Presenters

Paul Burris

- Utility Operations Manager for the City of Elmhurst
- Class 1 WW and Class “A” Potable Water Certifications
- Master Public Administration – Governors State University
- Licensed in 5 other states at highest levels (AZ, IN, MI, NJ, NV)
- Adjunct Teacher for SIUE/ERTC
- 2018 – National APWA Water Resource Manager of Year

Eider Alvarez-Puras

- Project engineer in Baxter & Woodman's wastewater department
- Primary area of expertise is the design of energy recovery and nutrient removal solutions for municipal water resources recovery facilities
- Master's degree in Environmental Engineering from the Illinois Institute of Technology and a Bachelor's Degree in Chemical Engineering from the University of the Basque Country in Spain
- Volunteer with the non-profit organization Global Water Stewardship and a member of IWEA's LIFT committee

Asset Management through CMMS

City of Elmhurst Case Study

Paul Burris and Eider Alvarez-Puras

May 10, 2019

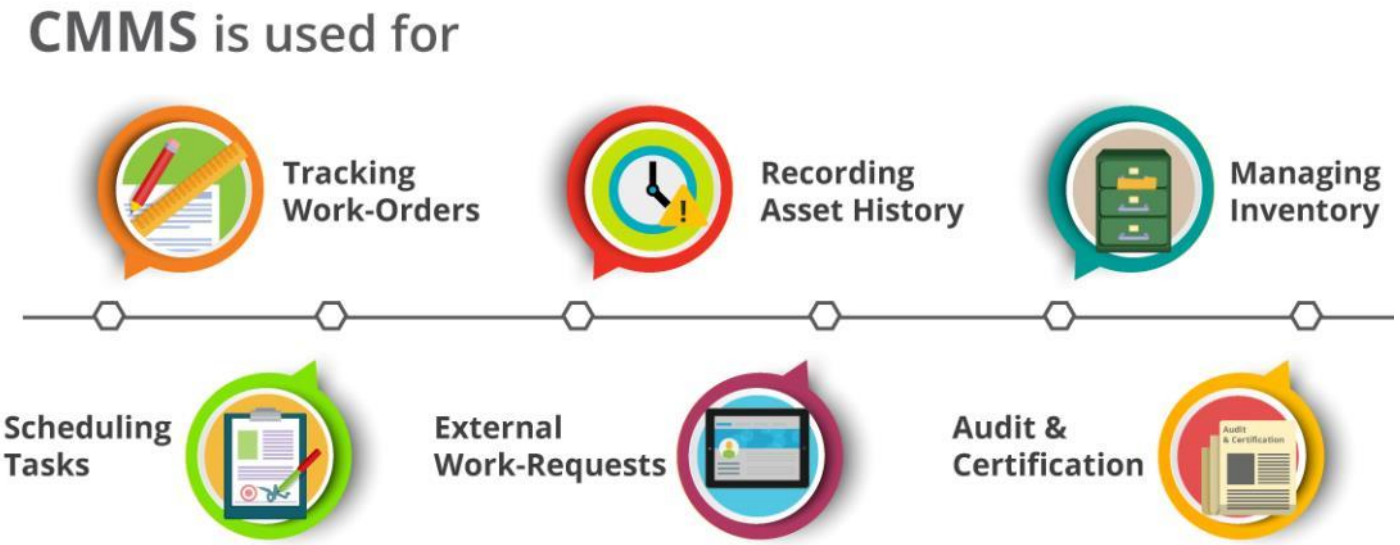
CMMS

Computerized Maintenance Management System

CMMS

What is a CMMS Program?

Not only a database, it provides Management Tools:



Picture courtesy of MyTechLogy

CMMS

A CMMS program requires a significant investment of time and care to start and maintain, but provides invaluable insight into the finances of operating a Public Works.

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Agenda

- City's CMMS Goals
- City's Public Works Department
- City's CMMS software
- Original CMMS Implementation
- Additional CMMS Implementation – Water Production & Wastewater Treatment Division
  - Step 1: Asset Inventory
  - Step 2: Preventive Maintenance Setup
  - Step 3: Workflow, Tablets, and Training
- Conclusions
- Future Steps

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City’s CMMS Goals

City´s Public Works Goals

- Update asset attributes and O&Ms
- Paperless Work Requests and Work Orders
- Utilize mobile tablets to enhance productivity
- Consolidated Preventative Maintenance Tasks
- Data driven reports

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Background

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City of Elmhurst

City of Elmhurst

City of Elmhurst PW Operations – 2 Divisions

Water Production & Wastewater Treatment

- 20 MGD MDF Water Reclamation Facility
- 10 Sanitary Pumping Stations
- 12 Storm Pumping Stations
- 3 Reservoirs
- 3 Elevated Water Storage Tanks
- 3 Water Pumping Stations

Water Distribution & Sanitary Collection

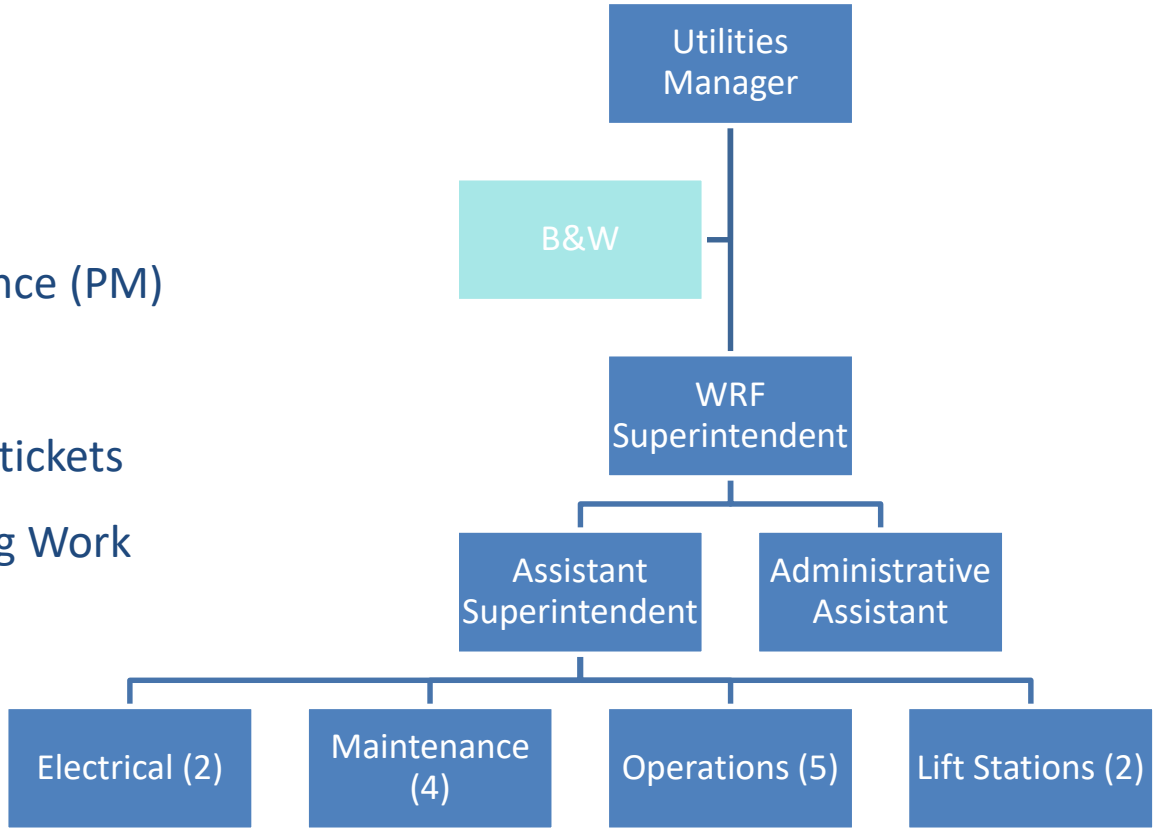
- 898,000 LF of Water Main
- 2,000 Hydrants
- 3,000 Valves
- 3 Interconnects with DuPage Water Commission
- 3,000 Sanitary Structures
- 765,000 LF of Sewer Pipe

