Improving the STO Process to Drive Competitive Advantage

April 25th, 2023

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Agenda

- Introduction to Prometheus Group
- Trends in the Shutdown, Turnaround, & Outage Space
- Common Challenges and Gaps
- The Prometheus STO Suite Advantages
- Key Modules
- Demonstration
- Questions

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Prometheus Group

- Founded in 1998
- Headquartered in Raleigh, NC, USA
- 21 global offices
- Integrated and intuitive software
- Partnerships with industry leading companies

TOP 10
Oil & Gas

TOP 8
Mining & Metals

TOP 8
Pulp & Paper

TOP 8
Utilities

TOP 6
Chemical

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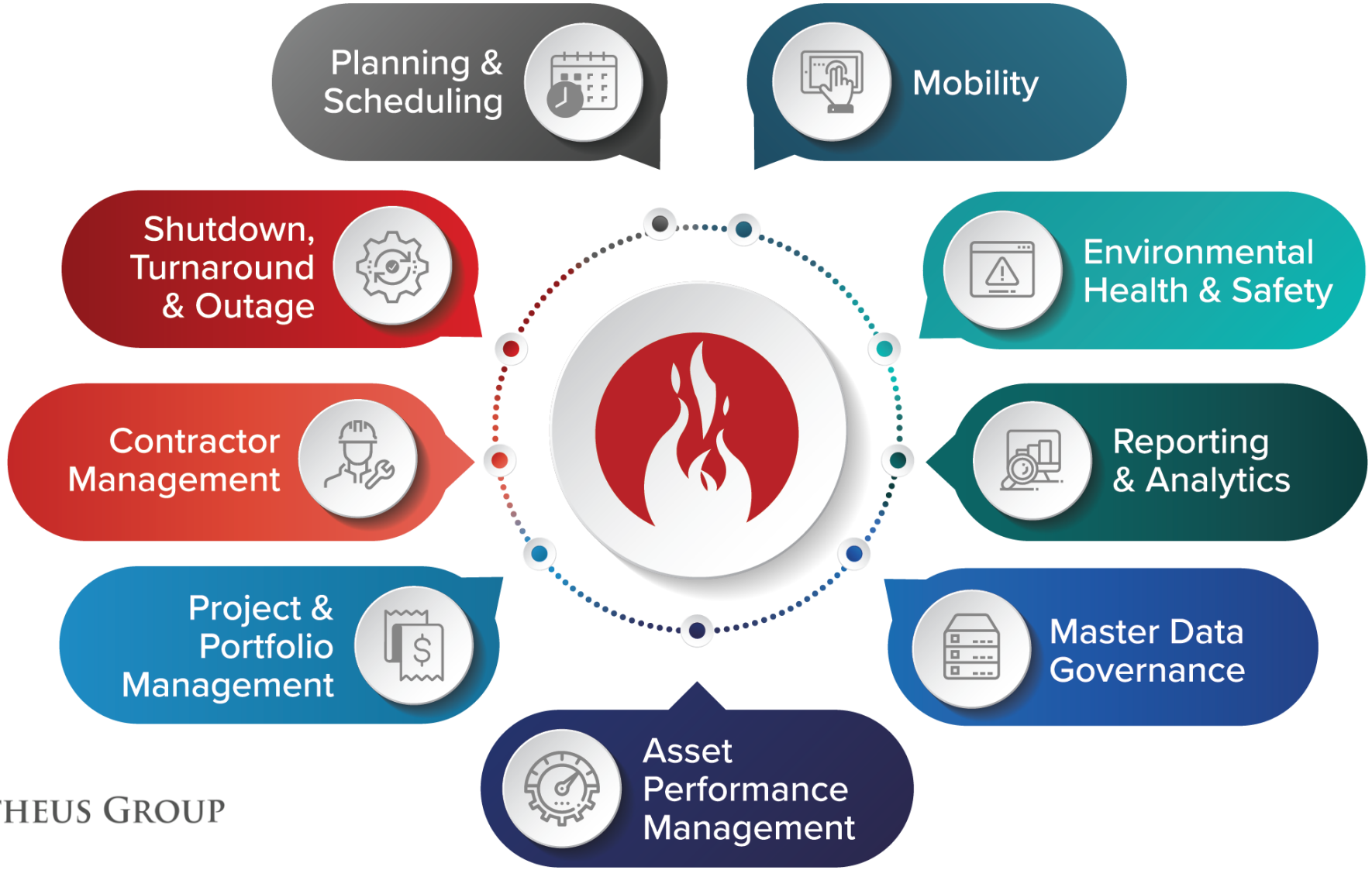
SAP® Certified
Integration with SAP S/4HANA®

