



# Forecaster

## Application User Guide

Version 24.x  
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## Overview

Forecaster is a batch process in M5 that predicts when a standard job is due for a unit, department, or component based on defined usage intervals and system data. Forecaster takes the when of the Standard Job MCC and the how of the Standard Job Tech Spec to create future work requests.

The date is calculated based on time intervals, primary meter usage, secondary meter usage, and fuel consumption.

All standard job information must be set up prior to running the forecaster program to generate work requests with the desired information.

## Assumptions

1. Units, components, and departments you want to include in forecasts are properly set up and configured in M5.
2. MCC's (maintenance class codes) and Tech Specs for which you want to set up standard job data are properly set up and configured in M5.
3. A proper review of your organization's business needs and how certain system settings, like flags and privileges, may impact forecast outcomes has taken place.
4. Users who will be configuring the standard jobs and running the batch program have been given proper access and sufficient system privileges to use the necessary frames in M5.
5. Usage data in your M5 system is up to date and accurate to ensure the program will produce accurate forecasts.

## Understanding the Calculation

The primary purpose of forecaster is to accurately predict when a standard job is due. As mentioned above, the forecaster bases its calculation on the unit's primary meter usage, secondary meter usage, fuel usage, or a time interval. The forecaster will use the earliest date calculated from these intervals to establish a due date for when a standard job should be done next.

Usage and fuel due dates are calculated based on the usage or fuel used during the current and two preceding periods. The process determines the usage at the beginning of this time frame, and the latest date of any usage update.

**⚠ Important:** The configuration of System Flags 2159 and 5269 can affect this calculation. Please review the section titled [System Flags](#) for more information.

$$\text{Usage per day} = \frac{\text{Total usage for the current period} + \text{previous two periods}}{\text{\# of days between first day two periods ago and today's date}}$$

For example, say today's date is August 23:

Usage for June = 200 hours

Usage for July = 225 hours

Usage through August 23 = 175 hours

**Total Usage = 600 hours**

# of days in June = 30

# of days in July = 31

# of days in August so far = 23

Total number of days = 84 days

600 hours / 84 days = 7.14 hours/day

If the PM is due every 150 hours or 90 days and the last PM was done on August 2nd, the next forecasted due date would be the earliest of:

August 2nd + 90 days = October 31

OR


150 hours / 7.14 hours per day = 21.01 days, so add 21 days to August 2nd and results in August 23rd, which would be the next forecast for this PM.

If the forecaster cannot find usage in the previous two periods and there is only usage in the current period and/or previous period, then the forecaster will only use the current period's usage and/or previous period and divide that by the current period's and/or previous period's number of days to arrive at an average usage per day.

The unit's MCC has a "Max usage" number, representing the maximum expected usage for a month. If the calculated usage-per-day exceeds this value divided by 30 (the typical number of days in a month), the usage calculation is ignored, and the job is not forecast based on usage.

# 1. Setup and Configuration

## System Flags

 **Important:** Your organization should review the following list of system flags to ensure they are configured in the way that best fits your business needs.

Changes to flag settings can cause major changes and discrepancies between forecasts.

The M5 application contains hundreds of system flags. It is possible there are flags not listed below that could have an indirect impact on forecaster functionality. For a comprehensive list of M5 system flags, please refer to the System Flags Table guide.

### **1180 – Base Forecasts on In-Service Date? (Y/N)**

If the flag is set to "Y", the system uses the unit's in-service date, rather than its acquisition date, as the basis for establishing a unit's first work requests.

Additionally, if a forecasting "First" date is set for a unit on the Standard Job Unit/Dept or the Standard Job MCC frame, the forecaster uses this date, instead of the acquisition date or in-service date, as the basis for its forecasting.

This was put in place so customers could establish unit specific dates for job forecasting that do not coincide either with the acquisition or in-service dates such as an emissions service that does not need to be done for the first five years but is done annually from that point.

### **1218 – Include Components in Job Forecasting? (Y/N)**

If this flag is set to 'Y', the forecaster program will include components in addition to units and departments in the batch process. 'N' is the default value.

### **1325 – Usage Spreading in Use? (Y/N)**

If this flag is set to 'Y', then usage is spread among periods between the previous meter reading and the current meter reading.

For example, if the meter is 1000 on November 25 and a new meter of 1150 comes in on December 10, ordinarily M5 would put all 150 in December's history. Setting the flag to 'Y' will cause 2/3 of the usage (10 days of the 15) to push into December, or 100, and 1/3 of the usage (5 days) into November, or 50.

- ❗ **Alert:** This is an effective way to improve the Average Usage figure for purposes of forecasting. However, you should not use this flag when billing usage based on the “Unit History” method on the billing code, as usage could be spread into already-billed periods and never billed.

### **2001 – Consider a Job Done at Acquisition/In-Service Date/First Time Date When Forecasting?**

- If ‘Y’, the job is considered done as of the job’s “first time” and the next job will be due from the “first time” plus the interval.
- If ‘N’, the job is not considered done as of the job’s “first time” and the job will be forecast to be due on the “first time” date.

This flag advises M5 to consider the most current of the above dates as the last completed date for standard jobs in the forecaster process.