City of Elmhurst

Water Production & Wastewater Treatment

Current Operations

- 16 Staff Members
- Preventative Maintenance (PM) on over 900 assets
- No longer using paper tickets for assigning and tracking Work Orders

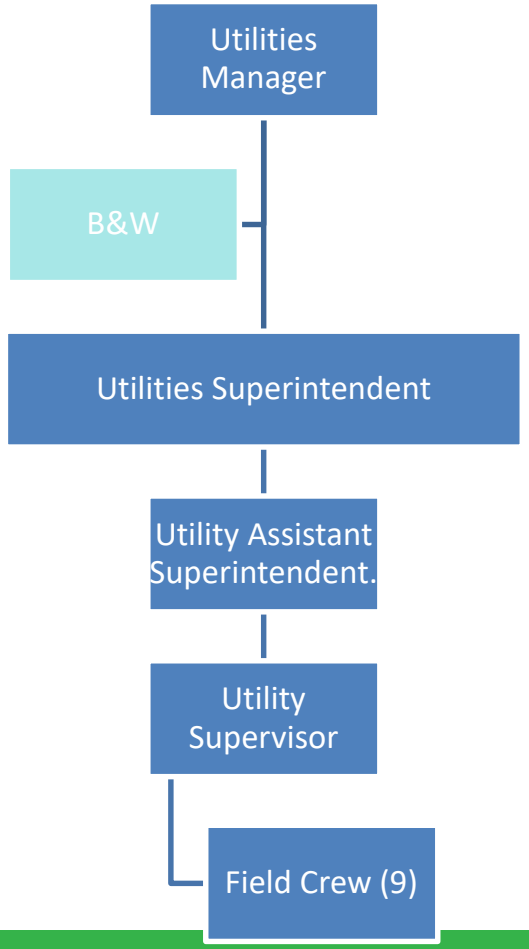


City of Elmhurst

Water Distribution & Sanitary Collection

Current Operations

- 18 Staff Members
- FOG Inspections
- MACP and PACP inspections
- Sewer Televising Videos
- GIS Integration
- AMRs
- Hydrant, Valve and Watermain Maintenance



City's CMMS Software

Many other **CMMS Software** options:

Cityworks Empowering GIS

SystemView

eWork Orders

Fiix

Lucity, Inc.

lucity

- Founded in 2000 as GBA Master Series, Inc.
- Based in Overland Park, Kansas
- Comprised of several modules tailored to Public Works CMMS Solutions
- Offers GIS Integration
- Android/iOS Mobile Support

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City´s CMMS Software

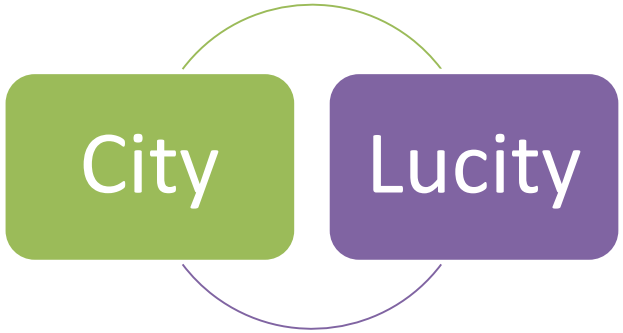
Lucity, Inc. Modules:

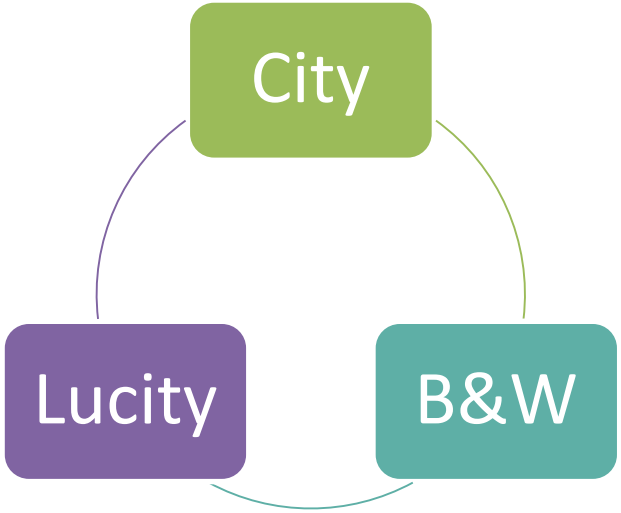
- Equipment (Fleet, Facility, Plants)
- Parks & Recreation (Trees, Inspections)
- Sewer (Structures, Pipes, Valves, MACP, PACP, etc)
- Environmental Compliance (FOG, Pre-treatment Programs)
- Storm (Structures, Pipes, Valves, BMPs, etc)
- Street (Roads, Right of Ways, Accidents, Bridges, etc)
- Water (Hydrants, Valves, Flushing, Raw Water, etc)
- Work (Inventory Management, Work Requests, Work Orders, PMs)

City´s CMMS Software

CMMS at the City of Elmhurst

- Migrated into “Lucity” from “Maintenance View” in 2013
- Complications at initial implementation
- Baxter & Woodman has provided implementation support





Implementation and Startup

for the

Water Production & Wastewater Treatment Division

CITY OF ELMHURST

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Elmhurst, IL 60126

Setup – WRF, Sanitary, Storm, and Water Production

Implementation Plan

Step 1: BONES

- Asset Inventory Collection

Step 2: MUSCLE

- Preventative Maintenance Setup

Step 3: BRAINS

- Internal Workflow, Tablets, and Training

Step 1: Asset Collection

Assets - Accurate and standardized data is key

Issues:

- Existing assets were not updated, decommissioned, or removed
- Existing information on assets was incorrect or incomplete
- There were no standards for naming, grouping, or consistent attribute collection
- New assets were not being entered