ORACLE Gold Partner

IBM Business Partner

The Prometheus Platform



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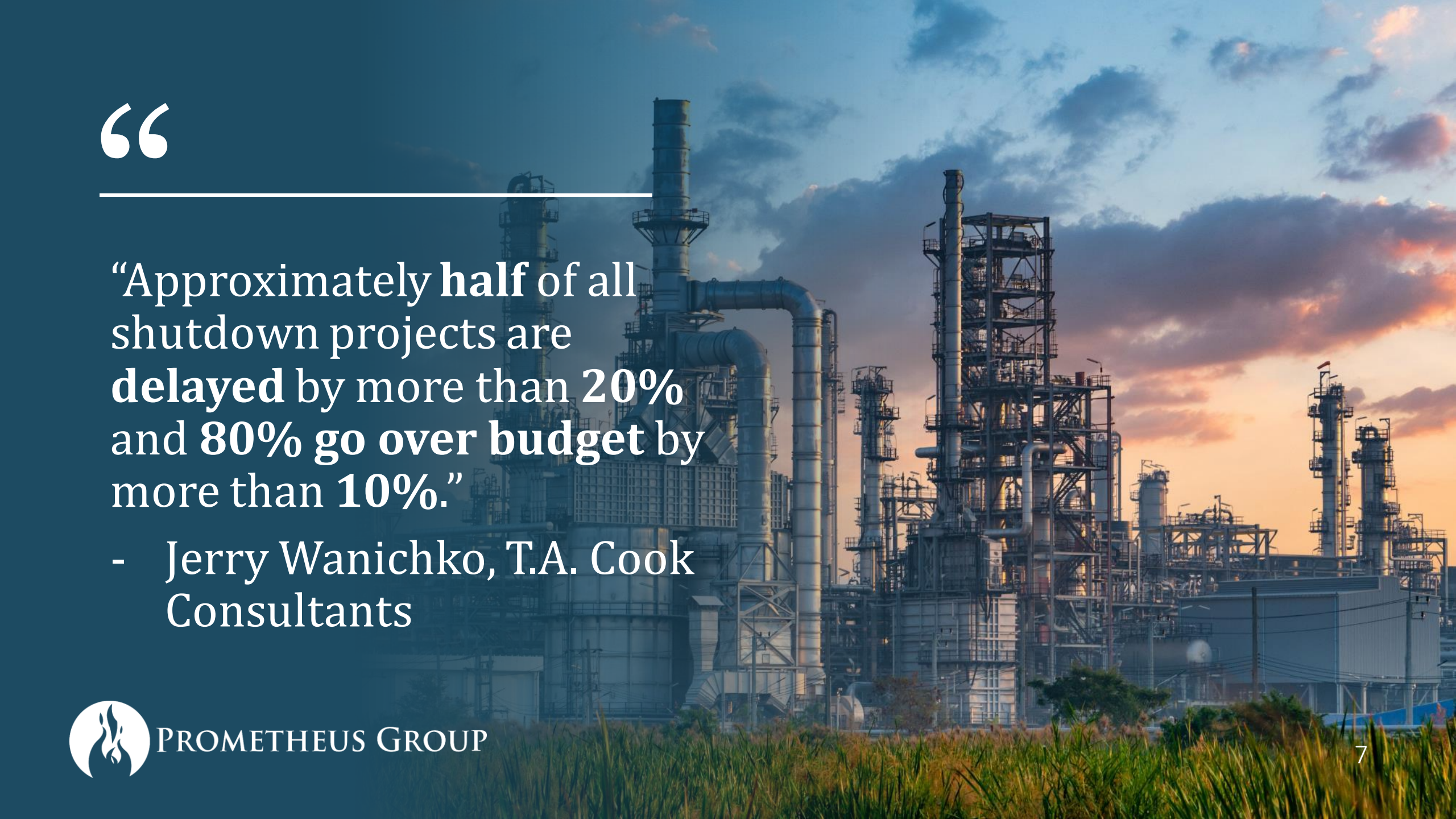
Key Customers



“

“Approximately **half** of all shutdown projects are **delayed** by more than **20%** and **80% go over budget** by more than **10%**.”

