task steps derived from the Job Plan.

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Work Order Tracking

Find: [] Select Action []

List Work Order Plans Related Records Actuals Safety Plan Log Failure Reporting Specifications

Work Order 1167 Fire Extinguisher Inspection and Certificate Site BEDFORD Status WSCH

Parent WO []

Children of Work Order 1167

Sequence	Record	Record Class	Summary	Location	Asset	Status
10	1168	WORKORDER	1001 Fire Extinguisher	MOFLOOR1	1001	WSCH
20	1169	WORKORDER	1002 Fire Extinguisher	MOFLOOR2	1002	WSCH
30	1170	WORKORDER	1003 Fire Extinguisher	MOFLOOR3	1003	WSCH
40	1171	WORKORDER	1004 Fire Extinguisher	MOFLOOR4	1004	WSCH
50	1172	WORKORDER	1005 Fire Extinguisher	CONF400	1005	WSCH

Select Assets Select Locations Select Work Orders New Row

Tasks for Work Order 1167

Sequence	Task	Summary	Estimated Duration	Status	Owner	Owner Group
10	10	Check pressure.	0:00	WSCH		
20	20	Inspect guage.	0:00	WSCH		
30	30	Complete inspection tag.	0:00	WSCH		

New Row

Labor Materials Services Tools

Labor

Task	Craft	Skill Level	Vendor	Quantity	Labor	Regular Hours	Rate	Line Cost
10	MECH	APPRENTICE		1		0:20	16.50	5.50

Select Craft New Row

8 REVIEW QUESTIONS

1. Go to the Search tab (Find sub tab) in the PM application. What query would you use to find all PM Work Orders that would be generated over the next 30 days? Would your query include all of the possible PM records that would generate Work Orders during that time frame? (Note: What if there were PM records with weekly frequencies? Is there a difference when using a fixed versus a floating schedule?)
2. Using the two Job Plans that you created in the Review Questions section of Chapter 2, insert a new PM record to establish a maintenance program associated with those Job Plans. Be sure to add both Job Plan procedures on the Job Plan Sequence tab.
3. Adjust the counter on the PM record to generate the less-frequent Job Plan as the next Work Order procedure. For example, set the counter to 3, if the Job Plans are quarterly and annual. Now check the Next Job Plan field. Was it changed?

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Job Plans

Find: [] Select Action []

Job Plan: [] Job Plan: [] Work Assets

Job Plan: [] Centrifugal Pump Service- 3 Month Organization: [] EAGLENA Site: [] BEDFORD

Work Assets and Safety Plans

Location	Asset	Item	Asset/Location/Item Description	Safety Plan	Default Safety Plan?
BR430	11430	PUMP100	Centrifugal Pump 100GPM/60FT HD	SPLAN2	<input checked="" type="checkbox"/>
			Centrifugal Pump 100 GPM, 60 FT-HD		<input checked="" type="checkbox"/>

Details

Location: [] BR430 Organization: [] EAGLENA Site: [] BEDFORD

Asset: [] Item: [] Safety Plan: [] SPLAN2 Default Safety Plan? ☒

Asset/Location/Item Description: [] Condensate Return Pump- Centrifugal/100GPM

Purchasing Details

Create WO When Purchasing This Rotating Asset? ☐ Work Type of Created Work Order: []

New Row

9 REVIEW QUESTIONS

1. Insert a new Work Order in the Work Order Tracking application and apply your new Safety Plan to that Work Order.
2. Go to the Work Order Tracking application and add Safety information to that Work Order that has not been previously created in the Plans applications

V. CHAPTER 5 – SCHEDULING WORK

Assigning and Scheduling Work



1 OBJECTIVE

Given the MAXIMO 7 platform, users will learn the optional methods of assigning and scheduling work, using stored queries, the Assignment Manager and Workflow.

2 OUTLINE

For years, work assignments and weekly schedules have been manually, whether the document was a chalkboard, legal pad or post computer-era - Excel spreadsheet. Even after CMMS products gained acceptance in maintenance shops, many users continued and still continue to build and track their weekly work assignment schedule outside of the CMMS software. Most Supervisors do, however, use the CMMS to query for Work Orders assigned to their areas. In MAXIMO 7, there are a variety of fields that can carry the assignment information.

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Work Order Tracking

Find: [] Select Action []

List Work Order Plans Related Records Actuals Safety Plan Log Failure Reporting Specifications

Work Order: 1000 Relocate Guard Rails Around Compressor Site: BEDFORD Attachments: []
Location: BR300 Boiler Room Reciprocating Compressor Class: WORKORDER Status: WAPPR
Asset: 11300 Reciprocating Compressor- Air Cooled/100 CF Work Type: CM Status Date: 06/02/99 2:25 PM
Configuration Item: [] GL Account: 6210-300-??? Inherit Status Changes? [x]
Parent WO: [] Failure Class: [] Accepts Charges? [x]
Classification: [] Problem Code: [] Is Task? []
Class Description: [] Under Flow Control? []
Launch Entry Name: [] Suspend Flow Control? []
Flow Action: []
Flow Action Assist? []

Job Details Asset Details Priority

Job Plan: [] Asset Up? [x] Asset/Location Priority: 5
PM: [] Warranties Exist? [] Priority: 2
Safety Plan: SPLAN1 SLA Applied? [] Priority Justification: []
Contract: [] Charge to Store? [] Risk Assessment: []

Multiple Assets, Locations and Cts Filter [] Download []

Asset	Location	Configuration Item	Target Description	Sequence	Progress?
...No rows to display...					

Select: [] Clear All [] New []

Scheduling Information Follow-up Work

Target Start: 31/01/08 8:00 AM Actual Start: [] Originating Record: []
Target Finish: 31/01/08 3:00 PM Actual Finish: [] Originating Record Class: []
Scheduled Start: [] Duration: 10:00 Has Follow-up Work? []
Scheduled Finish: [] Time Remaining: [] Interruptible? []
Predecessors: []

Responsibility

Reported By: Joe Jones
Reported Date: 31/01/08 12:18 PM
On Behalf Of: []
Phone: x1311

Supervisor: MILLER
Crew: CREW1
Lead: KAZMER
Work Group: []

Owner: []
Owner Group: []
Service Group: []
Service: []

3 STORED QUERIES

In prior Maximo versions, there were only the *Supervisor*, *Lead Craft*, *Work/Labor Group* and *Crew* fields for assignment purposes. The most popular field for dividing responsibilities is the *Supervisor* field has been used by those responsible for making assignments. The field value was populated in the *Supervisor* field of the PM record for proactive work and was either populated by the call desk personnel at entry point or by an administrative assistant who collects a group of all Work Orders without supervisor entry (null field), and routes them to the appropriate supervisor.

On a daily or even hourly basis, the supervisor would log into Work Order Tracking and search for all records with the appropriate *Supervisor* field value and a status that means work activities have not yet begun. For most MAXIMO 7 users, this would be WSCH (Waiting to be Scheduled) for new PM work and WAPPR (Waiting for Approval) for non-PM activities. The *Lead* field is intended to represent the person in charge of physically completing the work. *Crew* can be applied if the shop personnel are dispatched in teams. *Person Group* is generally

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utilized with the MAXIMO 7 Workflow product discussed later in this chapter. The *Vendor* field can be used to indicate an external contractor that may be responsible for this type of work.