Step 1: Asset collection

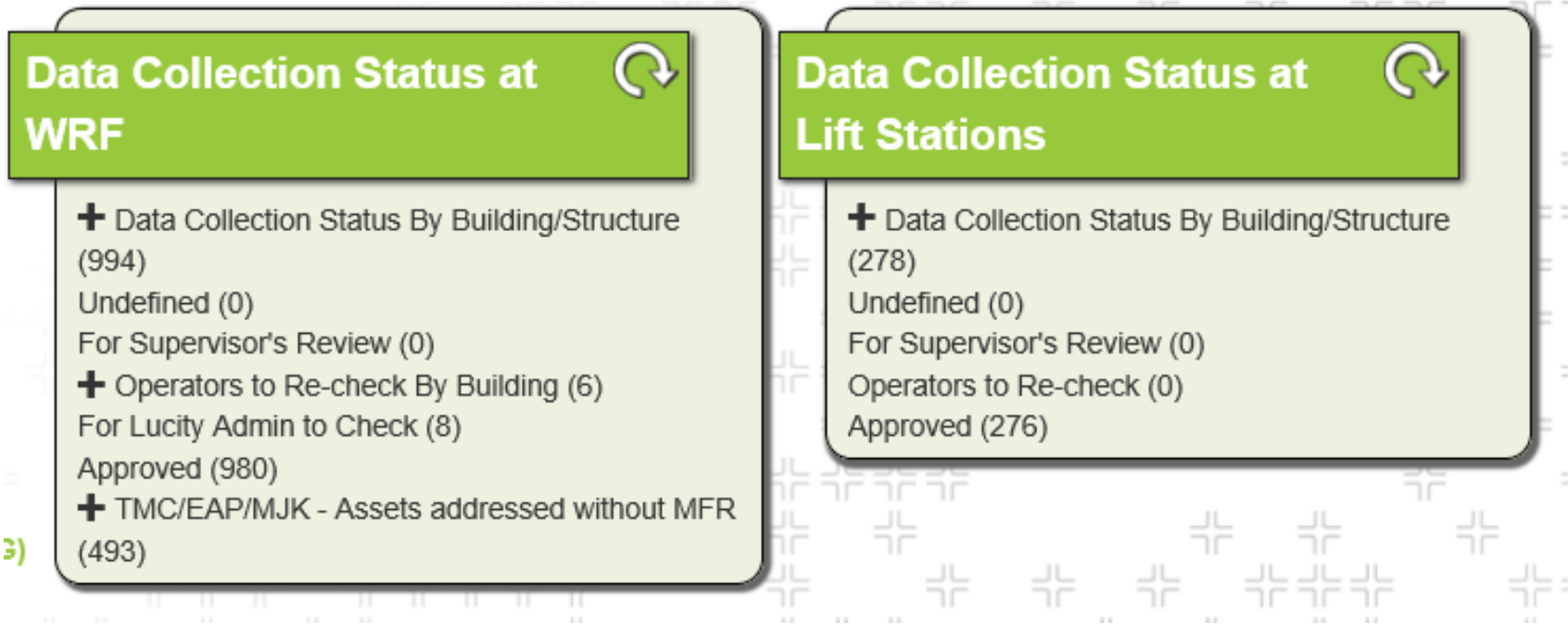
Assets - Accurate and standardized data is key

Solution: Verifying existing assets and collecting new ones

- B&W worked with operators and supervisors to **collect and verify existing information for 1000 assets** using mobile tablets
- Supervisors provided input on **required attributes** and **established SOPs** for adding new assets
- **Standardized names** for the new assets.

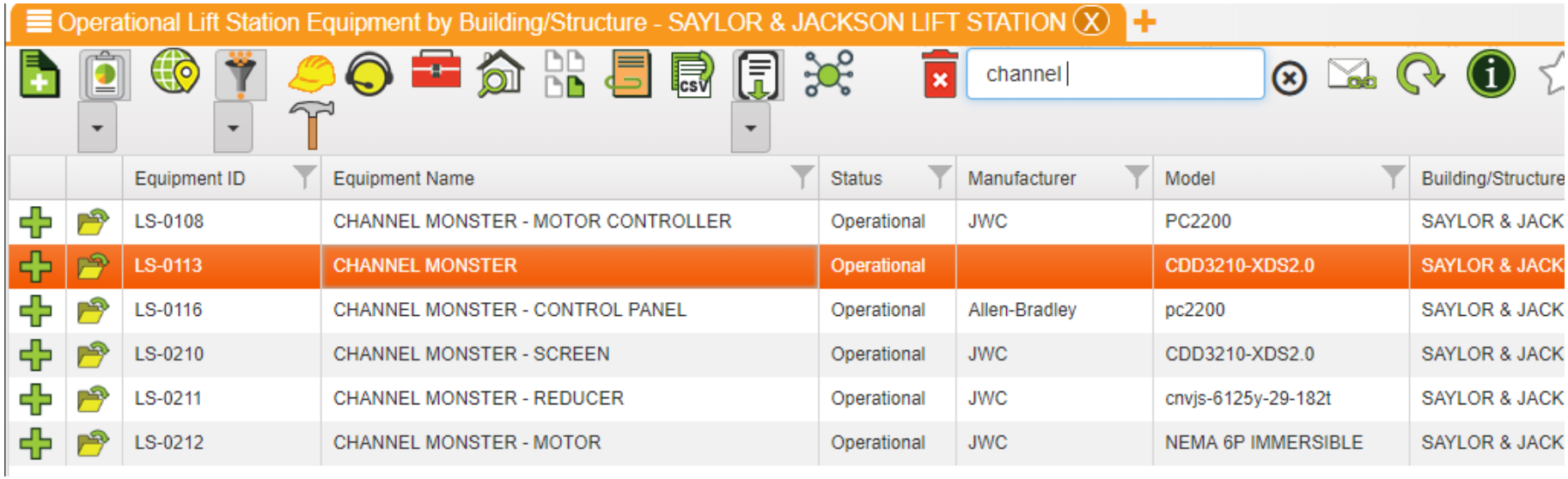
Step 1: Asset collection

Progress Tracking Tools



Step 1: Asset collection

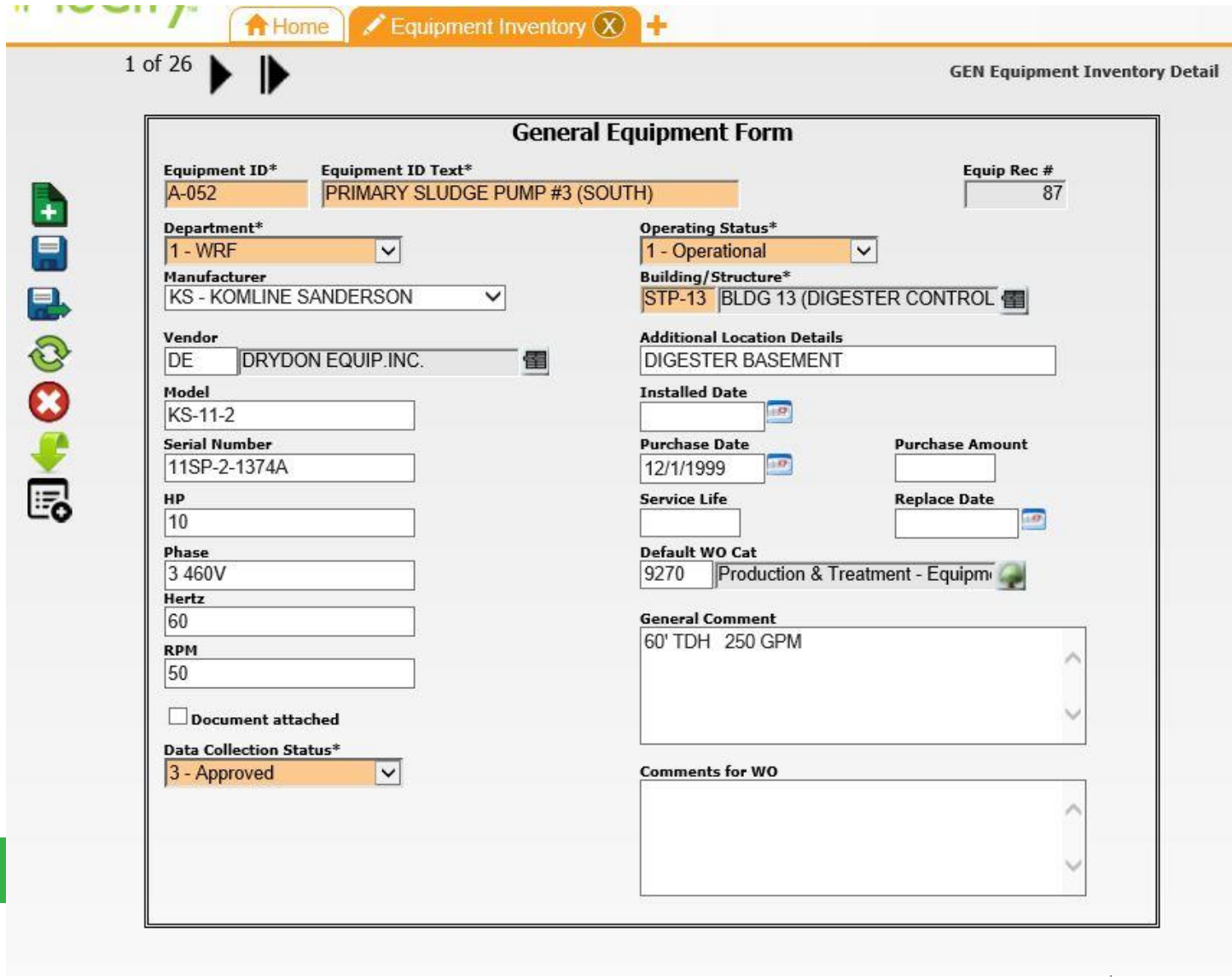
Supervisor determines level of break-down