The default for this flag is "Y". This flag is particularly important for absolute jobs as this flag tells forecaster if the job should be considered done on this date or should it be forecasted from this date.

For example, if a unit's standard job's "first time" is 01-jul-2018, with a time interval of six months, if the flag is "N" then the job will be due on 01-jul-2018, and if the flag is "Y" then the job will be due on 01-jan-2019.

### **2051 – Minimum Number of Days since Meter/Fuel Activity**

If set to a number greater than zero, then the forecaster will not attempt to forecast based on usage unless the unit has had a meter reading within that many days.

If the flag is set to the value of 9999, then no usage-based forecasting is done for any unit. Only time is used to determine if a job is due. This flag is especially useful for those customers who have units with erratic meter readings.

### **2159 – Days to Look Back in Meter Journal for Usage Forecasting**

If this is blank or zero, the last three periods in the unit history table are used to calculate average-use-per-day for the forecaster. Otherwise, the forecaster looks this many days back from the most recent meter reading, subtracts the usage reading just before that from the most recent reading, and divides that number by the number of days between.

This flag defaults to blank (or zero) so that the forecaster behaves the same as prior to the introduction of this flag. A good figure to set the flag to is "90". Flag 5269 does the same thing for fuel forecasting.

### **2061 – Schedule Events – Forecaster to Skip Certain Dates (0,1,2,3)**



This flag schedules events, including forecaster, so that the events skip certain dates depending on the value of the flag: 0 = skip none, 1 = skip weekends, 2 = skip holidays, 3 = skip weekends and holidays. If a day is skipped the due date becomes the following day.

### 5171 – Convert Absolute Day Intervals to Months (Forecaster)? (Y/N)

Set this to Y to convert 30 day intervals to 1 month or 365 days to 12 months, and such. The following table is a full breakdown.


Days	Months
30, 31	1
60, 61	2
90, 91	3
120, 121	4
150, 152	5
180, 182	6
210, 212	7
240, 242	8
270, 273	9
300, 303	10
330, 333	11
360, 364, 365, 366	12
450, 456	15
540, 548	18
630, 639	21
720, 730	24
810, 821	27
900, 912	30
990, 1004	33
1080, 1095	36
1170, 1186	39
1260, 1278	42
1350, 1369	45
1440, 1460	48

Days	Months
1530, 1551	51
1620, 1642	54
1710, 1734	57
1800, 1825	60

### **5269 – Days to Look Back in Fuel Charges for Fuel Forecasting**

If this is blank or zero, the last three periods in the unit history table are used to calculate average-fuel-per-day for the forecaster. Otherwise, the forecaster looks this number of days back from the most recent fueling date, finds the fueling before that point, sums the fuel quantity after (but not including) that date, and divides that total by the number of days between.

This flag defaults to blank (or zero) so that the forecaster behaves the same as prior to the introduction of this flag. A good figure to set the flag to is "90". System Flag 2159 does the same thing for usage forecasting.

 **Warning:** This flag causes the forecaster to run significantly slower.

### **5270 – Consider a Job Done at First-Time Usage when Forecasting? (Y/N)**

If this flag is set to 'N', the first occurrence will be due on the standard job's first-usage.

If it is set to 'Y', the first occurrence will be due on the standard job's first-usage plus its usage interval. The default value is 'Y' to preserve existing behavior.

## Unit Status Codes

Unit Status Codes are an important factor in helping the forecaster batch process decide which units to forecast work requests for.

For example, your organization may only want to forecast for active units and have the program ignore units that are out of service or in the process of being disposed.

This frame allows you to designate each unit status code with a 'Yes' or 'No' value in the Forecaster dropdown.

If the flag is set to 'Yes', units with that status code will be eligible to have work requests generated when the program runs.

'No' will cause the program to ignore units with that status code.

SAVE
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REFRESH
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### Unit Status Codes

Codes (Loaded 13 records)

Status Code	Label	Description2	Trigger Field	Disposal Status?	Work Orders	Work Request	Forecaster	Reports	Capital	Allow Sales Info
A	Active	Active Unit	In-service Date	No	Yes	Yes	Yes	Yes	Yes	No
B	Budgeted	Budgeted	Unit Purchase Request - Add New Unit No	Yes	Yes	Yes	No	Yes	Yes	No
D	Flag	Flagged for disposal	Unit Disposal - Disposal Status	Yes	Yes	Yes	Yes	Yes	Yes	No
F	Final	Finalized /Unit to be Auctio	Unit Disposal - Disposal Status	Yes	No	No	Yes	Yes	No	Yes
I	Inactive	Ready unit for service/Inactiv	Acquisition Date	No	Yes	Yes	No	Yes	Yes	No
J	Auction/Junked	Unit at auction2B/replaced	Unit Disposal - Disposal Status	Yes	No	No	No	No	No	Yes
O	Ordered	On order	Unit Purchase Request - Purchase Order	No	Yes	Yes	No	Yes	Yes	No
P	Pending	Pending Unit		Yes	No	No	Yes	Yes	No	No
R	RedeDecommissio	Redeploy unit /Ready for sale	Unit Disposal - Disposal Status	Yes	Yes	Yes	Yes	Yes	No	No
S	Sold (Default)	Sold/Disposed unit (translate)	Unit Disposal - Disposal Status	Yes	No	No	No	No	No	Yes
T	Totaled	Unit is totaled	UNIT DISPOSAL - DISPOSAL STATUS	Yes	No	No	No	No	No	No
W	Storage/Prep	Prep Unit for Sale	Unit Disposal - Disposal Status	Yes	No	No	Yes	Yes	Yes	No
X	Out of Service	Spare or backup	Unit Disposal - Disposal Status	Yes	No	No	Yes	No	Yes	No