Both supervisors and leads can have their MAXIMO dashboards configured in a manner that the uncompleted work appears in the form of rows in a result set on the front page of MAXIMO. New assignments are continually appending the list while other rows will disappear when the Work Orders are assigned (by supervisors) or completed (by leads).

The second set of values (to the left) of *Owner*, *Owner Group*, *Service* and *Service Group* have field values that are generally set within the Service Desk applications and become populated with Change, Release and Activity type Work Orders. From the main screen, the *Service* and *Service Group* fields are editable in Work Order Tracking, while the *Owner* and *Owner Group* are read-only and must be populated through the use of the Select Actions option *Select Ownership* or *Take Ownership*. This allows the Administrators to control which users can edit the Ownership fields (field level security).

VI. CHAPTER 6 - MAXIMO WORK ORDERS

THE WORK ORDER PROCESS, INITIATION OF CORRECTIVE AND PREVENTIVE MAINTENANCE ACTIVITIES



1 OBJECTIVES

Given the Maximo 7 environment, create and properly maintain a Maximo Work Order including tracking its progress through the change of statuses. Identify the reasons for planning work activities as it relates to Labor, Materials and Tools. Explain how parent/child Work Orders and cost rollups are structured in the Maximo environment.

2 OUTLINE

2.1 INTRODUCTION

Work Orders constitute the heart of any Automated Asset Management System. The use of manual Work Orders and Preventive Maintenance (PM) procedures pre-date the existence of computers by many years. Before the advent of the computer era, scheduling and completion of Work was processed on a columnar pad or chalk board while PM events were pulled as index cards from the monthly tabs of an index card file box. The automation of this process began in

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the late 1980s – including the tracking of buildings, equipment, inventory parts and cost centers, making the maintenance process more efficient and less expensive to maintain. Through proper implementation of the Maximo software, maintenance personnel will have immediate access to the entire work history of specific Assets and Locations, including a history of individual work tasks performed, required safety procedures, labor, material and tool resources deployed, and even a bill of materials (detailed parts list) accompanying those assets.

Below is a quick review of the value proposition of Maximo 7's Work Order Module in terms of meeting Organization maintenance objectives.

Organizations possess a wide range of critical, and oftentimes, expensive assets that need to be accounted for, tracked, and properly maintained. Many Organizations have exacting work and reporting standards and require full compliance with regulatory requirements.

To optimize current and future asset purchases, a Total Cost of Ownership figure needs to be developed for these assets including a proper allocation of initial purchase as well as ongoing maintenance costs.

It is imperative to maximize performance and extend the life of all physical assets through the generation of a proper Preventive Maintenance Work Order schedule. Breakdown Work Orders are estimated to be four times more expensive than planned maintenance activities without considering the value of lost production.

Finally, to accomplish more with less - improve the productivity of Labor, as a result of better Scheduling and Planning, and to reduce the required volume of on-hand Material resources while reducing “stock-out” events.

Work Orders are initiated into Maximo from two sources. First, they may be created as a response to emergency and corrective incidents, and second, they may be for periodic maintenance activities necessary to properly maintain and optimize the useful life of Assets and Locations. Incoming Work Orders should be evaluated for proper labor and material resource allocation, to reduce “dry run” trips to the Work Order site. Based upon these estimates, supervisors then prioritize and schedule completion of the tasks. Maximo 7 can assist supervisors in scheduling work for employees in contiguous areas, reducing indirect transit time component.

2.2 COMPLETION

Upon the completion of the Work Order, users will enter the transactional history into the Maximo 7 database, including a charge for labor (time spent multiplied by cost per unit) and materials (part quantity multiplied by part cost). Maximo 7 already stores the labor pay rates and cost of each inventory item, thus Users need only enter the correct labor and time spent, plus the part ID along with the quantity of parts used. The labor and material costs become associated with that Work Order, as well as becoming a charge to the Location and/or the Asset specified in the Work Order. In this manner, Users are able to view their most costly assets a) in terms of total dollars and b) in terms of percentage cost to purchase price.

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2.3 PARENT / CHILD

If the Work Order is a Parent / Child relationship, the Parent Work Order will display its own direct cost plus the cost of all of its subordinate Work Orders. There are pre-constructed reports in Maximo 7 that will calculate the specific hierarchical costs to Asset and Location objects, including the cumulative cost of all charges against that object and all of its children. For example, users might want to calculate the cost of maintaining a single building, or the accumulated cost of a number of buildings within a particular campus. Likewise, on the Asset side, the cost of a boiler could be viewed as the singular cost of those Work Orders specifically charged against the boiler, or include all charges against it and its various children: the boiler, furnace, condensate return pump, feed water pump and the associated motors (children of the pumps).

3 INDUSTRY STANDARDS AND BEST PRACTICES

3.1 BUILD AN EFFECTIVE PREVENTIVE MAINTENANCE PROGRAM

As an “industry Standards” or “Best Practices” procedure, Organizations should develop a process to record all new incoming Assets and Locations. Just as the Purchasing department records the cost of each newly purchased asset and assigns it an asset number and tag, maintainable assets should be processed by the maintenance department for registration into Maximo 7. Nameplate and specification information can be collected and entered into Maximo. Based upon the manufacturer’s O&M manuals, Job Plans and a PM record should be created to support the ongoing maintenance program for that asset.

Preventive Maintenance on most assets is generally scheduled on a calendar or date driven basis, daily, weekly, monthly, quarterly, or annually. In other instances, you may wish to use a maintenance schedule based upon usage volume, such as the increase in a meter reading, or other non-calendar driven parameter. For example, an automobile requires an oil change every three months or 3000 miles, whichever comes first. Maximo supports either (or both) methods of triggering Preventive Maintenance Work Orders. While the manual entry requirement of meter readings has restrained the use of non-calendar PMs, wireless transfer of data from machine to Maximo 7 will increase in usage dramatically in the coming years.

To reduce equipment failure events and overall costs, Organization have moved from a “reactive” posture to a “proactive” one. Management must recognize that there is an initial ramp-up in costs to execute the increased initial level of PM activity, but historical data indicates that, within a six to nine month period, a measurable reduction in failure events and overall maintenance expenses will appear. Progress can be monitored on a monthly basis comparing the planned to unplanned Work Order time spent and costs.

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Open the **Work Order Tracking** application and perform the following steps:

1. The first step in creating a Work Order is initiated when the User clicks the **Insert Record** button and a unique number is assigned to the new record.
2. The user who wishes to create a record must populate all required information before the record can be saved. All required fields are designated with a red asterisk (*).
3. According to your Organization's business practices enter a meaningful and complete description of the issue requiring maintenance, identify the location(s) and asset(s) involved and select a supervisor, craft, labor group or other responsible party to direct the activities.
4. A record is not created / saved until the User clicks on the diskette icon.

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4.1 PRIMARY COMPONENT FIELDS

4.1.1 WORK ORDER NUMBER

The Work Order number is a sequential, system-generated autonumber value. Whenever the Insert button is clicked by any of the Organization users, this number will increment by one. As with all primary key fields, the Work Order number must be unique and is not editable after the record has been saved.