Equipment ID	Equipment Name	Status	Manufacturer	Model	Building/Structure
LS-0108	CHANNEL MONSTER - MOTOR CONTROLLER	Operational	JWC	PC2200	SAYLOR & JACK
LS-0113	CHANNEL MONSTER	Operational		CDD3210-XDS2.0	SAYLOR & JACK
LS-0116	CHANNEL MONSTER - CONTROL PANEL	Operational	Allen-Bradley	pc2200	SAYLOR & JACK
LS-0210	CHANNEL MONSTER - SCREEN	Operational	JWC	CDD3210-XDS2.0	SAYLOR & JACK
LS-0211	CHANNEL MONSTER - REDUCER	Operational	JWC	cnvjs-6125y-29-182t	SAYLOR & JACK
LS-0212	CHANNEL MONSTER - MOTOR	Operational	JWC	NEMA 6P IMMERSIBLE	SAYLOR & JACK

Step 1: Asset collection

Equipment Form



CLOSE TO EVERYTHING,
Unlike Anything

Step 2: Preventive Maintenance (PM) Setup

PM – Tracking work without impacting efficiency

Issues:

- Preventative Maintenance setup was inefficient.
- PM tickets were originally created to generate as many work orders as tasks, even for those tasks that should occur concurrently within the same work order.
- This would cause operators to have to revisit the equipment several days, as different tickets would generate, in order to complete all the PM tasks.
- Work orders were being printed and collected on paper.

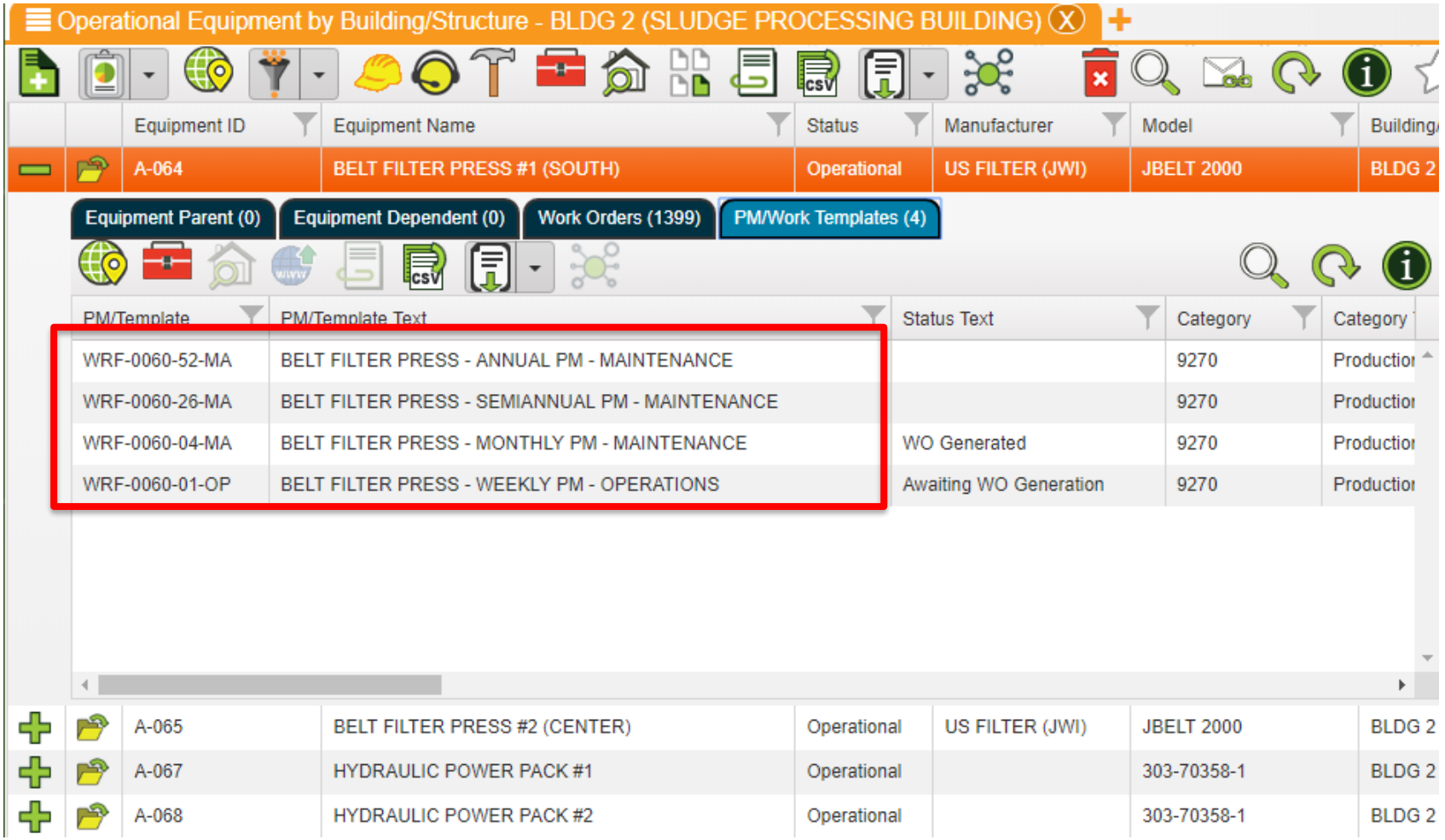
Step 2: Preventive Maintenance (PM) Setup