## Maintenance Class Codes (MCCs)

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### MCC Main

**Maintenance Class Code**

Code:  Description:  Disabled:

**Monthly Expected Usage**

Type	Min Usage	Max Usage	Length
First:			
<input type="text" value="Mile"/> ▾	<input type="text" value="1"/>	<input type="text" value="999999"/>	<input type="text" value="10"/>
Second:			
<input type="text" value="Hour"/> ▾	<input type="text" value="1"/>	<input type="text" value="999999"/>	<input type="text" value="10"/>

**Season**

Season Code:  Description:

Season Start:  Season End:

The Maintenance Class Code (MCC) is used to establish and assign preventive maintenance intervals and set expected monthly use for meter validations on units and components.

A maintenance class code defines a group of units that are similar in their maintenance scheduling requirements, have the same meter type, the same expected monthly usage and same seasonality although each may have different physical characteristics. Within each MCC the user can define work-scheduling criteria used by the forecaster program such as seasonal use, meter type and maximum expected usage per month.

All units must have an MCC assigned, but the only requirement for an MCC is to create a code and assign a description to the code. However, in order to validate meters and use the Forecaster, the user must set up the Monthly Expected Usage parameters.

The length field determines when a mile, kilometer or hour reading will turn over the odometer.

The season code is used by organizations that have units that are used during certain seasons within the year (for example, plows, deicer and mowers).

An MCC can be assigned to a unit on the Asset/Codes tab of Unit Main or to a component on Component Main in the Component Codes section.

The MCC is independent of all other asset codes. Units with different activities and classifications can be assigned to the same MCC.

Within each MCC the user can define work-scheduling criteria used by the Forecaster program such as seasonal use, meter type and maximum expected usage per month.

MCC's are also used in setting up Standard Job intervals and assigning jobs. All units with the same MCC will be on the same service cycle and have the same standard jobs assigned.

## Standard Job – MCC

The maintenance class code (MCC) groups units, departments, and components by their maintenance schedules. At the time the user sets up the MCC, M5 does not know what it will be used for, so it is important to remember assigning an MCC to a unit, department, or component for the first time, they will need to be manually populated with last done information or first-time criteria on the [Standard Jobs – Unit/Dept/Comp](#) frame. Refer to this section for more detail.

Special considerations need to be taken for Departments and Components as they have no in-service or acquisition date, first-time criteria must be set in order for the forecaster to have a starting point. Also, departments and components have no meters so only time intervals have any relevance.

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### Standard Job MCC

Job / MCC

Job Code:

MCC:

+
Schedule
Forecaster
Loc Override
Subjobs

**Recurring Interval**

Time:  Day(s)

Primary Meter:  Usage

Secondary Meter:  Usage

Fuel Consumption:

Earliest Deviation:  %

Latest Deviation:  %

Delay parent job while this one is on a WO:

**First Time Criteria**

Earliest Date:

Primary Meter:  Usage

Secondary Meter:  Usage

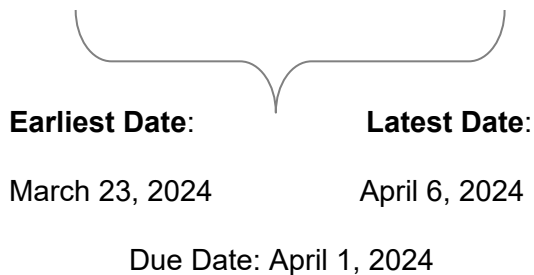
To set up a standard job:

- 1) Open the Standard Job MCC frame.
- 2) Select the proper work accomplished code, system and component code from the LOV. The job description will now display after tabbing off the field.
- 3) Enter the MCC in the MCC field or use the LOV of the Standard Job MCC frame to select an MCC. The system retrieves and displays the maintenance class code description.

4) **Schedule tab:**

- a. Enter the time and/or primary/secondary meter/fuel consumption fields as intervals as to when the job should be performed to the unit.
- b. The earliest and latest deviation % fields are used to indicate the standard job can be performed within a date range on either side of the due date. The fields determine the “earliest date” and “latest date” on the work request as a window surrounding the due date. If a job should never be done late, the latest deviation % should be set to 0%. See the example below of deviation %.

- a. Interval: Every 90 days
- b. Last Completed Date: January 1, 2024
- c. Earliest Deviation Percentage: 10%
- d. Latest Deviation Percentage: 5%



- c. If the user would like to enter an earliest date/primary meter/secondary meter under the first-time criteria section, this will populate all units with this MCC and standard job. This information is particularly important for absolute jobs.