4.1.2 DESCRIPTION

When filling out the description field of the Work Order, the User should give as much detail about the problem being reported, including the service requested and more specific Location instructions, if necessary. This field should describe the work that needs to be accomplished and any other notes for the participating workers (permits, safety issues, etc.). If the necessary number of characters exceeds the field size, additional text can be entered into the long description field (accessed on the page icon directly to the right of the description field). When a long description field has been populated, the icon will change color to orange. This notifies Users that text is populated there. For tracking purposes, it is often suggested that the entry date and the User's initials should be entered prior to the descriptive text for each entry made to the long description field.

4.1.3 WO PRIORITY

This field will define the criticality of the Work Order activity.

4.1.4 WORK TYPE

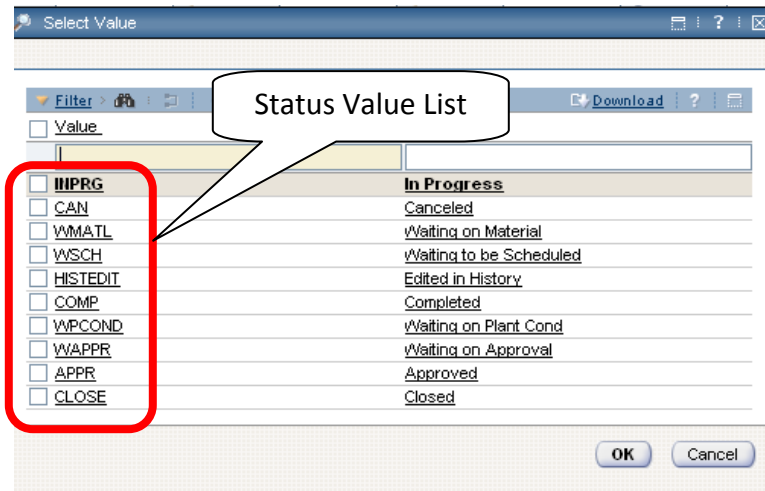
This field allows the user to classify the Work Order's type of work to be performed. Your Organization can add to the list of Work Types.

4.1.5 STATUS

This required field represents the current standing of each Work Order in the Maintenance process. As the user clicks the Insert Work Order button in Work Order Tracking, and a new Work Order is generated, this field is populated automatically with the status of Waiting for Approval (WAPPR).

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The following table lists the default Maximo statuses (in time order), and whether or not monetary transactions can be charged against a Work Order with the associated status. Your Organization can add “synonym” statuses to the default list of statuses.

STATUS	DESCRIPTION	SYNONYMS	CAN CHARGE \$
WAPPR	Waiting Approval		N
APPR	Approved	Waiting on Plant Cond (WPCOND)	Y
WSCH	Waiting for Scheduling		Y
WMATL	Waiting on Material (WMATL)		Y
INPRG	In Progress		Y
COMP	Completed		Y
CLOSE	Closed		N
CAN	Canceled		N
HISTEDIT	Edited in History		Y

4.2 ACTIONS AND PRIMARY WORK ORDER FIELDS

4.2.1 CLICK ON THE CHANGE STATUS BUTTON

If a User does not have the authority to change a Work Order’s Status, the button will not be visible on the toolbar. Signature authority is available individually for each status, so that a mechanic might have authority to change a Work Order Status to *COMP* (Complete), but not be able to change the status to *APPR* (Approved).

4.2.2 CHOOSE THE NEW STATUS

From the Value list and click **OK** to return selected value to the Work Order.

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4.2.3 WORK GROUP

This field populated to transfer the responsibility assignment to the proper Work Group/Department. If the Labor Group field is populated a default value from the Labor Group application will automatically populate the Lead Craft/Person field directly below.

4.2.4 SUPERVISOR

The Supervisor's name that will be responsible for assigning Labor resources to this Work Order. This could be entered by the initiator of the Work Order or auto populated from Supervisor values in the PM record.

4.2.5 REPORTED BY / REPORTED BY DATE

These read-only fields indicate the User and the time stamp recorded at the creation point of the Work Order.

4.2.6 LEAD

This field can be used to indicate the primary technician responsible for completing the work on the associated record.

4.2.7 LOCATION

This field represents the site area in which work is to be performed. This field is user populated, unless the Asset field is populated first, in which case the Location associated with that Asset will be carried over to the Work Order. It is essential that Locations be correctly entered. Personnel dispatched to the site must be able to accurately identify the exact work area, and also ensure that all costs incurred are charged to the appropriate General Ledger/Cost Center accounts. When the location value is entered, other location information is transferred from the Location record into the Work Order using Maximo crossover field functionality.

4.2.8 ASSET

This field is used when a Work Order is created against an existing Asset record. The Work Order may inherit some values from the Asset record, such as Asset/Location priority and Failure Class. When one of the values for the Asset and Location information is null, then the populated value moves into the Work Order record. If both Asset and Location value are populated but not the same, the Work Order will inherit the value from the Asset record, as a more specific reference.

5 WORK ORDER HIERARCHIES

Maximo 7 allows Users to group Work Orders utilizing a Parent Child relationship. In building these relationships, Users have the ability to sequence work sets and roll up all costs to the parental Work Order.

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The first step in building these hierarchical relationships is identifying or creating the Parent Work Order. By default, the system will update status changes to hierarchical Child Work Orders whenever the status of Parent Work Order changes. By deselecting the Change Status on Child Work Orders block on the Parent Work Order, status changes will not roll down to Child Work Orders. If the current work order is actually a child of other Work Orders, the Parent WO field will be populated with the Work Order Parent.

The *Accepts Charges?* field will prohibit charges to the parent Work Order if it is deselected.

Next, the User must identify or create the Work Orders that are to be Children Work Orders. If the User is making an existing Work Order a child, the User can 1) edit the Parent WO field from the child WO record or 2) bring up the child Work Order in the Work Order Tracking main screen and choose the **Assign To New Parent** option located under the Select Action menu or the User can create new Work Orders, by entering new rows, from the Plans tab of the Parent record.

Work Order Tracking

Find: [] Select Action []

Work Order: 7000 FUEL STORAGE PROJECT

Location: NEEDHAM Needham Site

Asset: []

Configuration Item: []

Parent WO: []

Classification: []

Class Description: []

Site: BEDFORD

Class: WORKORDER

Work Type: CP

GL Account: 6000-300-???

Failure Class: []

Problem Code: []

Status Date: 9/23/98 9:35 PM

Inherit Status Changes? ☒

Accepts Charges? ☒

Is Task? ☐

Under Flow Control? ☐

Comments: WAPPR

The user also has the ability to view all Child Work Orders assigned to the Parent by first bringing up the Parent Work Order in the Work Order Tracking main screen, and then clicking on the Plans sub tab.

Work Order Tracking

Find: [] Select Action []

Work Order: 7000 FUEL STORAGE PROJECT

Location: NEEDHAM Needham Site

Asset: []

Configuration Item: []

Parent WO: []

Classification: []

Class Description: []

Launch Entry Name: []

Site: BEDFORD

Class: WORKORDER

Work Type: CP

GL Account: 6000-300-???

Failure Class: []

Status Date: 9/23/98 9:35 PM

Inherit Status Changes? ☒

Accepts Charges? ☒

Attachments: []

Status: WAPPR

Flow Action Assist? ☐

Priority: 0

Asset Up? ☐ Asset/Location Priority: []

Warranties Exist? ☐ Priority: 0

Job Details

Job Plan: []

PM: []

Report Downtime

Manage Downtime History

Assign To New Parent

Cancel/Save/Modify

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The Child Work Orders are listed in a Table Window directly above the Tasks of the Parent. There is an icon to the left of the label “Work Order ____’s Children” that will expand/contract the view of the Child Work Orders. New Child Work Orders can be reviewed, edited, and created from this screen.