PM – Tracking work without impacting efficiency

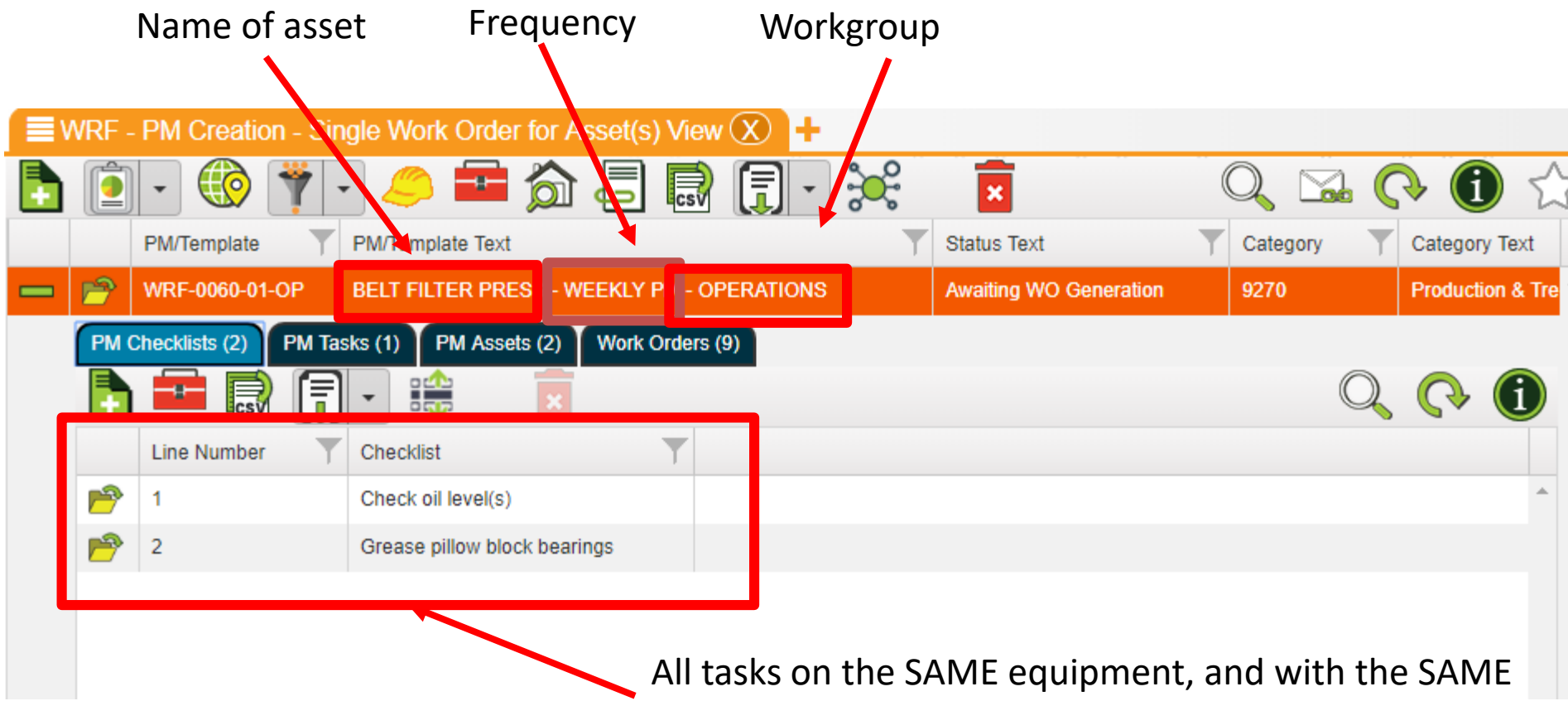
Solution:

- B&W worked with Operators and Supervisors to consolidate the PM tickets for over 1000 assets
- Maintenance crew provide key insight to distill O&Ms into the required steps.
- Like assets, establishing standardized PMs is critical
  - Creating PMs for weekly, monthly, annual tasks on the same asset
  - Utilizing weeks, PMs can be scheduled to fall on a Monday consistently
  - Tracking time on the overall Work Order vs the individual tasks
  - All the tasks due with the same frequency in a single ticket

Step 2: Preventative Maintenance (PM) Setup



Step 2: Preventative Maintenance (PM) Setup



Step 3: Internal Workflow, Tablets, and Training

Work orders – Create simple yet customized dashboards

Issues:

- Originally the City staff was using paper tickets. It was up to the supervisor to transfer those hours and comments from the paper into the CMMS.
- There was no system in place other than the paper to track on-hold tickets or third party repairs
- It was hard to track employee workload and use performance metrics, such as aging of the work orders.
- There were “too many clicks” to access any information

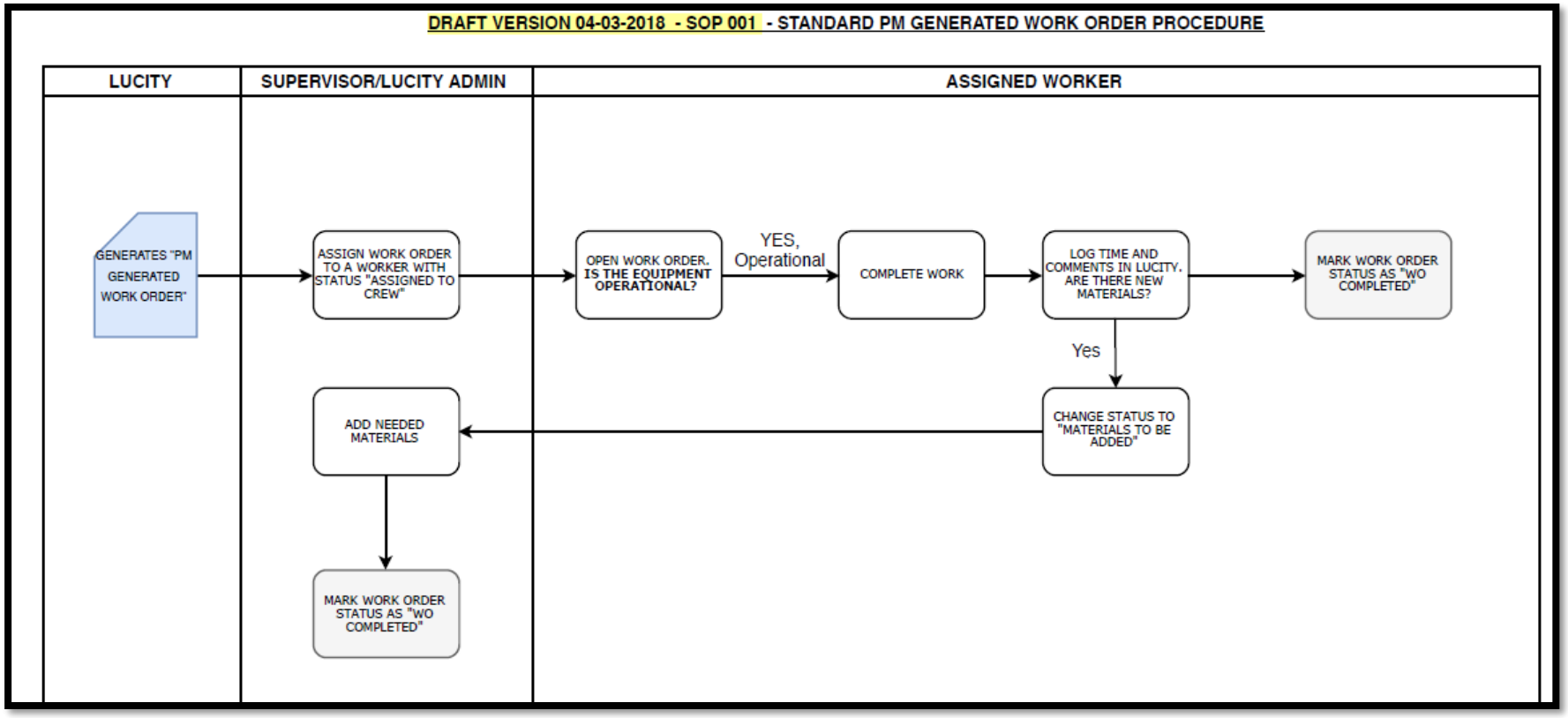
Step 3: Internal Workflow, Tablets, and Training