### 5) Forecaster tab:

- a. Scheduling Basis. Users can schedule a job as an absolute job or relative job. A more in-depth explanation of the difference between the two can be found in the section titled [Setting Up a Job Schedule \(Absolute vs. Relative\)](#).
- b. Recurring job. If the user would like this job to be done throughout its life, then the checkbox should be selected. If the job should only be forecasted once, the checkbox should be cleared.
- c. Seasonal Restrictions - If the unit has only seasonal use and the job should only be done within certain months/periods of the year then this should be used. The choices are None, In MCC Season, and Out of MCC Season. The season is entered as a month and day. If the forecaster predicts that a job will be due at a time when the seasonal restriction says it cannot be done, the occurrence is skipped. For example, if the time interval is three months, today is September 15, the job is due on October 1, the MCC says to do the job "Out of MCC Season" and the season is set as September 1 to November 1, then the October 1 occurrence is skipped and the job is set to be due three months from then on January 1. There is a rule that if the job was forecasted to be due today, and it does not conflict with the season, then the job will be kept with the original due date to be due. If the job still conflicts, it will be skipped.
- d. Maintain Intervals in Cycle - The interval difference between each job is held constant. For example, a unit has a PM cycle of A, B, and C, where the A job is due every 10,000 miles, the B job is due every 20,000, and the C job every 40,000. If the A job is done at 10,500 instead of 10,000, the interval is still maintained. So the B job would be due at 20,500 and the C job would be due at 40,500. This functionality only applies to relative jobs.
  - ❗ This checkbox should only be used or selected when implementing **usage** intervals. It is not to be used with **time** intervals.
- e. Push Next Occurrence to the End of the Month - If this checkbox is selected, the next due date will be determined as if the job was done at the end of the month in which it was completed. So if a job was done on March 1st and the cycle for the job is 6 months, the next time the job would be due is September 30th and not September 1st. This only applies to relative jobs.
- f. Job Defaults. The job reason and priority are required and will be used for the work request. The location code will default the MCC and job to that location/visit reason and priority code if used.

## 6) **Loc Override tab**

Enter in the Maintenance location that the work is to be performed at and the location it can be overridden. The rules are as follows:

- a. If a maintenance location is entered on the Forecaster tab for the standard job, and the override value specified matches the unit's maintenance location, use the override value. The result would be the same if no maintenance location was specified on the standard job since the override value takes precedence.
- b. If a maintenance location is entered on the Forecaster tab for the standard job, and the override value specified does not match the unit's maintenance location, use the maintenance location specified on the standard job. The result would be the same if no override value was specified.
- c. If no maintenance location is entered on the Forecaster tab for the standard job, and there is no override value that matches the unit's maintenance location, the unit's maintenance location will be the location on the generated work request. The result would be the same if no override value was specified and no maintenance location exists on the standard job.

## 7) **Subjobs tab**

- a. If the user chooses to include a sub-job to be completed during the parent job's scheduling this must be completed. Enter the sub-job and description. Then enter the elimination % of this job's interval that will be included in the parent job and whose work request will be eliminated based on the setup.
- b. On the Included Sub Jobs section, enter the code for the sub job. If another sub job exists, it should not be listed here as it is likely already included in the other sub job. Do not list 2 sub jobs that are associated because this could cause looping of your included jobs. For example, if a C job includes a B job, and a B job includes an A job, do not include the A job in the C job. The Elimination % advises the forecaster to eliminate a separate iteration of this sub job if its due date falls within this percentage of the total interval. The reset flag is not used.



## Standard Jobs – Unit/Dept/Comp

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### Standard Job Unit/Dept/Comp

Unit / Dept / Component

Number

Job Code:

+
Schedule
Forecaster
History
Subjobs

**Recurring Interval**

Time:  Day(s)

Primary Meter:  Usage

Secondary Meter:  Usage

Fuel Consumption:

Earliest Deviation:  %

Latest Deviation:  %

Delay parent job while this one is on a WO:

**First Time Criteria**

Earliest Date:

Primary Meter:  Usage

Secondary Meter:  Usage

Standard jobs that are specific to a unit and not the MCC should be set up individually at the standard job unit level (standard jobs for departments and components are also permitted). This frame should also be used to view and modify standard jobs that were setup at the MCC level, as discussed in the [Standard Jobs – MCC](#) section above.

If the job was inherited from the MCC, only the first-time and last-done information may be changed. All other information, including the intervals and list of sub jobs, is locked (read-only).

- 1) Open the Standard Job Unit frame.
- 2) Enter the unit number.
- 3) Select the proper work accomplished code, system and component code from the LOV. For example, 01-PM-022. The job description will now display after tabbing off the field.
- 4) **Schedule tab**
  - a. Time/Primary Meter/Secondary Meter/Fuel Consumption - Same rules apply as being set at the MCC level.
  - b. Earliest/Latest Deviation - Same rules apply as being set at the MCC level.

- c. An earliest date/primary meter/secondary meter can be verified/modified under the First Time Criteria section.

