TMASYSTEMS

UC25 | April 8th - 10th 2025

Preventive Maintenance Concepts – Basic / Advanced

UC 25 YEARS

OF COMMUNITY, PARTNERSHIP, AND GROWTH

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Invested 10 years as Preventative Maintenance Coordinator at a state university developing a robust PM program. Reduced HVAC corrective work orders 84% over a 4-year period. Reduced operational costs and service interruptions across the board while improving equipment and asset care.

Brady Wetzel

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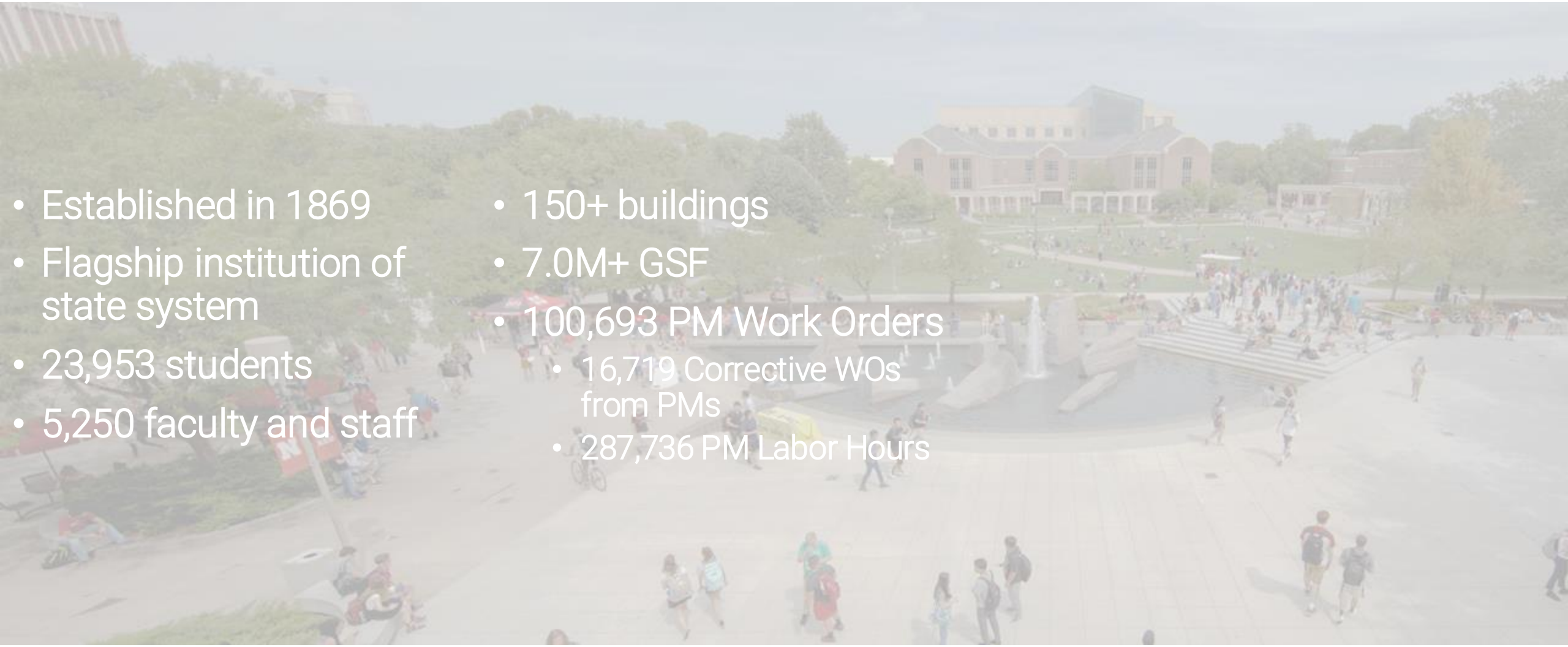
Supervise and helped implement the Preventive Maintenance Zone at University of Nebraska. Was on the team that implemented TMA in 2013 at the University of Nebraska. Maintain a robust TMA database with over 22,000 pieces of equipment and over 300 PM tasks.

University of Nebraska-Lincoln



- Established in 1869
- Flagship institution of state system
- 23,953 students
- 5,250 faculty and staff

- 150+ buildings
- 7.0M+ GSF
- 100,693 PM Work Orders
  - 16,719 Corrective WOs from PMs
  - 287,736 PM Labor Hours

Preventative Maintenance Concepts

Basic

Topics

1. Purpose of PMs
2. Identifying PM items
3. PM Prerequisites
4. Task Functions (Task Sheets, Master Checks, General Inspection)
5. PM Schedules
6. Load Balancing
7. PM Compliance and Reporting

PURPOSE OF PMS

- Maintain the life expectancy of key equipment
- Ensure mission-critical equipment or areas are operational
- Reduce corrective/ reactive maintenance
- Reduce repair/ replacement cost
- Manage routine/ renewal tasks

IDENTIFYING PM ITEMS

01 Life Safety

02 Mission-Critical Items

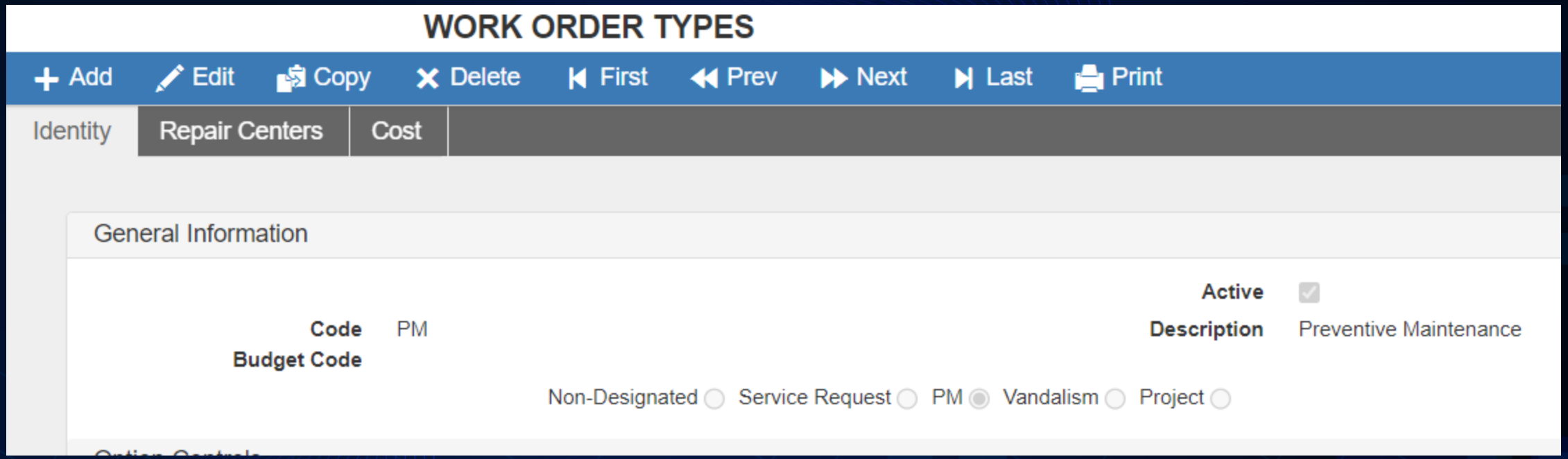
03 Expense Items

04 Anything that will reduce operational costs

PM Prerequisites

1. Work Order Type
2. Priority
3. Trade
4. Maintenance-Worthy Items (MWI)
5. Meter (if meter based)
6. Load Balancing
7. Task Codes

Work Order Types



Priorities for PMs

Code	Description
1	Emergency
2	Urgent
3	Routine
4	Scheduled
5	Deferred

PM Schedule Entry

Task Code	AHU-Q
Task Description	Air Handling Unit - Quarterly
Repair Center	Physical Plant
Work Order Type	Preventative Maintenance
Work Order Subtype	
Priority Code	3
Trade	
Department	
Account #	