Work orders – Create simple yet customized dashboards

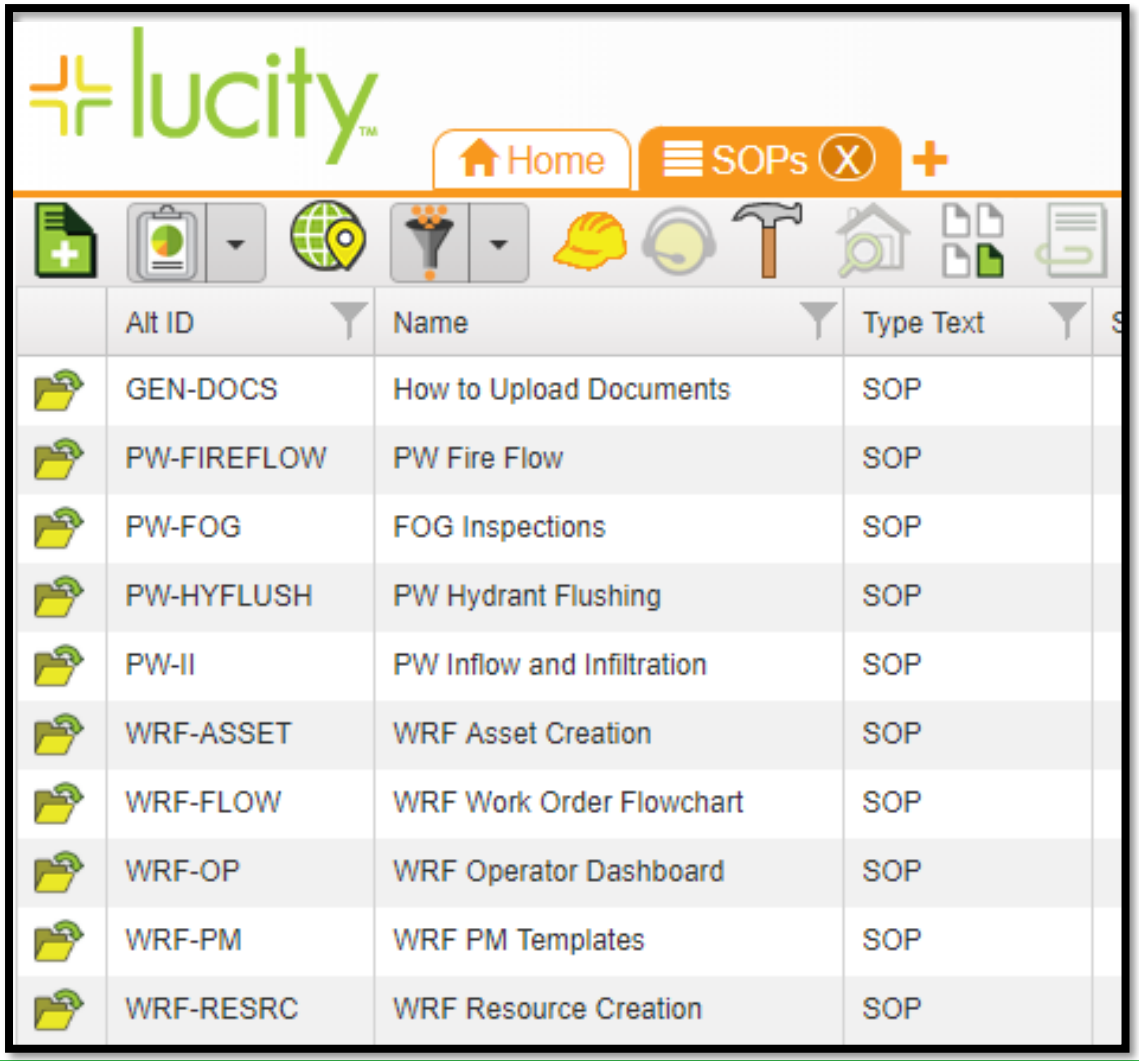
Solution:

- Set up tablets with the Mobile CMMS app.
- Work with Supervisors to develop SOP on how to track different workflow situations (3rd party repairs, out-of-service equipment, parts missing…)
- Provide hands-on training for Supervisors and Operators
- Create customized interfaces for Supervisors with managerial and QA/QC tools
- Create a simplified “My Work” dashboard for Operators to streamline workflow
- Simplify tracking of PM tickets vs. Service Requests by Workgroup and Division