The screenshot shows the 'Work Order Tracking' interface. The 'Plans' tab is selected and highlighted with a red box. A callout 'Plans Tab' points to it. The 'Children of Work Order' section shows a table with columns: Sequence, Record, Record Class, Summary, Asset, and Status. The first row is highlighted with a red box, and a callout 'Child Work Orders' points to it. The 'Record' column contains values 7100, 7200, and 7300. A callout 'Move to Child Buttons' points to the expand/collapse icons in the 'Record' column. The 'Status' column contains 'WAPPR'. A callout 'Maximize/Minimize Section' points to the maximize/minimize icons in the top right. The 'Tasks for Work Order 7000' section is visible below, with a callout 'Create New Child Button' pointing to the 'New Row' button.

Users are able to navigate to the Parent or Child Work Order by clicking the Select button located next to either the Child or Parent WO field.

The screenshot shows the 'Work Order Tracking' interface with a child work order selected. The 'Work Order' field is highlighted with a red box, and a callout 'Child Work Order' points to it. The 'Parent WO and Move to Parent WO icon' callout points to the 'Select' button next to the 'Work Order' field. The 'Children of Work Order 7100' section shows a table with columns: Sequence, Record, Record Class, Summary, Location, Asset, and Status. The first row is highlighted with a red box, and a callout 'Children of Child Work Orders' points to it. The 'Record' column contains values 7110, 7130, 7150, and 7170. The 'Status' column contains 'WAPPR'.

The Plans tab in Work Order Tracking also offers the user the ability to create new Child Work Orders or Tasks by clicking on the **New Row** button.

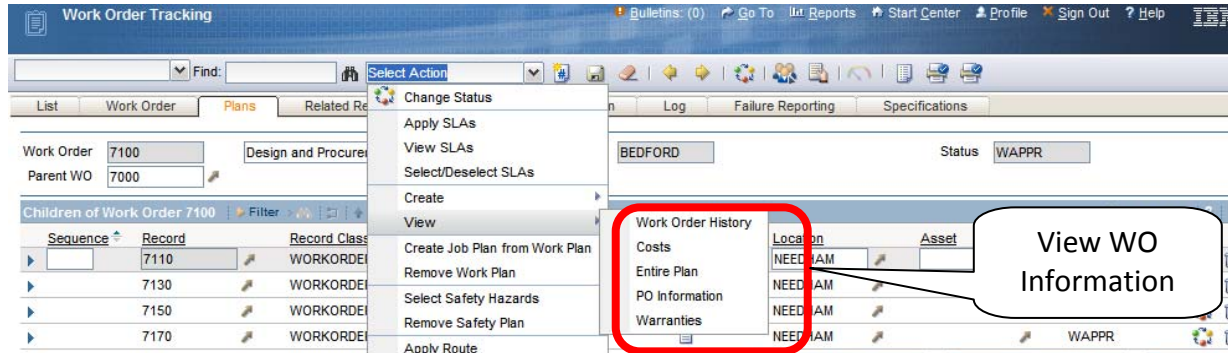
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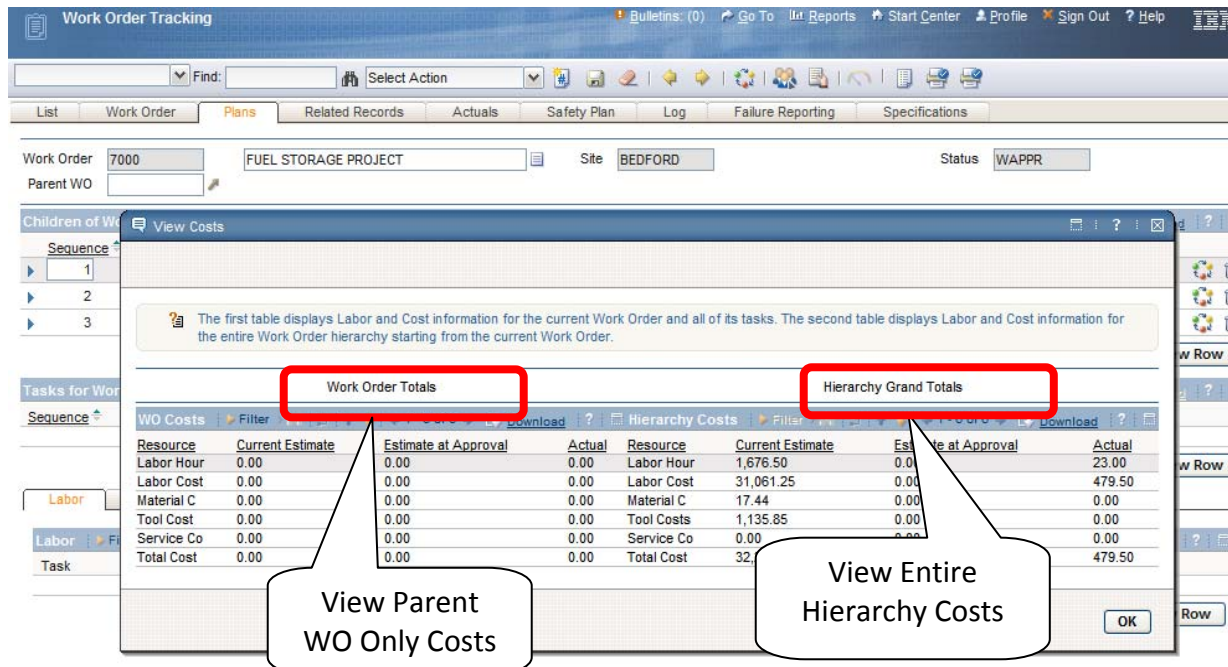
The User has the ability to sequence Tasks / Work Orders in the record set.

After completing new rows for each of the Child Work Orders, click the **Save** button (on the menu bar). This will commit your additions to the database.

To view the Cost Roll Up information for a Parent Work Order, Users can select the View Cost pull down option from the Select Action menu. This will total all scheduled hours and costs as well as actual hours and costs for the WO ancestor.



Result – Display of Costs to Parent Only and Parent plus Children (Roll-Up)



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6 FOLLOW-UP WORK ORDERS

A Follow-up Work Order does not build a true parent child Work Order relationship. The Follow-up Work Order does not appear on the Plans tab of the Parent (Original WO), nor does the Parent roll-up the costs of the Follow-up Work Orders. However, the Follow-up Work Order can indicate that a new Work activity was a) created from or b) completed in conjunction with the originating Work Order. For example, after completing repair work on an emergency generator in the boiler room, you might want to generate a new Work Order to rebuild the door frame, or to repair wall damage. In order to close your activity, but to maintain a “queryable” relationship between your wall replacement Work Order and the secondary Work Order, a follow up Work Order might be appropriate. In the screen shots below, a Follow up Work Order was generated from the initial repair Work Order.

The screenshot displays the Maximo Work Order Tracking interface. The 'Select Action' menu is open, with the 'Create' option highlighted. The 'Work Order' sub-menu is also visible. The 'as Follow-up Work?' checkbox is checked in the 'Follow-up Work' section.