Task Sheet vs Master Checks

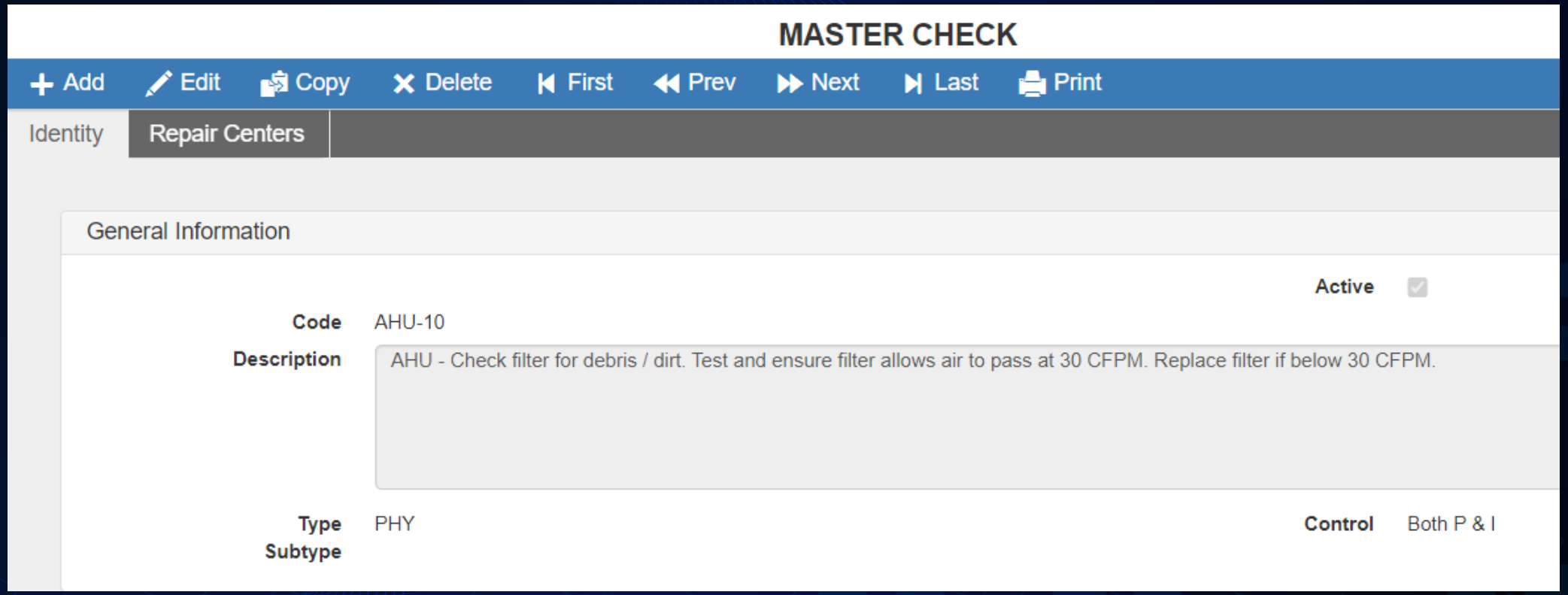
Task Sheet

- Convenient for copying OEM specifications
- Simple to create
- Easily editable
- Basic
- Designed to tell the tech what to look for and do, no feedback needed
- Un-trackable trends in data

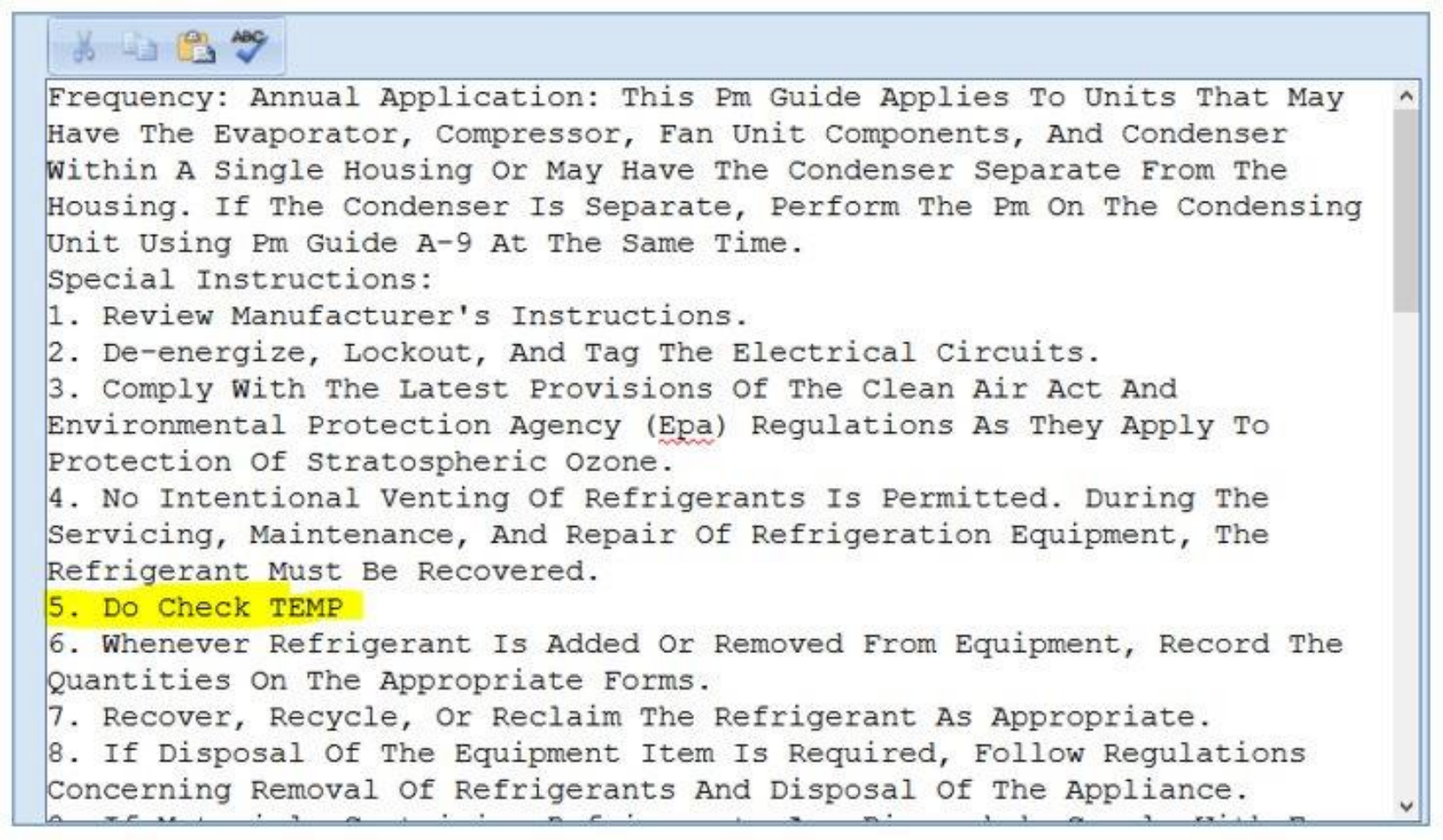
Master Checks

- Trackable trends
- Track reading
- Track Pass/Fails
- Track the tech that recorded the values
- Can generate corrective WO upon failing check

Master Check



Task Sheet with Master Check



Frequency: Annual Application: This Pm Guide Applies To Units That May Have The Evaporator, Compressor, Fan Unit Components, And Condenser Within A Single Housing Or May Have The Condenser Separate From The Housing. If The Condenser Is Separate, Perform The Pm On The Condensing Unit Using Pm Guide A-9 At The Same Time.
Special Instructions:
1. Review Manufacturer's Instructions.
2. De-energize, Lockout, And Tag The Electrical Circuits.
3. Comply With The Latest Provisions Of The Clean Air Act And Environmental Protection Agency (Epa) Regulations As They Apply To Protection Of Stratospheric Ozone.
4. No Intentional Venting Of Refrigerants Is Permitted. During The Servicing, Maintenance, And Repair Of Refrigeration Equipment, The Refrigerant Must Be Recovered.
5. Do Check TEMP
6. Whenever Refrigerant Is Added Or Removed From Equipment, Record The Quantities On The Appropriate Forms.
7. Recover, Recycle, Or Reclaim The Refrigerant As Appropriate.
8. If Disposal Of The Equipment Item Is Required, Follow Regulations Concerning Removal Of Refrigerants And Disposal Of The Appliance.