SOP Workflow Example

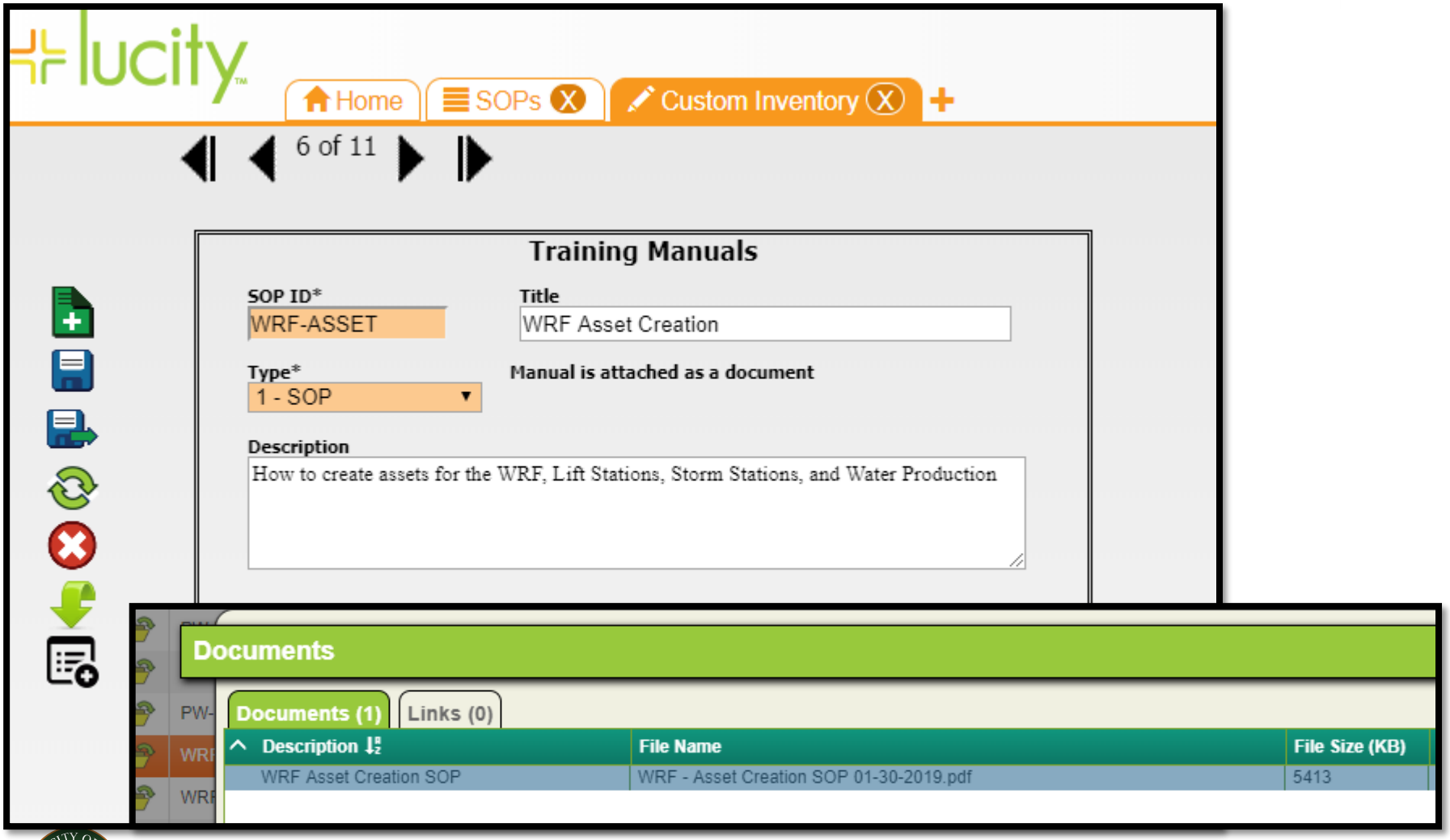


Access to CMMS Trainings and SOP

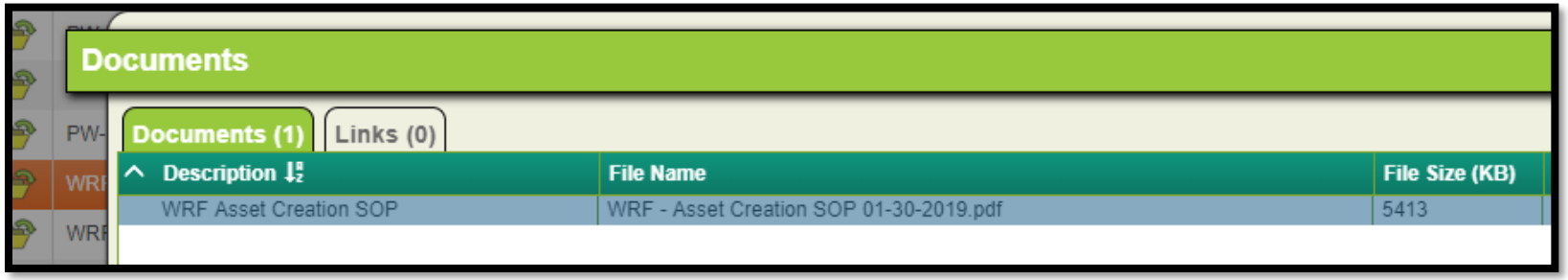


	Alt ID	Name	Type Text
	GEN-DOCS	How to Upload Documents	SOP
	PW-FIREFLOW	PW Fire Flow	SOP
	PW-FOG	FOG Inspections	SOP
	PW-HYFLUSH	PW Hydrant Flushing	SOP
	PW-II	PW Inflow and Infiltration	SOP
	WRF-ASSET	WRF Asset Creation	SOP
	WRF-FLOW	WRF Work Order Flowchart	SOP
	WRF-OP	WRF Operator Dashboard	SOP
	WRF-PM	WRF PM Templates	SOP
	WRF-RESRC	WRF Resource Creation	SOP

Access to CMMS Trainings and SOP



Access to CMMS Trainings and SOP



Lucity How-To: Asset Creation

Contents

Glossary

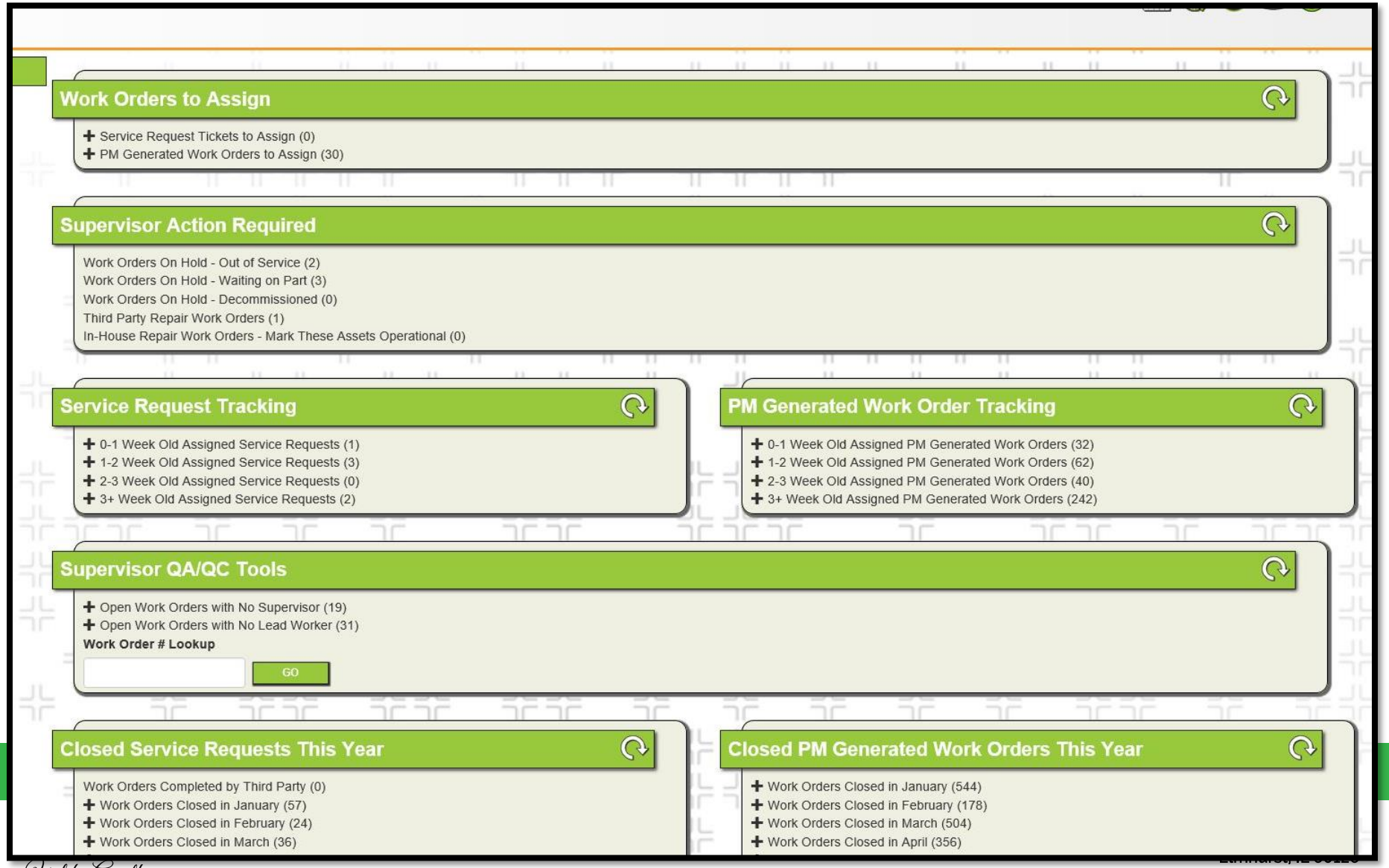
Lucity Web

- Asset Creation Dashboard
- Creating Equipment
- Creating a Pump Station
- Creating a Pump
- Attaching a Pump to a Pump Station