5) **Forecaster tab**

- a. Scheduling Basis-Same rules apply as being set at the MCC level.
- b. Recurring job-Same rules apply as being set at the MCC level.
- c. Seasonal Restrictions-Same rules apply as being set at the MCC level.
- d. Job Defaults-Same rules apply as being set at the MCC level.
- e. **View Forecaster Statistics-** By selecting the “View Forecaster Statistics” link at the bottom of the frame, the details of the last forecast will be presented. This frame is useful for figuring out why the forecaster picked the due date that it did, or if the forecaster did not create a work request, or why it did not.

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### Forecaster Statistics

Forecaster Statistics For Unit 34933 / Job 01-02

Work Request No: 8067792	
Absolute / Relative: R	Last Fueling Date:
Acq / In Serv Date: 09/11/2000 03:00:00	Fuel when job was last done: 0
Avg Fuel: 0.000	Date job was last done:
Avg Meter1 (usage per day): 0.000	Usage1 when job was last done: 0
Avg Meter2 (usage per day): 0.000	Usage2 when job was last done: 0
Computed Fuel Interval in Days: 0.000	LTD Fuel at time of Forecast: 0
LTD Usage1 at time of Forecast: 3078	LTD Usage2 at time of Forecast: 407
Computed Usage1 Interval in Days: 0.000	
Computed Usage2 Interval in Days: 0.000	Last date meter1 was updated: 07/13/2004 03:00:00
Job Due Date: 07/21/2010 03:00:00	Last date meter2 was updated: 07/07/2004 11:13:04
Interval for Due Date (Basis): Time	Job Priority: 5
Job Due Date Based on Fuel:	Unit In-Service Date: 09/11/2000 03:00:00

- 6) **History tab** - Verify/modify the First Meter, Second Meter, Date Completed, LTD Fuel, LTD Usage (First Meter), and LTD Usage (Second Meter). This information is particularly important for recurring jobs as forecaster uses these values to determine when the job was last done and calculates to be due next.

- 7) **Sub jobs tab** - Same rules apply as being set at the MCC level.

## Setting Up a Job Schedule (Absolute vs. Relative)

The Standard Job MCC and Standard Job Unit frames enable the user to set up standard jobs at regular or absolute intervals. It's important to understand the difference between the two prior to creating these jobs.

### Absolute Jobs

Absolute jobs are those that must be done on a mandatory, non-varying, schedule, for example, state inspections which are performed once a year starting from a specific date or meter.

For purposes of time forecasting, if a job is done close to (but before) the job is due, the job's interval is considered satisfied and the next one will be due at the next interval. For example, if the absolute job is done annually and the due date is July 1, and the "earliest deviation" is 10%, if the job is done within 10% of 365 days before July 1 – that is, 36 days before July 1, or May 25 – the next occurrence will not be due until the following year's July 1.

For purposes of usage forecasting, there is no deviation – if the job is done just one kilometer/mile/hour early, it will still be due one kilometer/mile/hour from then.

There are important set-up requirements for absolute jobs including setting the First Time Criteria:

- 1) If the First Time Criteria in Standard Job MCC is populated, this will be the starting criteria for all units in this MCC, but still may be overridden at the unit level. The same rules would apply for the First Time Criteria in Standard Job Unit/Dept. More often than not, the time-based First Time Criteria at the unit level will be the best choice since the earliest date will be different for each unit for the standard job.
- 2) For example, an annual inspection that does not need to be performed in the first three years. If the First Time Criteria is not populated at either the Standard Job MCC or Standard Job Unit level, the in-service or acquisition date will be used for determining when the job should be considered done and due next (based on System Flags 1180 and 2001).
- 3) Absolute jobs do not care about when the job was last done, rather that when the job was last done it met the requirements of the calculated due date interval.
- 4) If a job is overdue and there are multiple occurrences of that job between the due date of the first occurrence and today, forecaster will ignore creating the occurrences between the first occurrence and today's date. This is because the occurrences between the overdue job and today will never get done. However, if there is another occurrence after today, that occurrence will be forecasted.

## Relative Jobs

A Relative job is forecast based upon adding the time and usage intervals to the last time the job was completed. For example, if an inspection is set to relative and has a time interval of 90 days and a usage interval of 3000 miles, M5 will predict the due date to whichever interval comes first based upon the last time the PM was performed. The last completion of the job information may be verified/updated on the Standard Job Unit, History tab.

If a job is on an open work order and it has not been completed, the forecaster assumes that the job is done at the moment that the forecaster is run. If the job is on an open work order and has completed date, the completed date will be used instead.

It is important that the values in the Last Completion of Job all accurately reflect when the job was last done. If the job is strictly based on a time interval, then the date completed would only be of importance for the forecaster.

The same rules would apply for the LTD Fuel for fuel-consumption based jobs, LTD Usage (First Meter) for primary usage based jobs, and LTD Usage (Second Meter) for secondary usage based jobs. The "Current Values on Unit" will always reflect now, and the date completed in this column will always show as today's date.

## Understanding Sub Jobs

A Sub Job is a job whose tasks are not only done as an independent job, but also during the performance of a less frequent job.