PM Item vs PM Task

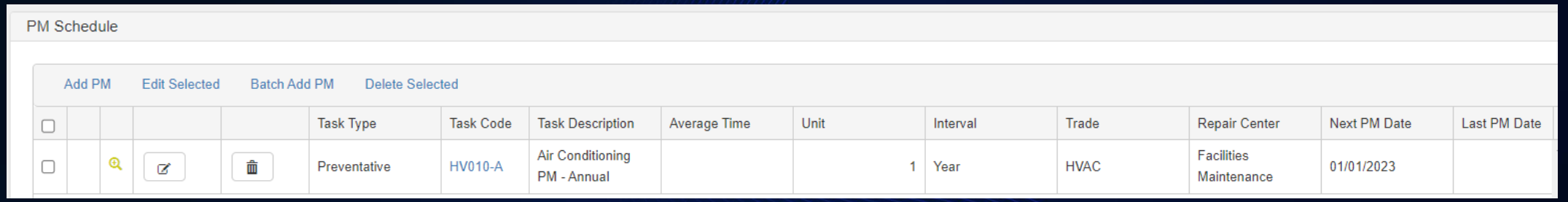
Assign PM Task to Item

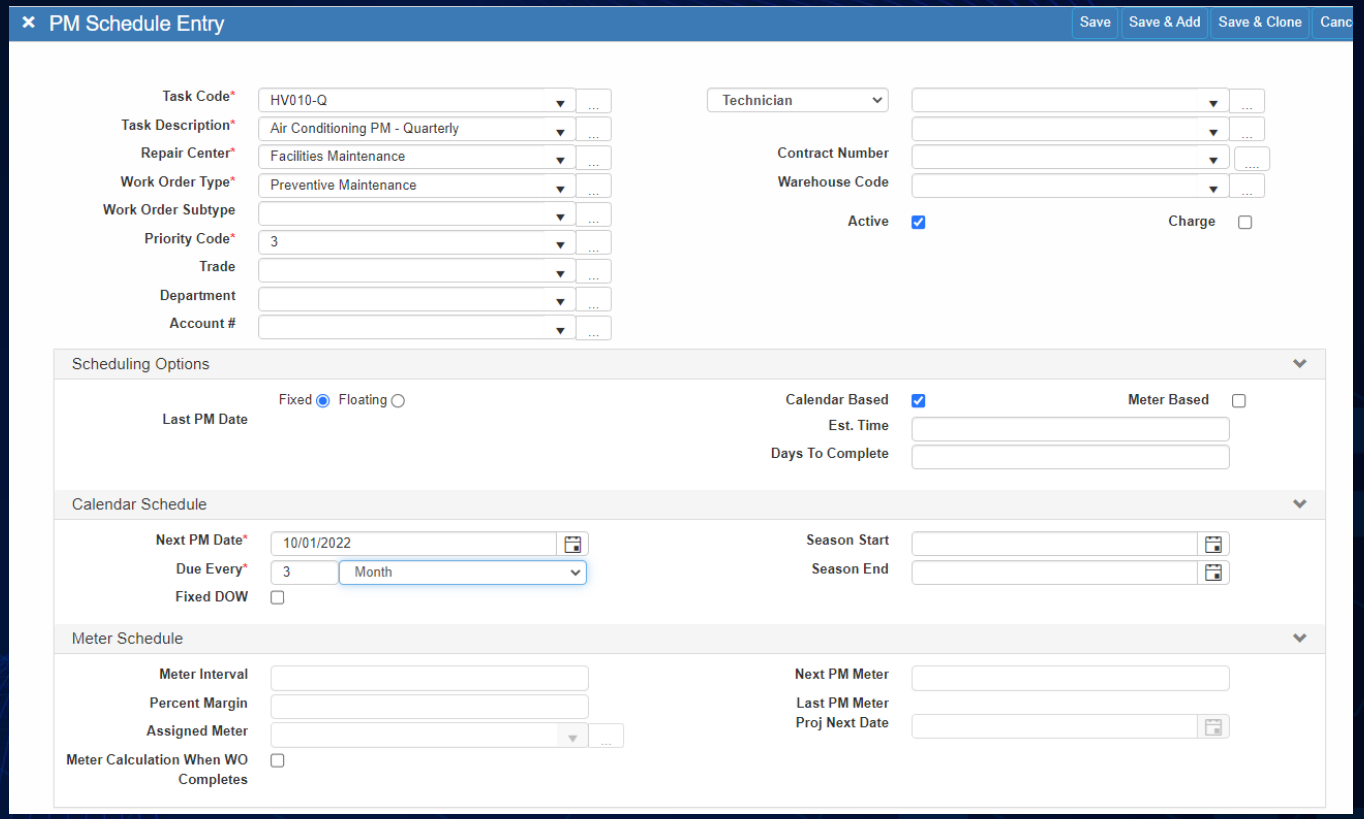
- Simple
- Functional
- Limited

Assign Item to PM Task

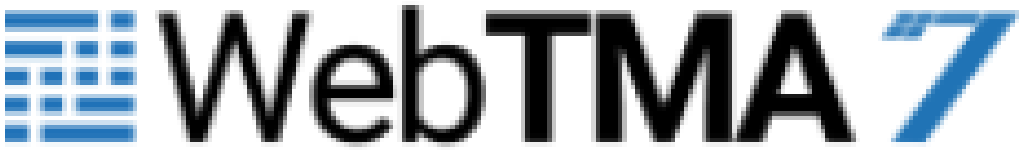
- Simple
- Functional
- Efficient
- Informative
- Load Balanced