Lucity Mobile

- Asset Creation Dashboard
- Creating Equipment
- Attaching a Child Asset to a Parent Asset
- Creating a Pump
- Creating a Pump Station
- Attaching a Pump to a Pump Station

Supervisor's Dashboard



Supervisor's Dashboard

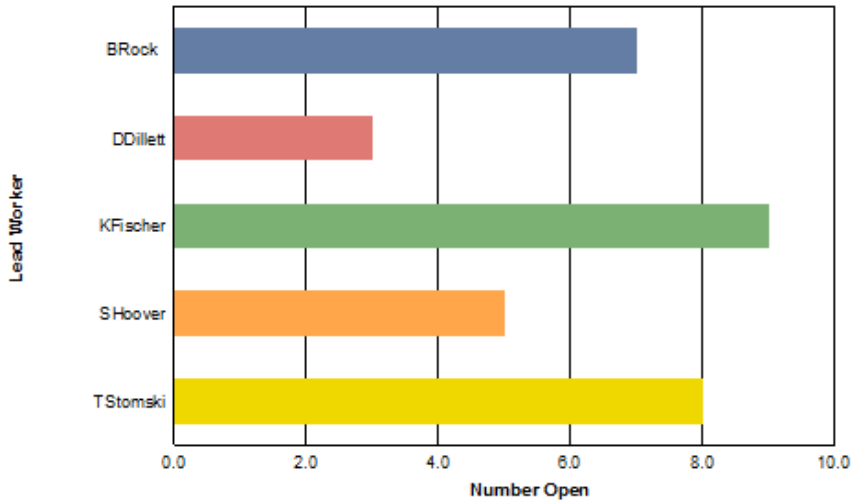
Closed PM Generated Work Orders This Year

- ✚ Work Orders Closed in January (544)
- ✚ Work Orders Closed in February (178)
- ✚ Work Orders Closed in March (504)
- ➖ Work Orders Closed in April (352)
  - ✚ Admin (1)
  - ✚ Electrical (65)
  - ✚ Lift Stations (72)
  - ✚ Maintenance (124)
  - ✚ Operations (43)
  - ✚ Water Production/Lift Stations (47)

Open Work Orders

Open Work Orders by Lead Worker

Lead Code	Lead Worker	# Open
BRock	Brad Rock	7
DDillett	Dan Dillett	3
KFischer	Kirk Fischer	9
SHoover	Steve Hoover	5
TStomski	Tomasz Stomski	8



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Operator's Dashboard

CLOSE TO EVERYTHING,
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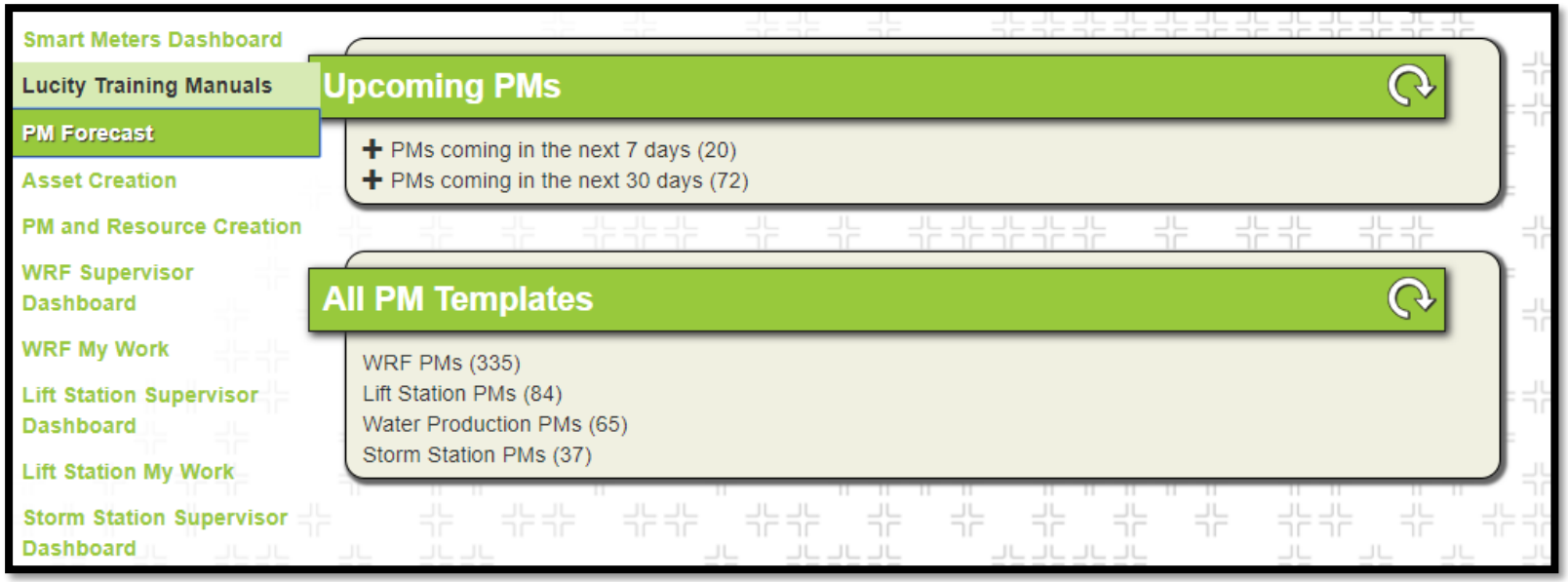
Preventive Maintenance Forecasting Tools



In conclusion

CMMS Requires Teamwork and Continued Efforts

Image Courtesy of: http://aib.edu.au/blog/teamwork/teamwork-is-important-in-the-workplace/?

CMMS Takeaways

Garbage In = Garbage Out

- Top to Bottom Involvement
  - Managerial input to guide information collection
  - Operator/staff input to determine user interface and maintenance plans
- CMMS Upkeep
  - Quality and standardization of data is key to provide useful reports
  - Asset Directors and CMMS Admins provide long-term sustainability
- IT/GIS Support to keep data connected
  - SQL Database
  - ESRI Partner – ArcGIS Support

Future Steps

For WRF, Water Production, Storm and Sanitary Stations

- As new construction projects occur, City requesting contractor to provide CMMS Info sheets
- Systematic upload of drawings and O&Ms

For underground utilities

- Proper interfacing with GIS (AGOL) occurring this year
- Pre-treatment & I/I program reporting

Questions?

Thanks!

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