For example, if an oil change is done every 3000 miles and a more comprehensive tune-up done every 6000 miles, and changing the oil is included in the comprehensive tune-up, then to avoid having a unit come in for separate oil changes and tune-ups every 6000 miles, the tune-up job is defined as including the oil change job. We say that every second oil change is "absorbed" by the tune-up and is omitted as a separate job on the schedule.

Sometimes, though, the schedules fall out of sync. Say that the oil change was done early, at 2700 miles, making the next oil change due at 5700 miles. Should that oil change be done separately at 5700 miles, or can the unit wait until 6000? That is where the "elimination percentage" comes in.

A sub job will be done as part of another job if that other job is within a set percentage of the sub job's interval. In this case, an elimination percentage of 5% ( $300/6000$ ) will cause an extra oil change to be done at 5700, while a higher elimination percentage will cause the oil change to be done with the tune-up is due at 6000.

SAVE
UNDO
REFRESH
DELETE
FIND
RELATED ▾

## Standard Job MCC

**Job / MCC**

Job Code:

MCC:

+
Schedule
Forecaster
Loc Override
Subjobs

**Included Sub Jobs (Loaded 0 records)**

Sub Job	Description	Elimination	Reset Flag	
			<input type="checkbox"/>	

For **relative** jobs, if the sub job is done early or late, it will not affect the schedule of the parent job. That is, if the sub job is done every 90 days, and the parent job is done 180 days, if the sub job is done 10 days early, the parent job **will not be** due earlier nor will it be due later if the sub job would have been done 10 days late.

Conversely, if the parent job is done early or done late, the sub job due date **will be** affected since the last completed information comes from the parent job. (This paragraph applies only to relative jobs because by definition absolute jobs are not based on when the job was last done).

If a parent job goes overdue, and the sub job was already “absorbed” by the elimination percentage, the sub job will remain “absorbed” since the job is still due on the same date. However, this also assumes the calculations did not change.

For example, if the predicted daily usage has changed, it’s possible the due date was pushed earlier/later and moved my sub job outside of the elimination percentage.



**Note:** Forecaster must run to pick up the new calculations.

## 2. Submitting a Forecast

The Forecaster program creates work requests, based on available data and established criteria, for standard jobs. It is a batch process that runs on the batch server and is run from the Batch Process Manager frame.

The screenshot shows the 'Batch Process Manager' interface. At the top, there are buttons for 'SAVE', 'UNDO', 'REFRESH', 'DELETE', and 'FIND'. Below these is the title 'Batch Process Manager'. A dropdown menu labeled 'Batch Process:' is open, showing a list of options: 'ABC Class Assignments', 'Allocation', 'Archiver', 'Close Billing Period', 'End Of Day', 'End Of Period', 'Forecaster' (highlighted with a red box), 'Part History', 'Parts Requisitions', 'Planned Absence', 'Repeat Work', 'Run Billing period', 'Sold Units Archive', 'Unit/Component Record Purge', and 'Work Request Planner'. To the right of the dropdown is a checkbox labeled 'Exclude weekends and holidays:'. Below the dropdown is a table with columns: 'ID', 'Description', 'Status', 'Schedule Date', 'Last Run', 'Frequency', 'Holidays', 'Submitted By', and 'Run Desc'. The table currently shows '0 records'.

1) Select **Forecaster** from the dropdown menu.

This screenshot shows the 'Batch Process Manager' interface with 'Forecaster' selected in the 'Batch Process:' dropdown. Below the dropdown is a section titled 'Run Forecaster' which contains several input fields for configuration. The fields are arranged in a grid:

- Run Date: [text input]
- Email Notification: [text input]
- Forecast Date / From: [text input] To: [text input]
- Location / From: [text input] To: [text input]
- Unit/Dept/Comp No / From: [text input] To: [text input]
- Tech Spec / From: [text input] To: [text input]
- MCC / From: [text input] To: [text input]
- Activity Code / From: [text input] To: [text input]
- Owner Dept / From: [text input] To: [text input]
- Using Dept / From: [text input] To: [text input]
- Make / From: [text input] To: [text input]
- Model / From: [text input] To: [text input]

- 2) The earliest date that can be entered into the “Forecast From Date” field is the following day (for example, tomorrow).
- 3) The “Forecast To Date” should be a point in the future when jobs should be forecast through.
- 4) The “Email Notification” field should be populated with the email address of the user that should be notified that the forecaster batch process has completed. Multiple email addresses can be included by using a comma in between email addresses.
- 5) Users can narrow the units to be processed by using locations, units, MCCs, and such. These filters are optional.
- 6) Schedule Details - Users can schedule forecaster to run once, minutes, hours, days or months.
- 7) The Run Interval field will open if users select an interval other than “once”. Users can exclude weekends and holidays from the forecaster run.

When run, the forecaster does the following within the time interval specified:

- Deletes old work requests that are unlocked.
- Figures out the due dates for the first occurrence.
- Figures out the due dates for the remaining occurrences based on the intervals (if based on usage, the same average-use-per-day will be used).
- Eliminates sub-jobs.
- Eliminates occurrences that are forecasted outside of the time interval specified.
- Applies estimates setup at the Standard Job Tech Spec level.