Work Order Tracking

Find: [] Select Action []

Work Order | Plans | Related Re | Log | Failure Reporting | Specifications

Work Order: 1008 | Repair Damage | Site: BEDFORD | Attachments: []
Location: BR230 | Boiler Room | Class: WORKORDER | Status: WAPPR
Asset: 11230 | Emergency | Work Type: CM | Status Date: 12/31/98 9:33
Configuration Item: [] | GL Account: 6210-300-??? | Inherit Status Changes? []
Parent WO: [] | Failure Class: [] | Accepts Charges? [x]
Classification: [] | Problem Code: [] | Is Task? []
Class Description: [] | Under Flow Control? []
Launch Entry Name: [] | Suspend Flow Control? []
Flow Action: []
Flow Action Assist? []

Job Details

Job Plan: []
PM: []
Safety Plan: []
Contract: []

Multiple Assets, Locations and CIs | Filter []

Asset | Location | Configuration |
No rows to display...

Scheduling Information

Target Start: 12/31/98 7:00 AM
Target Finish: 1/1/99 7:00 AM
Scheduled Start: []
Scheduled Finish: []
Duration: 24:00
Time Remaining: []

Follow-up Work

Originating Record: []
Originating Record Class: []
as Follow-up Work? [x]
Interruptible? []

In the creation of the Follow-up Work Order, the system duplicates certain information from the originating Work Order, so the Description field, Supervisor, Work Type information and other planned information may need to be edited to reflect the circumstances of the new activity. After creating a Follow-up Work Order, the Has Follow-up Work will become checked on the originating Work Order.

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The screenshot shows the Maximo Work Order Tracking application. The 'Work Order' tab is selected, displaying details for Work Order 1164. The 'Originating Record' field is highlighted with a red box and labeled 'Originating WO Button'. The 'Originating Record Class' field is also highlighted with a red box and contains the value 'WORKORDER'. The 'Status' field is set to 'WAPPR' and the 'Status Date' is '7/3/08 1:18 PM'. The 'Work Type' is 'CM' and the 'GL Account' is '6210-300-???'. The 'Failure Class' and 'Problem Code' fields are empty. The 'Is Task?' checkbox is checked. The 'Under Flow Control?' and 'Suspend Flow Control?' checkboxes are unchecked. The 'Flow Action' and 'Flow Action Assist?' fields are empty. The 'Attachments' field shows 'WAPPR'. The 'Job Details' section shows 'Multiple Assets, Locations and CIs'. The 'Scheduling Information' section shows 'Target Start', 'Target Finish', 'Scheduled Start', and 'Scheduled Finish' fields. The 'Follow-up Work' section shows 'Has Follow-up Work?' and 'Interruptible?' checkboxes.

Note in the screen shot above, to the right side of the screen, there is a field labeled Originating WO. By selecting the Arrow button, you can navigate back to the original Work Order. Rather than roll the entire cost of a repair procedure into a PM activity (which distorts the average time deployed to the task), the use of Follow-up Work Orders creates a separate event for both work activities, while maintaining the relationship between the two events.

7 REVIEW QUESTIONS

1. A call has come in to your department concerning a water leak in one the housing units. Create a Work Order for the Location of your choice, estimating the labor time at 2 hours. As this is an Emergency situation and needs immediate attention, enter the correct Work Type and change the Status of the Work Order to *APPR*.
 - Navigate to the Work Order Tracking application Search screen and select the New Work Order button on the toolbar.
 - Enter a description of the Asset in the field to the right and a long description by activating the page icon.
 - Using the search functionality of the detail (arrow) button next to fields such as Location and Vendor, search for an existing database value and enter it in the appropriate field.
 - Populate the other fields on the Main screen and check the other tabs in this application to complete the record
 - Save the record suing the diskette button on the toolbar.

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2. You have received a follow-up call that several Fluorescent Light Bulbs need to be replaced at the same Location. Create a Follow-up Work Order to dispatch a General Mechanic to the Location. Where would you go to navigate between the Originating and Follow-up Work Orders?
3. Create a Project (parent) Work Order of your choice. Using one of the methods described in this chapter, add three children Work Orders that support this project. Practice transferring the record from the parent to one of the Sub Work Orders and back again. Identify the place where the total costs can be viewed for the parent Work Order and all of the Sub Work Orders.

VII. CHAPTER 7 - WORK ORDER TRANSACTIONS

Recording Labor, Materials, and Tools



1 OBJECTIVE

Given the Maximo 7 platform, users should be able to proficiently enter Labor, Material and Tools Usage for a given Work Order and then complete the Work Order process according to your Organization's current business processes (using the appropriate entry screen, record status modifications and failure reporting).

2 OUTLINE

2.1 WORK ORDER TRACKING AND QUICK REPORTING APPLICATIONS

The following exercises can be completed in either the Work Order Tracking module or Quick Reporting applications, whichever is preferred by your Organization. Users can perform a number of tasks in these applications.

This first and primary objective is track activity and to report labor and material charged in the completion of a Work Order.

Users also have the ability to change the Work Order's status as the work itself moves from one phase to the next. For example, when the work portion of the assignment is completed, the individual entering the data should change the status to Complete (COMP); otherwise, it will remain on the backlog list and possibly be inadvertently reassigned.

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Failure Reporting, Task Completions and other vital fields on the Work Order may need to be appended or modified.

3 QUICK REPORTING APPLICATION

Approval authorization in Maximo 7 differs in the creation of Work Orders in Quick Reporting as compared to Work Order Tracking. In Work Order Tracking, the initial status of a newly-created Work Order is *WAPPR*. In Quick Reporting, the process skips the approval process and immediately starts the Work Order with a status of *INPRG* (In Progress). This functionality was intended to address those events that require immediate action, or for use with shops where many work activities did not require a formal approval process (self-empowered maintenance personnel). Each Organization can choose whether to permit or prohibit the creation of Work Orders in the Quick Reporting application. Note: Regardless of which Work Order application the Work Order is created within, it will be visible from all other Work Order applications. The Work Order applications share the same database table; they just show a different view of the record (fewer fields in Quick Reporting and a more complete view of Work Order details in Work Order Tracking).

3.1 ENTERING DATA

3.1.1 LOCATING THE WORK ORDER

Querying for a Work Order can be done by either using the List screen from a Work Order application, or by using the **Select Value** or **Go To Work Order** functions from the Work Order field of a non-Work Order applications:

3.1.2 USING THE SELECT VALUE FUNCTION

This allows the user to query on two fields at once, the Work Order Number or Description fields. When entering the search criteria, both of the fields will be searched for data matches. If matches are found, the data set will be listed in the Results sub tab.

By using the Go To Work Order function, the user will be brought to the Work Order Tracking application. Once inside the application, the user will have all of the querying abilities associated with that more detailed application.

From the Work Order application, users have the ability to use the Quick Key Search on any of the Work Order screens when the (WO) record number is known.

3.2 REPORTING ACTUAL RESOURCE USAGE

Once a Work Order has been received an Approved or higher status, the User can manually enter (or copy from the Work Plan) costs and other information concerning that Work Order utilizing the Labor, Materials, Tools, Meters, and Failure Reporting sub tabs.

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3.3 APPLYING LABOR UTILIZING PLANNED LABOR

Work Plans associated with a Work Order can be used to apply labor charges to that Work Order. To do so, the user should follow these steps.

First click on the **Select Planned Labor** button located under the Labor Actuals sub tab.