PM Schedule





Let’s look at scheduling a PM in



Fixed vs Floating

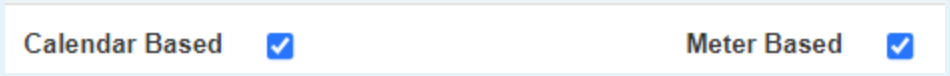
Floating PMs

- Meters
- Mowing

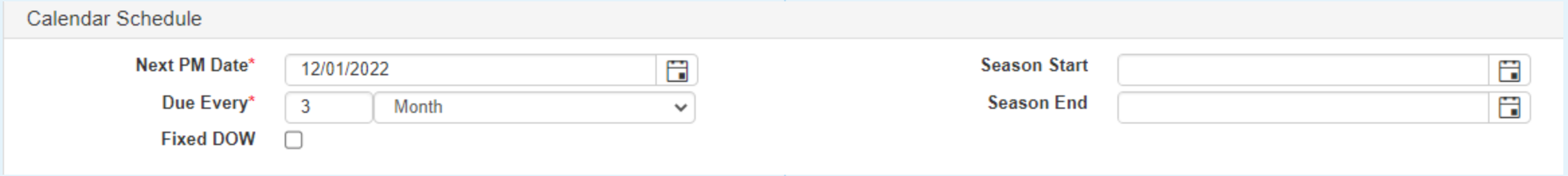
Fixed PMs

- Everything else

Calendar vs Metered



Calendar based PM



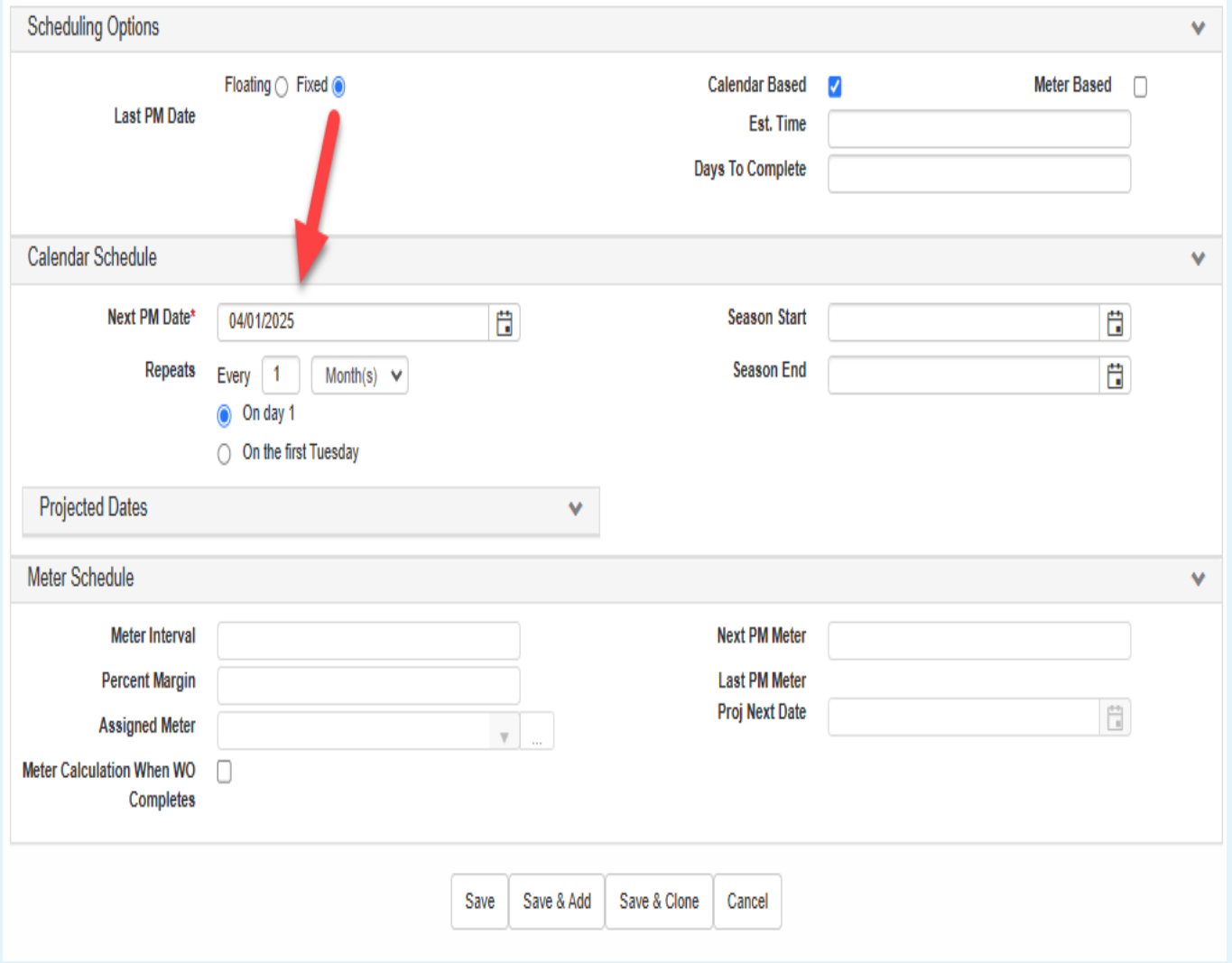
Metered based PM

The “R” rule – new feature incorporated into PM scheduling

Current Improvements to PM scheduling being offered

- For Fixed PM schedules
- Allows you to set the schedule for the beginning of the month or the first weekday of the month depending on the day you choose
- Eliminates the *Fixed DOW* checkbox while still integrating the functionality and simultaneously allowing you to schedule more than one fixed day of week per schedule to reduce the number of PM schedules per Task or Item
- Interval display example: *Every 4 weeks on a Tuesday*
- Displays forecasting for user confirmation while using

Fixed PM scheduling looks and works a bit differently now

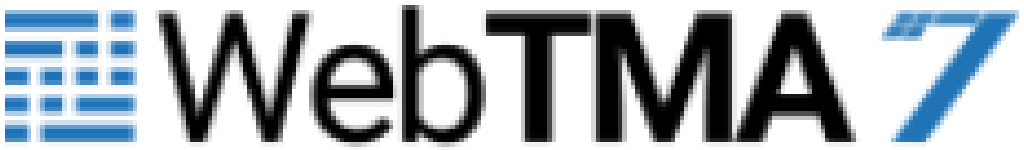


The “R” rule – only to improve

Additional enhancements coming throughout the year

- Cannot edit an existing schedule and convert to an R rule, must delete existing schedule and re-enter as an R rule
- Will not currently show up on existing canned PM Schedule reports in Report Manager – a better solution for PM forecasting coming

Let’s look at R rule PM scheduling in



Load Balancing – University Example

PM Seasonal Items

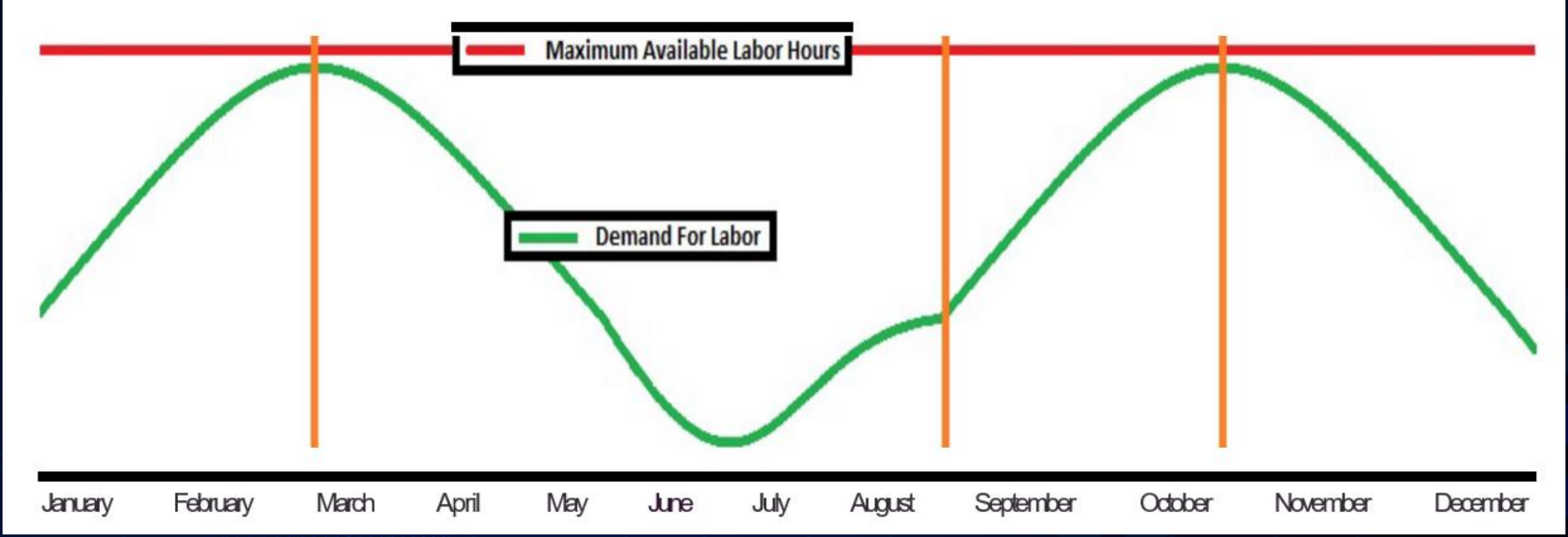
- **Spring PMs for Cooling Systems**
  - Cooling Systems
- **Fall PMs for Heating Systems**
  - Heating Systems
- **Pre-Fall PMs**
  - Residential / Housing Buildings and Areas
- **Non-Seasonal Items**