## Forecaster Rules

There are some important rules to know prior to running forecaster:

- Locked work requests are not deleted by the forecaster process unless they are unlocked and are part of a standard job setup.
- If there’s a manual work request created for the standard job, the forecaster will skip trying to create one.
- If a relative job is overdue as of today, it’ll only create one occurrence.

## Reports

The following reports are available for Forecaster:

- Work Request Forecast Jobs by Department
- Work Request Forecast Jobs by Location
- Work Request Forecast Jobs by Operator
- Work Request PM Compliance
- Work Request Report
- Unit Work Requests

## Notifications

On the Interface Manager frame, there exists an Interface for delivering PM notifications. The interface is called PM Notification System by default.

SAVE
UNDO
REFRESH
DELETE
FIND

### Interface Manager

Interface: PM Notification System

**Interface Parameters (Loaded 21 records)**

Number	Description	Value
1	JOB REASON CODE	P
2	NOTIFY DAYS	30
3	MAINT LOC START	CNLOC1
4	MAINT LOC END	CNLOC3
5	USING DEPT START	CNDEPT001
6	USING DEPT END	CNDEPT002

Refresh

**Current Execution Schedule (Loaded 0 records)**

ID	Description	Status	Schedule Date	Last Run	Frequency	Exclude Holidays	Submitted By	Run Desc
----	-------------	--------	---------------	----------	-----------	------------------	--------------	----------



The interface will generate a list of work requests in an email based on the parameters provided. The purpose is to notify either the using department contact or the parking location contact of PM jobs due for units they are responsible for. This process can be scheduled to run on a regular basis. The following parameters are supported.

- **Reason Code:** Only select work requests that contain the value of this parameter. If left blank then all work requests are included.
- **Notify Days:** Only select work requests that are between tomorrow and the number of days provided in this parameter. This parameter cannot be left blank.
- **Maintenance Location Start & End:** Only select work requests where the unit maintenance location is between the start and end values of this parameter. If only the "start" value is provided then the process will only select work requests where the unit maintenance location is greater than or equal to the start parameter. If only the "end" value is provided then the process will only select work requests where the unit maintenance location is less than or equal to the end parameter.
- **Using Department Start & End:** Only select work requests where the unit using department is between the start and end values of this parameter. If only the "start" value is provided then the process will only select work requests where the unit using department is greater than or equal to the start parameter. If only the "end" value is provided then the process will only select work requests where the unit using department is less than or equal to the end parameter.
- **Parking Location Start & End:** Only select work requests where the unit parking location is between the start and end values of this parameter. If only the "start" value is provided then the process will only select work requests where the unit parking location is greater than or equal to the start parameter. If only the "end" value is provided then the process will only select work requests where the unit parking location is less than or equal to the end parameter.
- **Included Job:** Only select work requests where the work request job is equal to either the main job or sub job in the unit\_inc table.
- **Email Source:** The value must be either "D" for Using Department or "L" for Parking Location. If the value is "D" then the result will be grouped by using department and the using department email address is used as the "to" address of the email. If the value is "L" then the result will be grouped by parking location and the parking location email address is used as the "to" address of the email. The option of "O" (Operator) is a valid value for the email source parameter. Setting email source to "O" will select the operator of the unit's email address (if employee is valid and an email exists on Employee Main). If the unit does not have an operator or an email address associated, the default logic for "D" (Department) will notify the department email address.

- **Include Overdue:** If this parameter value is "Y," then process results will include not only the work requests that were selected based on the Notify Days parameter but also all overdue work requests. If you have work requests with many occurrences that were not added to a work order then you may see the same job listed more than once on the email.
- **HTML:** Possible values are "Y" or "N". If the value is "Y" then email is sent as an HTML document. If the value is "N" then email is sent as plain text.
- **From Address:** This value represents what the user will see in the "From" address of the email. You do not need to include the domain (for example, assetworks.com) as that will be selected from the M5\_PARAMS table.
- **Subject:** This value represents what the user will see in the subject line of the email.
- **Header:** This value represents what the user will see at the beginning of the email message.
- **Body:** This value represents what the user will see directly after the Header value but before the list of work requests.
- **Footer:** This value represents what the user will see after the list of work requests.
- **Send Status To:** This is the email address where the process status should be sent. You must include the entire email address including the domain.

## Forecaster History

There is a table which stores the history of the last 25 forecaster runs. It can only be seen by querying against the database:

```
select * from work_forecast_param order by run_no desc;
```

One of the columns is the run\_no. The forecaster uses that number as the part of the "reported by" on each work request it creates. For example, if the run number is 234, "reported by" on Work Request Main will say "fcst #234".