A dialog box will appear showing all planned labor entries associated with that Work Order. The user can then pick the Labor entries from those plans by either clicking on the boxes to the right of the planned entries, or by clicking the top checkbox which will select all rows from the Plan. The user must then click the **OK** button to return to the Work Order screen with the captured Labor Code, Labor Name, Estimated Hours, and a default Start Date. If the Plan carries a Craft designation, the Labor code field will be cleared, awaiting the entry of a real person. Click the arrow to the right of the Labor field and choose **Select Value**. A list of Labor records matching the Craft designation will appear. Select the correct individual and then the **OK** button to return the name to the screen.

Click the arrow at the left margin in order to expand the row detail for editing the information from the Labor rows after they have been entered.

Additional information such as the Hours and Scale (Pay Rate multiplier) information may need to be updated in the pull down screen. Upon completing the required data, the User can click the **Save button** or the **New Row button** to make additional Labor entries.

It is important to note that entries made from Labor transactions become read-only (uneditable) after the Save button has been selected (unless the Maximo Administrator has turned off the Auto-Approved Labor option). Since the row data cannot be edited, Users may need to make an offsetting entry to adjust for incorrect entries into the Actual screens (Labor, Materials, or Tools). For example, let's presume that a User enters one hour of time and saves the transaction. The next day, the user remembers that the correct charge was really 30 minutes. The user would return to the Work Order Labor Actuals screen for that Work Order and post an entry for minus 30 minutes (-:30).

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The screenshot shows the Maximo Work Order Tracking interface. A red box highlights the 'Work Order' field with the value '1009'. A callout bubble points to this field with the text 'Work Order'. Below the work order field, the 'Labor' sub-tab is highlighted with a red box and a callout bubble labeled 'Labor Sub Tab'. A 'Select Planned Labor' dialog box is open, showing a table of labor entries:

Task	Labor	Name	Craft	Skill Level	Vendor	Contract	Hours	Rate
<input type="checkbox"/>	MECH	APPRENTICE					2:00	16.50
<input type="checkbox"/>	MECH	FIRSTCLASS					2:00	25.00
<input type="checkbox"/>	ELECT	FIRSTCLASS					2:00	22.00

At the bottom of the interface, the 'Planned Labor' section is shown. A red box highlights the 'Select Planned Labor' button, with a callout bubble labeled 'Planned Labor'.

3.3.1. APPLYING LABOR WHEN NOT COPYING PLANNED LABOR

The user also has the ability to apply labor charges without the aid of copying preloaded Work Plan entries. In many cases, copying the planned labor components would be only marginally helpful, since the craft entry and the estimated elapsed times would likely require adjustment. To enter new Labor rows, the User should follow these steps.

First, click the **New Row** button located under the Labor Actuals sub tab.

The User must then populate all Required Fields (*). To populate the Labor Code field, Users can either type in a Labor Code or use one of the Select Options associated with the field.

Once the User clicks on the Save button, the entry will be permanently attached to the Labor sub tab.

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The screenshot displays the Maximo Work Management interface. At the top, there is a navigation bar with tabs: List, Work Order, Plans, Related Records, **Actuals**, Safety Plan, Log, Failure Reporting, and Specifications. Below this, the 'Work Order' tab is active, showing details for Work Order 1009, '12 Month Service on Shipping Dept #2 Conveyor', Site BEDFORD, and Status APPR. A 'Children of Work Order 1009' section shows a list of tasks. A callout 'Labor Sub Tab' points to the 'Labor' tab in the 'Tasks for Work Order 1009' section. Another callout 'Expanded Screen Labor Data Input' points to the expanded labor entry form. This form includes fields for Task, Labor, Name, Approved?, Start Date, Start Time, End Time, Regular Hours, and Rate. Below these are sections for 'Details' (Craft, Skill Level, Start Date, Start Time, End Date, End Time, Regular Hours, Rate, Type, Timer Status), 'Outside Labor' (Outside?, Vendor, Contract, Revision), 'Premium Pay' (Premium Pay Code, Premium Pay Hours, Premium Pay Rate, Premium Rate Type), and 'Charge Information' (GL D, GL Cr, Asset, Memo, Recorded as Received). A 'New Row' button is highlighted with a red box and a callout 'New Row Button'.

3.3.2 TASK ID

An optional field, which designates the specific task against which time is recorded.

3.3.3 LABOR CODE

The actual resource person that should be charged to the Work Order. Upon entry, the pay rate, craft, qualification and outside information will be transferred from the data previously entered on that Labor record. If an employee has multiple craft designations, Users will be prompted to select the correct craft entry for this row.

3.3.4 START DATE

The System will initially default the Start field to the current (entry) date, but if the Work was initiated on an earlier date, an adjustment to the date should be made. Users can employ the date shortcuts (Ctrl+minus and Ctrl+plus) to adjust the dates.

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3.3.5 START TIME/END TIME

(Optional) If your Organization requires entry of the time of day, enter the start and end time values. The duration between those time intervals will populate the Hours field automatically, but the duration field can be subsequently adjusted for lunch breaks, etc.

3.3.6 HOURS

The total time charged to the Work Order by this resource should be entered here. This might include not only wrench time, or also be inclusive of associated time to procure materials, check maintenance specs and transit time. Hours can be entered using the format 2:30 or 2.5 (which the system will convert to 2:30).

3.3.7 OVERTIME AND OT SCALE

If your Business Process supports the use of Overtime (OT) multipliers, add the appropriate number of hours in the Overtime field. The OT Scale will default from the value used on the Labor record. If the default scale value is not correct, select a different overtime multiplier to enter the correct amount.

3.3.8 TRANS TYPE

WORK is the default value for this field - as Maximo 7 is generally charged with capturing labor hours associated with Work Order activities. Your Organization may choose to track separately other work categories such as planning, part procurement and transit and/or capture non-work (overhead) activities such as meetings and training. The labor transaction type field contains the following pre-loaded values: Travel Time, Waiting Materials and Work. Other indirect labor values can be added to support your data mining efforts.

3.3.9 DEBIT GL ACCOUNT

If General Ledger accounts are utilized in Maximo 7, this field should already be partially or fully populated with the value from the GL Account field on the Work Order main screen. (The Work Order GL value may be derived from the Location record's GL Account or in certain instances from the Asset or PM record). GL account fields are built in segments. After selecting the first accounting segment, Users will see the available matching segments for the second segment. And so on.

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The screenshot shows the Maximo Work Management interface. The 'Labor' tab is active, displaying a list of labor tasks. A 'Select GL Account' dialog box is open, showing the 'GL Account' field with the value '6220 - 300 - ??? - ??????????'. The 'Segment' is set to 'RESOURCE'. The dialog box also displays a table of 'GL Component Value' and 'Description'.

GL Component Value	Description
000	General
200	Item
300	Labor
350	Contract Labor
400	Tool
450	Leased Tool
SAF	Safety
SUP	Supervisor

The 'Debit Account' field is highlighted with a red box.

4 APPLYING MATERIAL UTILIZING PLANNED MATERIAL

Work Plans associated with a Work Order can also be used to apply Material charges to that Work Order. To do so, the user should follow these steps.

First click on the **Select Reserved Items** button located on the Materials Actuals sub tab.