Load Balancing on an Annual Scale

Peak Cooling Prep

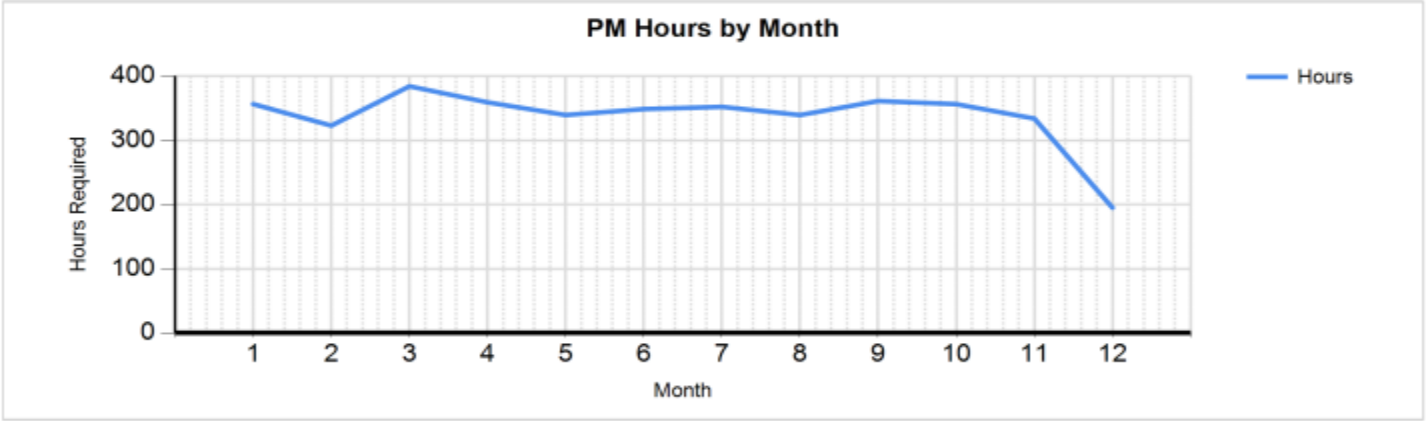
Fall Semester Start

Peak Heating Prep



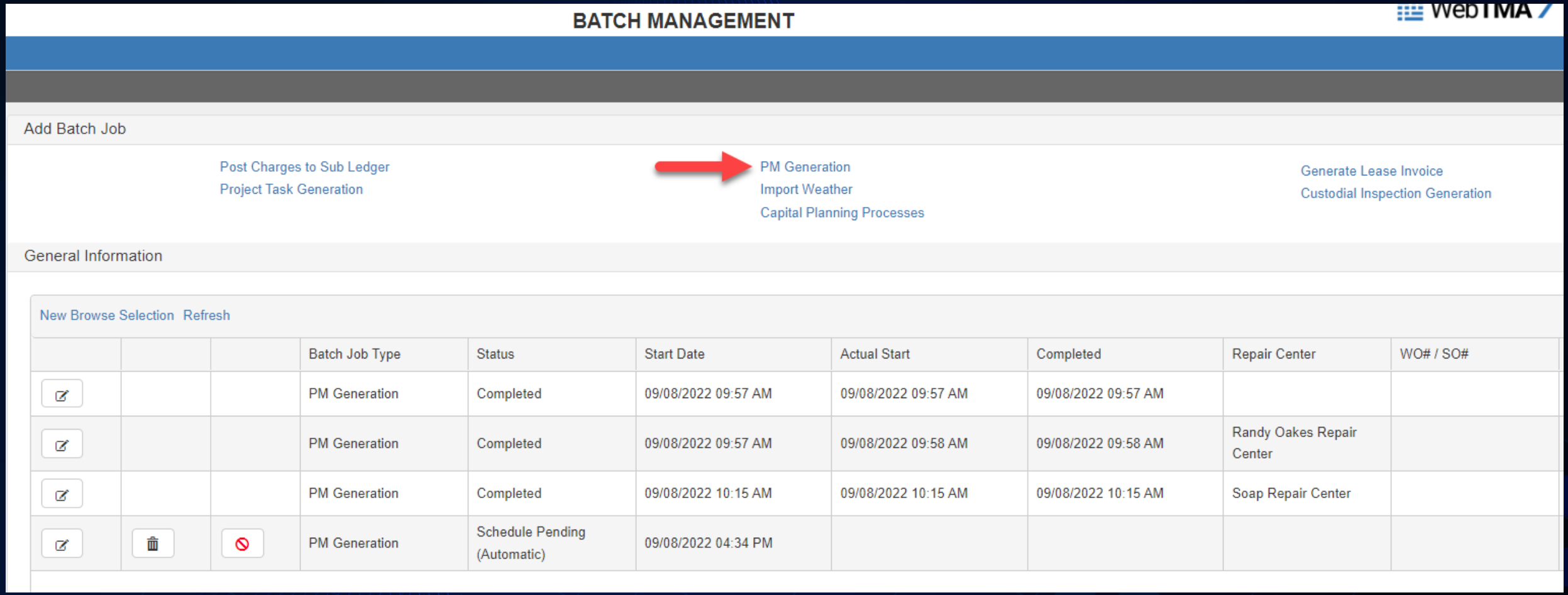
Load Balancing

PM Load Balance Summary by Trade



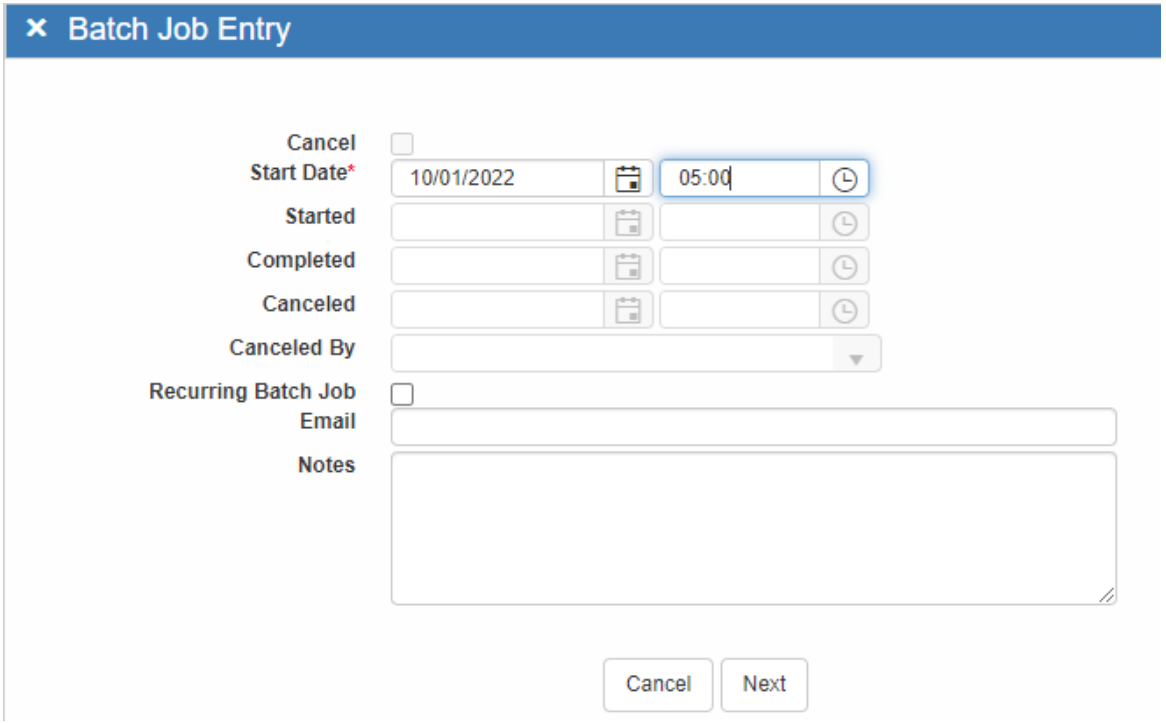
HVAC	Month	Hours
	1	356.50
	2	323.00
	3	384.25
	4	359.25
	5	339.50
	6	348.75
	7	352.25
	8	339.50
	9	361.25
	10	356.50
	11	334.00
	12	195.25

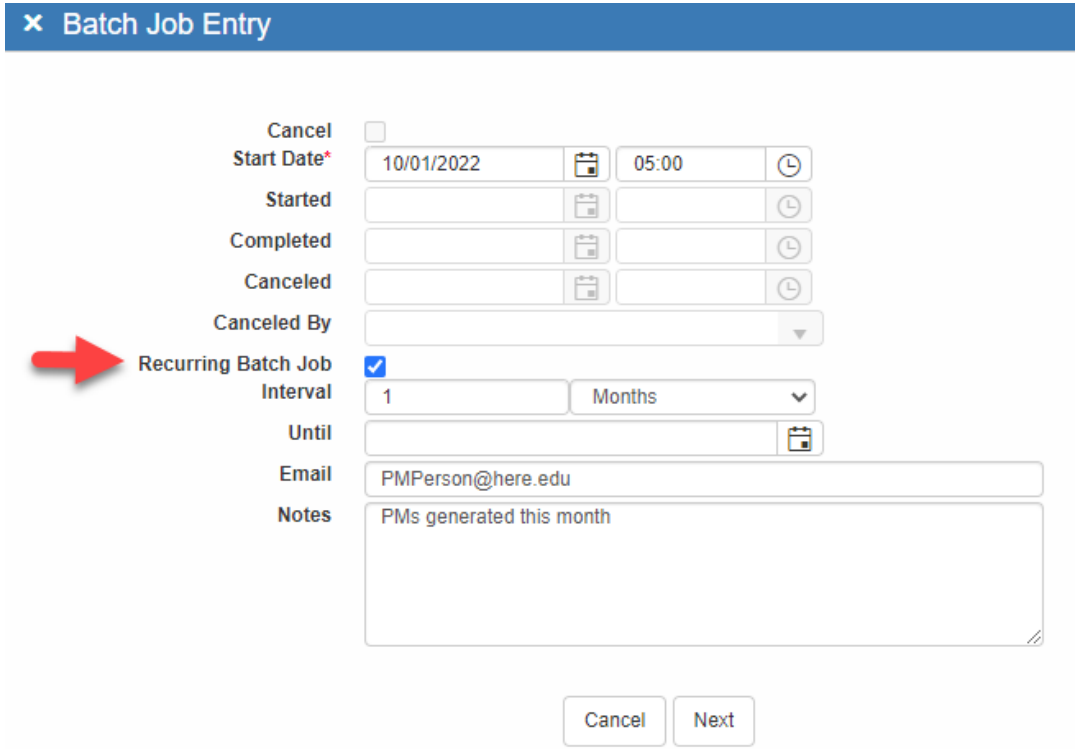
Adding PM Batch Jobs



			Batch Job Type	Status	Start Date	Actual Start	Completed	Repair Center	WO# / SO#
			PM Generation	Completed	09/08/2022 09:57 AM	09/08/2022 09:57 AM	09/08/2022 09:57 AM		
			PM Generation	Completed	09/08/2022 09:57 AM	09/08/2022 09:58 AM	09/08/2022 09:58 AM	Randy Oakes Repair Center	
			PM Generation	Completed	09/08/2022 10:15 AM	09/08/2022 10:15 AM	09/08/2022 10:15 AM	Soap Repair Center	
			PM Generation	Schedule Pending (Automatic)	09/08/2022 04:34 PM				