## Verifying Meters

SAVE
UNDO
REFRESH
DELETE
FIND
ATTACH
RELATED ▾

### Unit/Component Use/Cost History

Unit Information

Unit:  2002 ECH3-70 CR ELLIOT BKT Status: Active Unit

Primary Meter

Meter Date:

Meter Reading/Type:  / MILE

Meter LTD Usage:

ECU LTD Usage Offset:

Meter Avg Use Day/Period:  /

MCC Min Usage Day/Period:  /

MCC Max Usage Day/Period:  /

Unit Exp Usage Day/Period:  /

Secondary Meter

Meter Date:

Meter Reading/Type:  / MILE

Meter LTD Usage:

ECU LTD Usage Offset:

Meter Avg Use Day/Period:  /

MCC Min Usage Day/Period:  /

MCC Max Usage Day/Period:  /

Meter Information (Loaded 104 records)

Period	Work Orders	Meter 1 Usage	Meter 2 Usage	Labor Time(Hrs)	Labor Cost	Part Cost	Comm Cost	Fuel Cost	Fuel Qty	Alternate Fuel Cost	Alternate Fuel Qty	Electric Fuel Cost	Electric Fuel Qty
202001	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	0	\$0.00	0
201909	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	0	\$0.00	0
201807	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	0	\$0.00	0
201806	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	0	\$0.00	0
201805	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	0	\$0.00	0
201804	0	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	0	\$0.00	0	\$0.00	0

When forecasting on usage, monthly meter readings at the very least should be entered. The Unit Use/Cost History (Unit Usage History) frame in M5 displays the calculated average usage per day and is very similar to forecaster. The only difference is that while forecaster uses the current date of the run, unit use/cost history uses the last meter date. This is very helpful for troubleshooting forecaster issues.

The LTD readings are maintained at the top of the frame, not within the Meter Information Period Table. The word 'usage' means the number of miles, kilometers, or hours driven during that period. A unit may have an LTD reading of 124,000 miles, but the usage for one period may only be 125 miles.

Bad meter readings can trickle down and impact forecasting, replacement modeling, and warranty functionality, so catching and fixing bad readings should be of primary importance to any fleet.

Since there is no surefire way to prevent the data entry of a bad meter reading, as many users simply ignore warning pop-ups, the best solution is for a person or a group of people to take ownership of all incoming readings. To accomplish this, a methodology of checking and double-checking all meter readings should be established.

### 3. Glossary of Terms

**Meter Reading vs. Usage:** A meter reading is the number actually displayed on the odometer while the usage is the difference between the current reading and previous readings. For example, unit #567 has a current odometer reading of 58,000 miles. Last week, the odometer read was 57,500 miles. This would mean unit #567 has a usage of 500 miles in the past week. Further, this would mean the unit, based on these two readings, has an average use per day of 71 miles per day (500 miles / 7 days). Also, a unit's life-to-date usage may become out-of-synch with the odometer in case of meter replacement or rollover. The life-to-date usage always increases.

**Primary Meter:** The meter type, (for example, hour, mile, or kilometer), which has been designated as the 'primary' meter on the MCC for that unit.

**Primary Meter Reading:** This term refers to the actual meter reading displayed on the primary meter of that unit; in other words, what the user literally sees displayed on the odometer.

**Secondary Meter:** The meter type (for example, hour, mile, or kilometer) that has been designated as the 'secondary' meter on the MCC for that unit.

**Secondary Meter Reading:** This term refers to the actual meter reading displayed on the secondary meter of that unit.

**Primary LTD Usage:** This term refers to the total life-to-date usage the unit has accumulated over the life of the unit for the primary meter. This figure may often be greater than the Primary Meter Reading as the unit could have encountered a roll-over. The Primary LTD Usage should always be greater than or equal to your Primary Meter Reading, never less than. If the unit has an in-service primary meter reading, the LTD Usage will consider this the starting primary meter reading.

**Secondary LTD Usage:** This term refers to the total life-to-date usage the unit has accumulated over the life of the unit for the secondary meter. This figure may often be greater than the Secondary Meter Reading as the unit could have encountered a roll-over. The Secondary LTD Usage should always be greater than or equal to your Secondary Meter Reading, never less than. If the unit has an in-service secondary meter reading, the LTD Usage will consider this the starting secondary meter reading.

## 4. Troubleshooting

Issue	Potential Resolution
<b>Due date forecasted is in the past</b>	Go to Standard Job Unit/Dept and be sure the last completion date is inserted for a relative job or beginning date for an absolute job. If these are left blank, M5 will forecast by the acquisition/in-service date on the unit, which may be causing the forecasted date to be past due. If those fields are complete, and the job also has an interval for usage, select Unit Use Cost History or Meter Journal Display. A negative usage or lower usage may cause the due date to be in the past.
<b>The job was performed, but M5 is forecasting the job as still due</b>	Select Standard Job Unit/Dept frame to see the last completion or beginning dates to be sure they are set. Is the job absolute? Select to see if the job met the requirements of the absolute job due date.
<b>A job is not forecasted when it should be</b>	Is the job a sub-job of another higher-level job? If yes, select Standard Job Unit/Dept for the higher-level job to be sure the elimination percent is not set too high. A 100% elimination (or possibly lower) would never forecast that PM. If an interval is set for usage, check Unit Use Cost History or Meter Journal Display to be sure the usage is correct. If the usage is too low or negative a job may not forecasted.
<b>A job is forecasted too many times</b>	The meter usage must be too large. Was there too much usage entered in one period? Look at the average use per day.

## 5. Updates

Release	Section	Description
23.2	All sections	Applied miscellaneous writing style updates throughout the document.
24.0	<a href="#">System Flags</a>	Updated reference to the System Flags Table guide. Removed the System Flags table.