The User will be then be given all Planned Item entries associated with that Work Order that were to be issued from a Storeroom. The User can then click the checkbox on individual rows or the top row to select all rows. The user must then click the **OK button** to return to the Work Order screen with the Item Number (if used), Item Description, Unit of Issue, Quantity, Unit Cost, and Total Cost. (Note: Planned Materials which do not reference a Part ID in the Maximo 7 database are Direct Issue items and may also be received through the Purchasing applications in Maximo 7.)

In order to edit or augment the carried over information, the User must click on the **Select button** located at the left margin of each row. This will expand the row detail so that updated information can be entered. After all information has been updated on the pull down screen, the user must click the **Save button** to update the Maximo Record.

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The screenshot displays the Maximo Work Management interface. At the top, the 'Work Order Tracking' header is visible. Below it, a navigation bar includes tabs for 'List', 'Work Order', 'Plans', 'Related Records', 'Actuals', 'Safety Plan', 'Log', 'Failure Reporting', and 'Specifications'. The 'Actuals' tab is selected. The main area shows details for Work Order 1009, including the description '12 Month Service on Shipping Dept #2 Convey', Site 'BEDFORD', and Status 'APPR'. A 'Children of Work Order 1009' section is visible, showing a list of tasks. A 'Select Reserved Items' dialog box is open, displaying a table of items with columns for 'Task', 'Request Item', 'Storeroom', 'Description', and 'Quantity Reserved'. The table lists several items, including '4-2100 CENTRAL Washer, 1/2 In', '217224 CENTRAL Cam, 1 In Dia Shaft', '217215 CENTRAL Bearing, Pillow Block, Fafnir- 1 In ID', '60-051 CENTRAL Pin, Split- E-43', '217219 CENTRAL Plate, Chrome Plated', and '900810 CENTRAL Lubricator Assembly'. A callout bubble points to the 'Select Reserved Items' button at the bottom of the dialog box. The 'Materials' tab in the main interface is also highlighted with a red box.

Task	Request Item	Storeroom	Description	Quantity Reserved
<input checked="" type="checkbox"/>	10 1134	4-2100	CENTRAL Washer, 1/2 In	12.00
<input checked="" type="checkbox"/>	10 1137	217224	CENTRAL Cam, 1 In Dia Shaft	2.00
<input checked="" type="checkbox"/>	10 1135	217215	CENTRAL Bearing, Pillow Block, Fafnir- 1 In ID	4.00
<input checked="" type="checkbox"/>	10 1138	60-051	CENTRAL Pin, Split- E-43	3.00
<input checked="" type="checkbox"/>	10 1136	217219	CENTRAL Plate, Chrome Plated	4.00
<input checked="" type="checkbox"/>	10 1139	900810	CENTRAL Lubricator Assembly	1.00

5 APPLYING MATERIAL WHEN NOT COPYING PLANNED MATERIAL

The User also has the ability to apply Material charges without the aid of copying associated Work Plans. To do so, the user must follow these steps.

6.1 First, the user must click the **New Row** button located under the Materials Actuals sub tab.

6.2 The user must then populate all Required Fields (*). Information about a selected piece of material can either be typed in or be populated by the system once an Item Number has been provided. The Item number itself can either be typed in or selected through one of the select options provided.

6.3 Once the user clicks on the Save button, a row will be committed under the Material sub tab and the details section will roll up to return the User to the table window format.

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The screenshot displays the Maximo Work Management interface. At the top, there are tabs for List, Work Order, Plans, Related Records, **Actuals**, Safety Plan, Log, Failure Reporting, and Specifications. Below these, the Work Order number is 1009, and the description is "12 Month Service on Shipping Dept #2 Conveyor". The Site is BEDFORD, and the Status is APPR.

The "Children of Work Order 1009" section shows a list of tasks. A callout bubble labeled "Material Sub Tab" points to the "Materials" tab in the "Labor" section. Another callout bubble labeled "Expanded Screen Material Data Input" points to the expanded details for the material line item 117084.

The expanded screen shows the following details:

- Task:** 117084, Description: Shaft- 1 Inch Dia
- Line Type:** Item
- Storeroom:** CENTRAL
- Site:** BEDFORD
- Quantity:** 1.00
- Unit Cost:** 27.00
- Line Cost:** 27.00
- Bin:** C-6-2
- Lot:**
- Expiration Date:**
- Lot Type:** NOLOT
- Condition Code:**
- Rate Percentage:**
- Condition Enabled?**
- Stock Category:** STK
- Entered By:** MAXIMO
- Actual Date:** 12/11/01 2:55 PM

The "Charge Information" section shows:

- Requisition:**
- Requisition Line:**
- Location:** SHIPPING, Shipping and Receiving Department
- Asset:** 12700, Conveyor System #2
- Rotating Asset:**
- GL Debit Account:** 6500-300-200
- GL Credit Account:** 6600-800-800
- Transaction Type:** ISSUE
- Outside?**
- Issued To:**

6 PRIMARY COMPONENT FIELDS

6.1 ITEM

Enter the Part ID charged to this Work Order. Leave this field blank if you would like to charge Parts (to the Work Order) that are not in the Inventory database and do not have an Item record number.

6.2 DESCRIPTION

When the Item field is populated, this will default to the description of the corresponding Item number as created in the Inventory database. To create a Materials charge for Parts not registered in the database, enter information into the Description field without having entered a Part number. Maximo 7 will recognize that this cost does not represent the issue of a previously created Item from a Storeroom.

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6.3 STOREROOM

This field references the source of the Part which was issued. The Storeroom field will remain blank when there is a material charge that does not denote a Part in the Maximo 7 database. If a Storeroom value is not populated, the User must enter a Work Order number, Location, Asset or GL Account, so that the Materials expense is correctly captured.

6.4 DEBIT GL ACCOUNT

This field should already be correctly populated, or at least partially populated with the value from the GL Account field on the Work Order main screen. (The Work Order screen value is derived from the default GL Account brought over from the Location or in infrequent instances from the Asset or PM record).

7 APPLYING TOOLS

If tool usage has been planned and utilized, the user can follow the same procedures described in the Materials sub tab to report this usage in the Tools sub tab.

The screenshot displays the Maximo Work Order Tracking interface. The main window shows the 'Tools' sub-tab for Work Order 1009. A dialog box titled 'Select Planned Tools' is open, showing a table of tools to be selected.

Task	Tool	Description	Tool Hours	Rate
<input type="checkbox"/>	GREASE	GREASE GUN	4.00	1.50
<input type="checkbox"/>	METER	SIMPSON VOLT/OHMETER	4.00	2.50

The background interface shows the 'Tasks for Work Order 1009' table with columns: Sequence, Task, Summary, Estimated Duration, and Status. The 'Tools' sub-tab is active, and the 'Select Planned Tools' dialog box is open, allowing the user to select tools for the work order.

8 APPLYING FAILURE INFORMATION

If the Work Order constitutes a failure event, complete the Cause and Remedy fields on the Failure Reporting tab.