Single vs Recurring

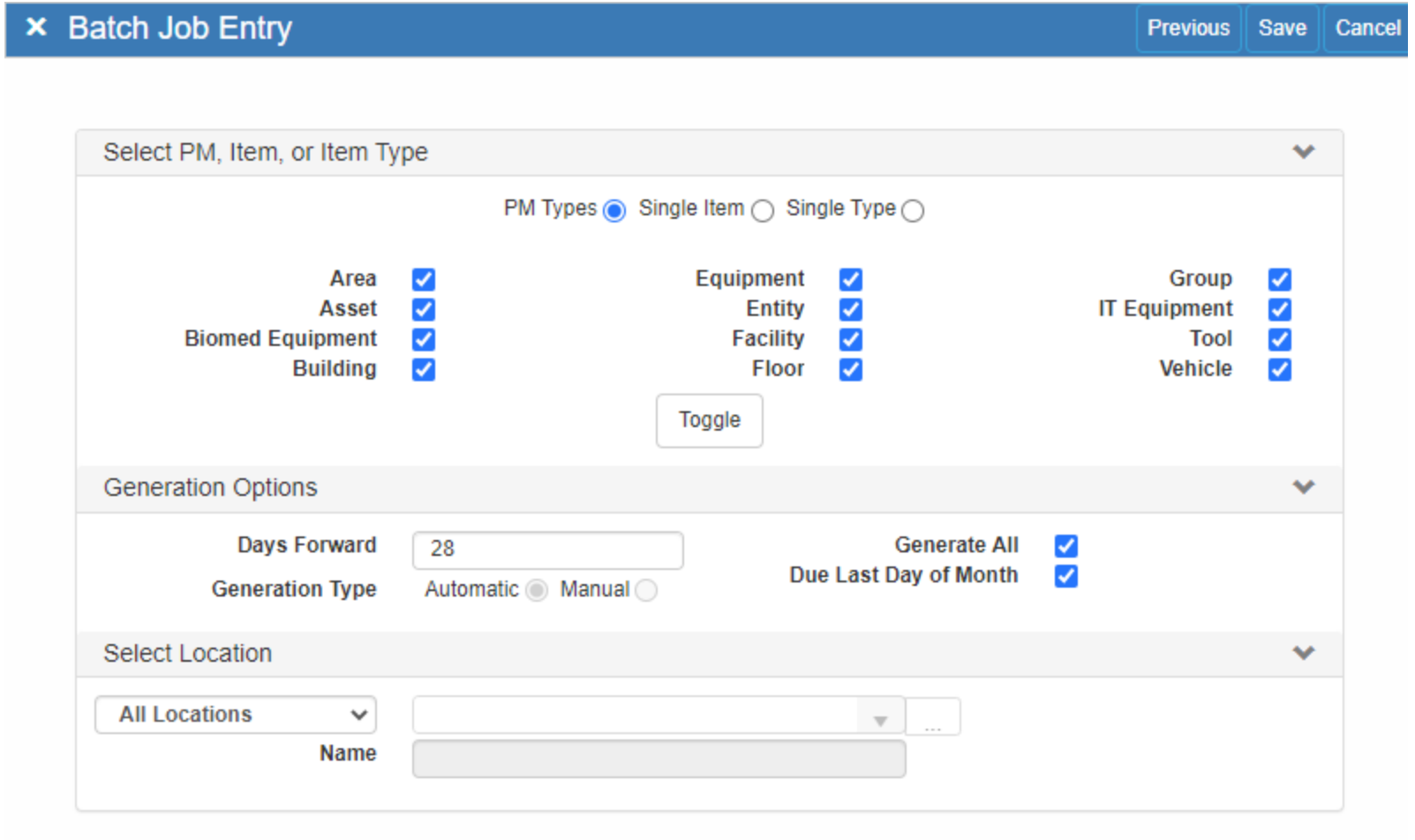




PM Generation

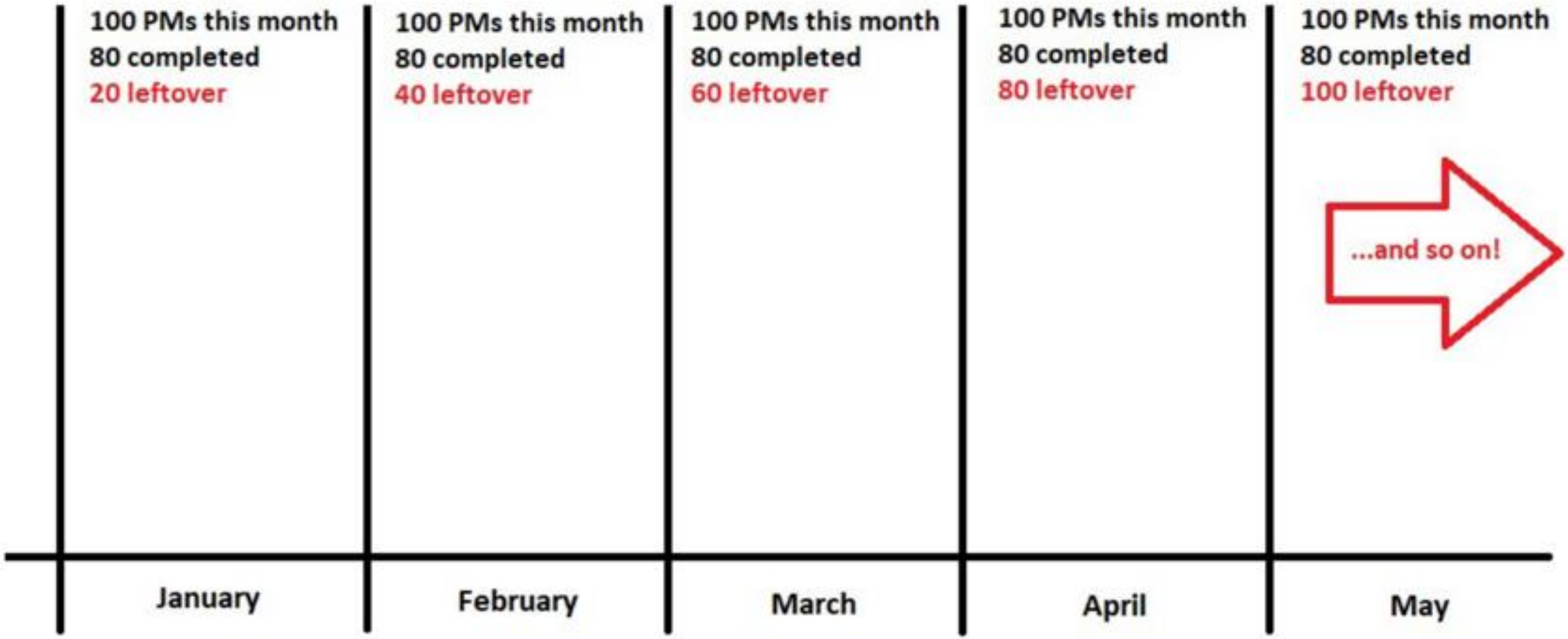
Options

- Generate All
- Due Last Day of Month
- Days Forward
- Manual vs Automatic

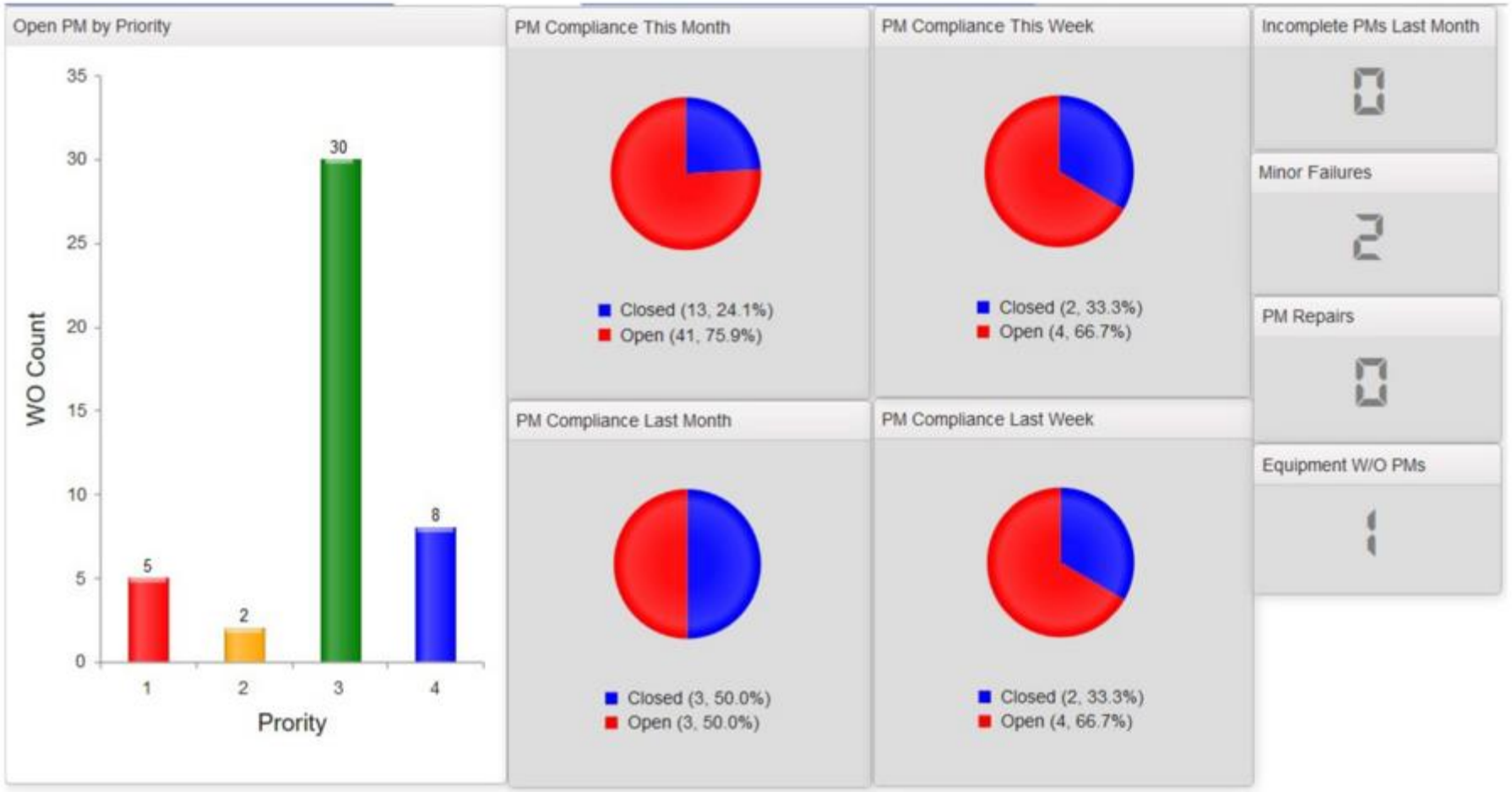


Let’s look at Batch Management in

PM Compliance Concept



PM Compliance and Reporting



PM Compliance and Reporting

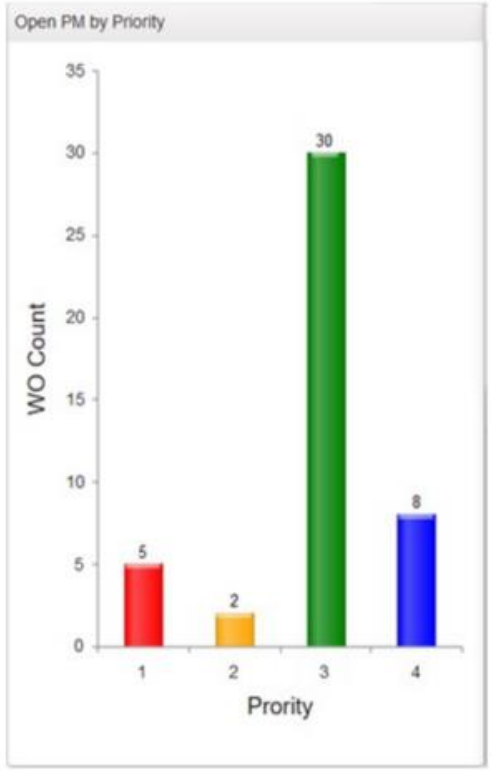
PM KPIs

PM Compliance

PMs by Priority

Major Failures

Minor Failures



Let’s look at a PM Dashboard Tab in

Preventative Maintenance Concepts