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The screenshot displays the Maximo Work Order Tracking application. At the top, there's a 'Work Order Tracking' header with a 'Return' link and the IBM logo. Below this is a search bar with 'Find:' and a 'Select Action' dropdown. A navigation bar includes tabs for List, Work Order, Plans, Related Records, Actuals, Safety Plan, Log, Failure Reporting (active), and Specifications. The main area shows a Work Order for '1009' with a description '12 Month Service on Shipping Dept #2 Convey', Site 'BEDFORD', and Status 'APPR'. Below this is the 'Failure Details' section, which includes fields for Failure Class (PKG), Packaging Line Failures, Remarks, Failed Date (7/3/08 6:28 PM), and Remark Date. A 'Failure Codes' table is also present, showing three entries: PROBLEM (LIFT, Lift and Filling System), CAUSE (SPILL, Carton Spillage), and REMEDY (TIMING, Adjusted Timing of Lifter). A 'Select Failure Codes' button is at the bottom right.

Type	Failure Code	Description
PROBLEM	LIFT	Lift and Filling System
CAUSE	SPILL	Carton Spillage
REMEDY	TIMING	Adjusted Timing of Lifter

9 REPORTING DOWNTIME

Downtime can be recorded in the Maximo Work Order applications. An illustration of the Downtime dialog box is shown below. Users can access this dialog box by clicking on the **Select Actions** options menu and then selecting Report Downtime from the options list. There are two methods of reporting downtime in Maximo. Users can change the status of the Asset involved from *Down* to *Up* and then later reverse the status change of the Asset back to *Up*. This is done using the Change Status radio button. The difference in the two times recorded will be calculated as the Hours total. If the asset is attached to a calendar, then only the operating time between those two time points will be accumulated. Downtime can be recorded more than once against the same Work Order. For example, the Craftsperson may have taken the Asset off line one hour before its daily production shift ended. The work went on for four more hours before the Asset was restored to an operating state. Thus, the User would record one hour of Operational downtime and then post a second event to record the four hours of Non-Operational downtime.

The downtime hours total can be viewed from the Work Order record or from the Asset record itself. Maximo will add any recorded downtime hours to the Assets total downtime field located on the lower right side of the Asset screen. By accessing the **Select Actions** menu options, Users can view the dates and times for each downtime event. There will be two rows for each event, one for the Stop time and the other for the Restart time (even if the downtime was recorded as a single event – see below).

The other method for reporting downtime is to make a single transaction after the Asset has been brought back on line. If not already activated, click the **Report Downtime radio button** entering both the start and ending times.

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Work Order Tracking

Find:

List Work Order Plans Related

Work Order: 1158
Location: BR430
Asset: 11430
Parent WO:
Classification:
Description:

Job Details

Job Plan:
PM:
Safety Plan:
Contract:

Scheduling Information

Target Start:
Target Finish:
Scheduled Start:
Scheduled Finish:

Responsibility

Reported By: SMITH
Reported Date: 3/12/07 12:00 AM
On Behalf Of:
Phone: (617) 375-8855

Report Downtime

To change the asset's current status from UP to DOWN or DOWN to UP, select Change Status. To record the start and end of the asset's downtime, which leaves the asset in its current status, select Report Downtime.

Asset: 11430
Asset Up? Y

Downtime Report

☐ Change Status
☒ Report Downtime

Status Date:
Downtime Code:
Start Date: 3/12/07 12:00 AM
End Date: 3/14/07 8:40 AM
Hours: 32:00
Downtime Code: BRKDOWN

Start Date Default:
Downtime Type:
Reported Date
Actual Start Date
None

Operational
Non-operational

OK Cancel

Select Value

Filter: 1 - 4 of 4
Download: ?

Value	Description
ADJUST	Downtime Code
BRKDOWN	Downtime Code
MINRSTOP	Downtime Code
SETUP	Downtime Code

Cancel

Attachments

Status: WAPPR
Status Date: 3/12/07 12:00 AM

If the reported date radio button is activated, the Work Order creation date will populate as a default in the Start Time. If the Actual Start Date radio button is on, the Start Date will appear as the time that the Work Order first reached a status of INPRG or higher. If the NONE radio button is active, then no defaults will appear and the User must enter the Start Date as well as the End Date. The date fields can be edited by the User if they are not accurate as inserted.

10 ROUTES

Although routes are covered in the Work Order Planning course, users may find it expeditious to create a route to record a series of events as a singular event. For example, it may be easier to generate one Work Order to PM all exhaust fans or all air handlers on the roof of the same building. Routes can also be used to provide direction for a weekly lubrication route, or any set of events that could easily be treated in a singular fashion. Routes can create a single Work Order, or a hierarchy of parent and child Work Orders, depending upon the selection made regarding the Route Stop configuration.

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Routes

Bullets: (0) Go To List Reports Start Center Profile Sign Out Help

Find: Select Action

List Route

Route: 1002 Inspect Fire Extinguishers

Site: BEDFORD

Attachments

Route Stops Inherit Status Changes? ☒

When this Route is applied to a Work Order, the Route Stops will become:

☒ Child Work Orders

☐ Entries in the Work Order's Multi Asset, Location and CI Table

☐ Work Order Tasks

Route Stops

Sequence	Location	Asset	Asset/Location Description	Job Plan
10		1001	Fire Extinguisher	INS1002
20		1002	Fire Extinguisher	INS1002
30		1003	Fire Extinguisher	INS1002
40		1004	Fire Extinguisher	INS1002
50		1005	Fire Extinguisher	INS1002
60		1006	Fire Extinguisher	INS1002
70		1007	Fire Extinguisher	INS1002

Select Assets Select Locations New Row

11 REVIEW QUESTIONS

- From the Work Order Tracking application, locate the Work Order that you constructed from an incident of your own choosing (Exercise #2 at the end of the prior Chapter). If you have difficulty locating the record, try searching for a value that you remember entering in one of the Work Order fields, or by your login name, which will be automatically populated in the Reported By field upon insert. (Note: To further refine your search, you could also enter a date range in the Reported Date field (in addition to your login) and extract a list of your own work orders for the past X days.) After locating your Work Order, go to the Actuals tab. At the bottom of the screen, click the Planned Labor button and you will see the estimate(s) of labor that you built in the previous exercise. Highlight the left column box, click the **OK button** and you will return to the Actuals Labor tab with the value. To edit the estimated hours (to match the actual hours worked), click the arrow at the far left of the column of the row, which will explode out into a detail screen for the row selected. Change the hours charged field to an amount 15 minutes less than the estimate. If the Labor record is a Craft, edit that field as well, to change the reference from a Craft record to an individual.
- As in the preceding question, locate the Work Order that you selected from a list of Waiting for Approval Work Orders in Exercise 3 of the preceding Chapter. Did you remember to write down the number? Then go to the Actuals tab and copy the planned labor to the Actuals screen, using the Select Planned Labor button. What happened? If necessary, follow the error message instructions, and then complete the suggested task to be able to charge actual labor and materials to the Work Order. Add a new row to the Labor Actuals to record that an additional employee who assisted in the work. Finally, click on the Failure Reporting tab. Check the various levels to see if you can

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supplement additional information for future historical reference. If no accurate value exists for the third and fourth Failure Classification levels, leave the fields blank.

- From the Work Order Tracking, create a new Work Order to replace a damaged traffic sign. Enter the actual charges for labor and materials. Note that if you entered the Work Order in Quick Reporting, the initial status of a Work Order in Quick Reporting is 'INPRG' – In Progress, a status that is already past the Approval status level; thus, you can enter actual charges without having to change the Work Order status. Finally, complete the information on the Failure Reporting tab and change the status of the Work Order to *COMP* – Complete. This last step will make it clear to all users that the work process has been completed, so that it is not rescheduled as a subsequent work assignment.