Advanced

Topics

1. Groups vs Individually Tagged PMs
2. Stabilizing PM Tasks
3. Advanced Load Leveling Techniques
4. PM Rollover
5. PM KPIs
6. Maintaining Compliance

Group vs Individually Tagged PMs

PROS

- Reduce paper by reducing the number of work orders
- Time saving by reducing the number of transactions

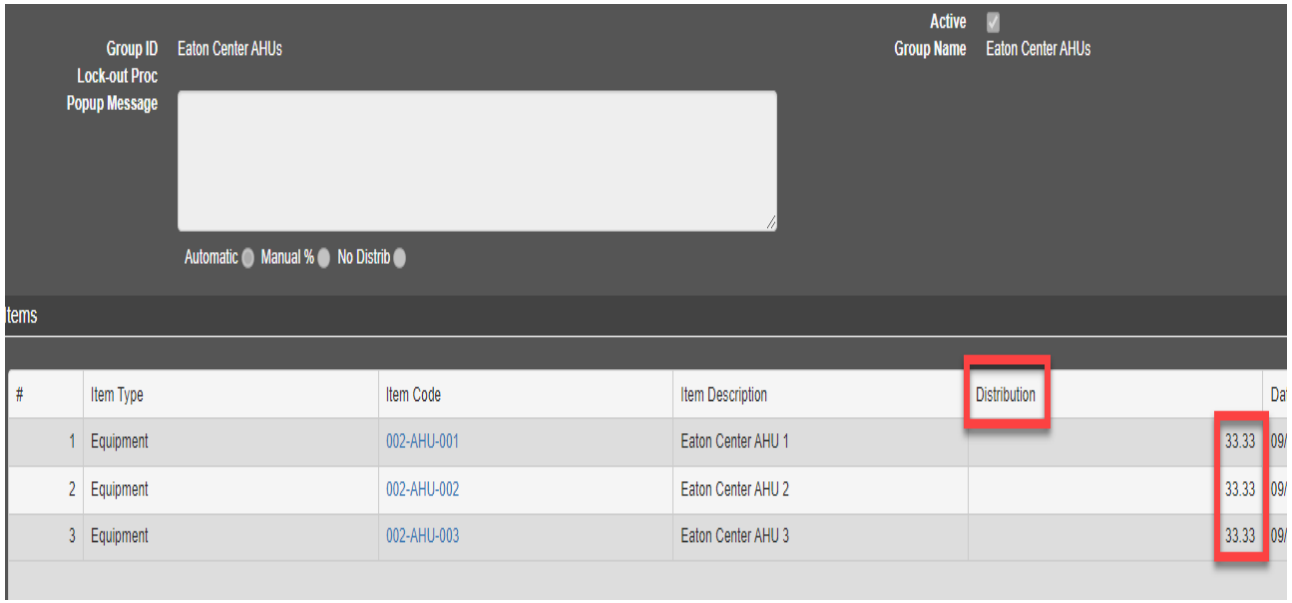
CONS

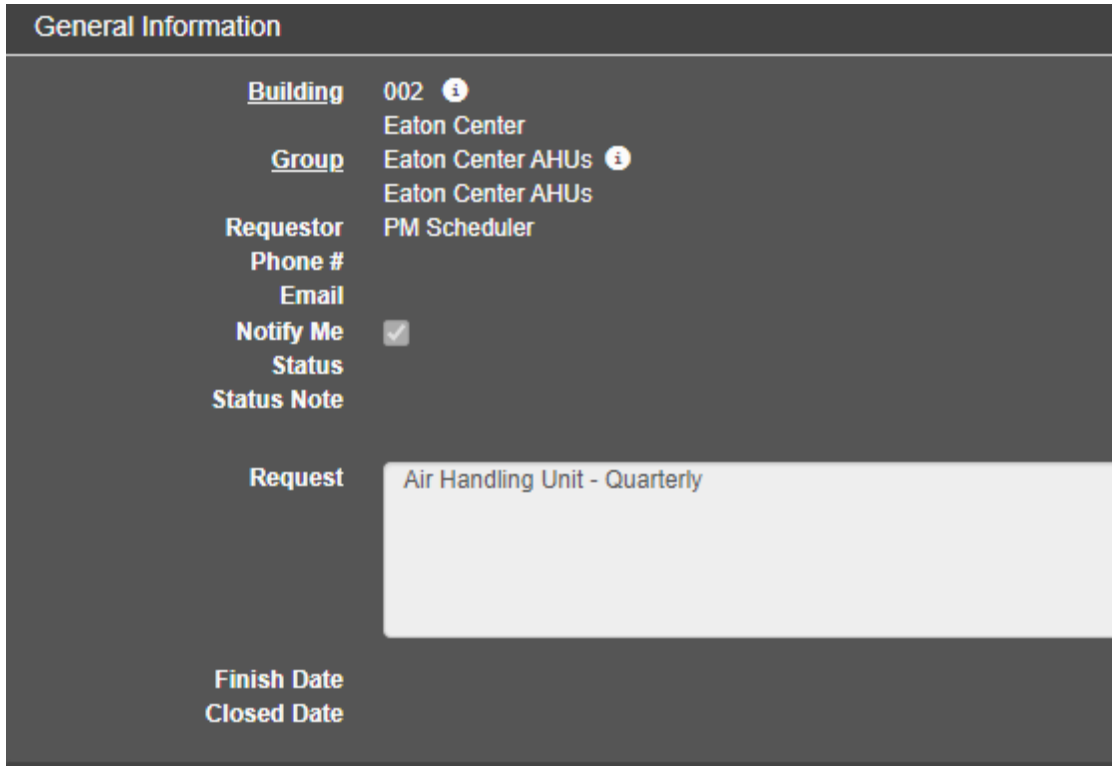
- MWIs may not always be consistent
- Masks cost rollup
- Masks PM compliance / progression
- Impossible to track the true completion

Consider the benefits compared to the tracking and accountability

Groups vs Individually Tagged PMs

- Building
- Cost separation





Stabilizing PM Task

Start with OEM specs

Evaluate performance

Adjust Schedules based on use and environment

- Interior vs Exterior
- Office vs Lab or Server Room
- OEM vs Your Organization

Advanced Load Leveling Techniques

Reports

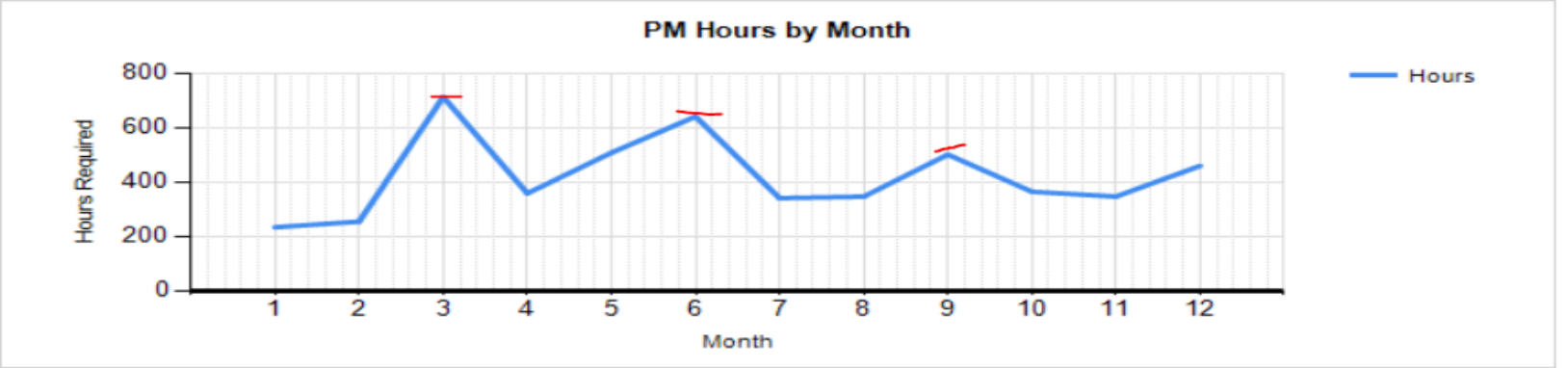
- PM Load Balance Summary
- PM Load Balance Detail

Techniques

- Add seasonal items then fill in the valleys
- Group by location (some months may have more time)
- Plan for time off and holidays

Advanced Load Balancing Techniques

PM Load Balance Summary by Trade



MEP/HVAC	Month	Hours
	1	232.85
	2	253.35
	3	712.35
	4	357.45
	5	507.34
	6	640.60
	7	339.72
	8	345.62
	9	500.47
	10	363.62
	11	345.83
	12	459.10

PM Rollover

1. Do NOT allow PMs to cross Compliance period
2. Batch Close Last Periods PM Work Orders
3. Auto Batch Close Option

Grading your PM Program

Evaluation Period (Analytics)

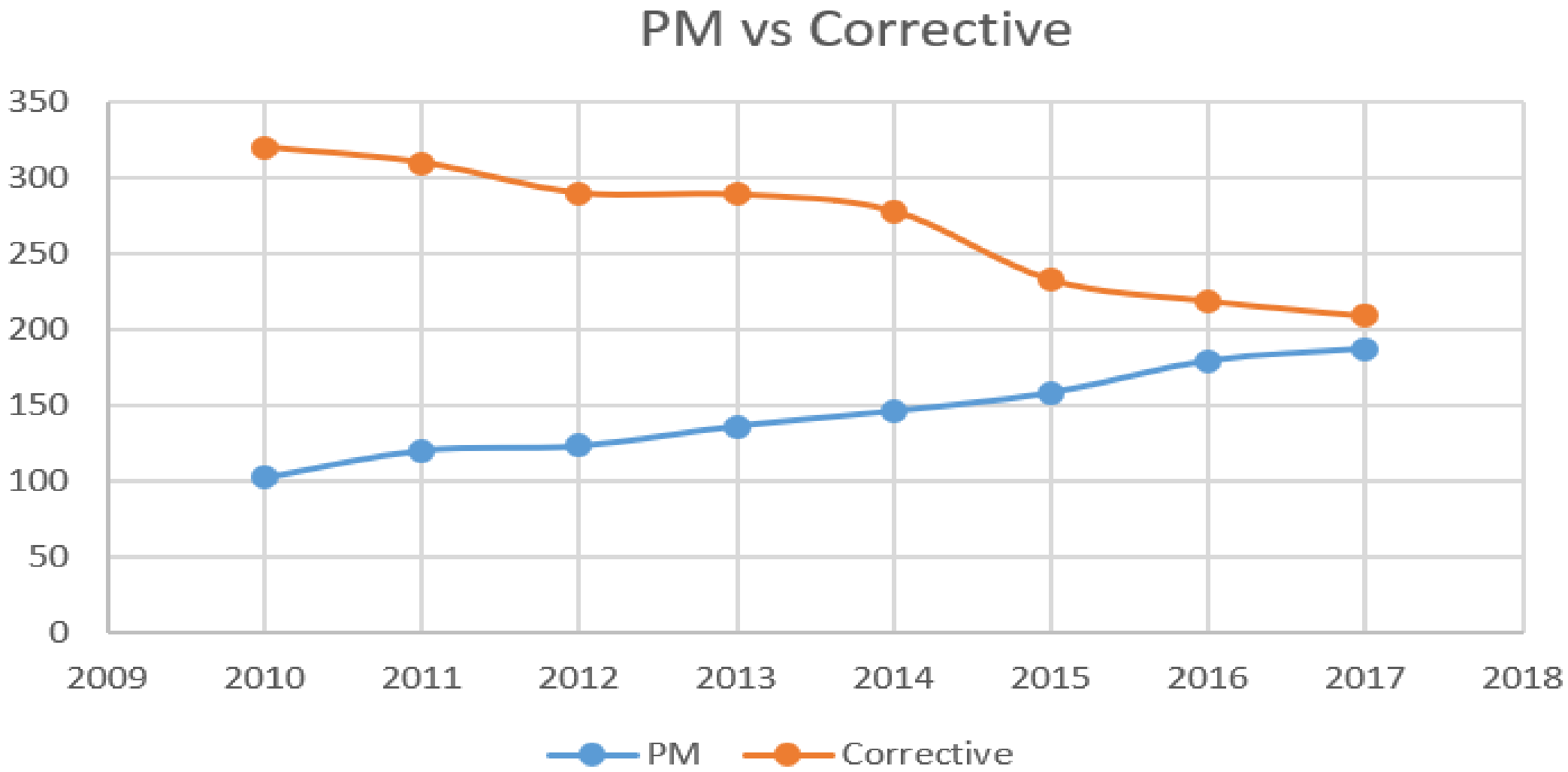
Major and Minor Failures

Correctives vs PMs

Compliance on Life Safety and Critical Assets

Overall Compliance Score

Efficient Time Management



Maintaining Compliance

1. Dedicated Techs or PM Crews
2. Do not repair as you go
3. Rotate Employees

TMASYSTEMS

Thank You!

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