- Jerry Wanichko, T.A. Cook Consultants

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Common Challenges & Gaps

- Lack of established centralized system for communication and data capture
- Unclear processes that are difficult to enforce
  - Floating Scope and Work Package Freeze
  - Silo'd systems and excel sheets
  - Lack of consistency across sites or from event to event
- No clear understanding of the "Plan-of-the-Plan"

Culture Over Tools

- There should always be top-down cultural buy-in for any new processes, even if they are simply an improvement to current state
- Competitive advantage is realized when folks are united with common goals that are reinforced with common systems
- Always keep user adoption and clear messaging on the forefront of any STO Project

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Prometheus STO Suite Advantages

- Direct integration with EAM, CMMS, ERP
  - Elimination of duplicate work and data silos
- Configurability to adapt processes from multiple work groups
  - Flexibility to accommodate and grow current processes
  - No “one-size-fits-all” approach
- Establish accountability for individuals and groups
- Communication of project status and information for all stakeholders, even external resources

STO Planning for SAP

Scope Management

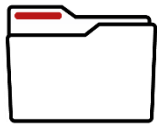
Robust, configurable approval for generating and managing STO scope. Integrates with your ERP system to convert routine work into STO work.

Planning Progress Tracking

Transform your turnaround planning from “gut feeling” to data driven. Know that your plant is ready for your upcoming STO.

Materials Management

Request, approve, and track materials for your STO. Integrates with your ERP system to provide real-time status.



QA/QC Packages

Minimize production system downtime by building and tracking QA/QC package completion.

Inspection Planning & Execution

Prepare for inspection jobs and be ready to handle “discovered” work.

Work Execution

Allow contractors to update and progress your STO schedule from contractor access to maintain data integrity.

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Work Package Planning

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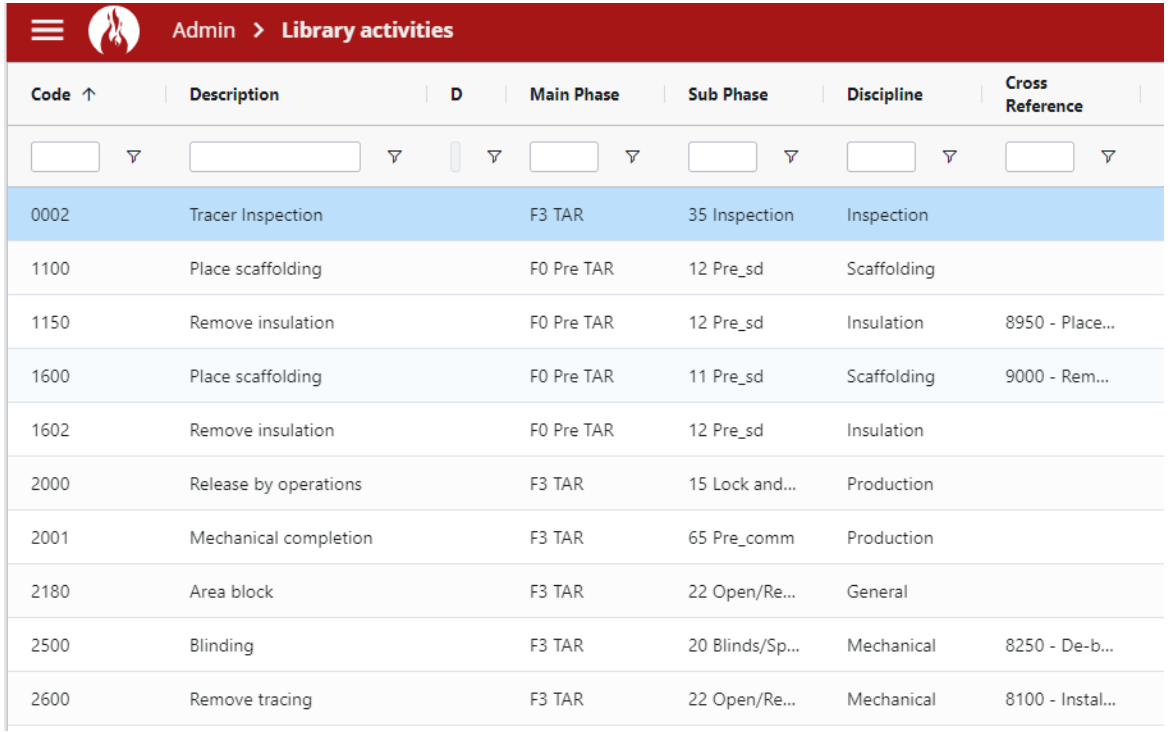
Planning Templates

- Increase
  - Consistency
  - Predictability
  - Flexibility
- **Reduce data entry time**
- Use this room for decision making
- Goal: Capture *slightly more* info than you think you need!
  - Easier to remove unnecessary data, than add something that isn't there!

Templates/Activity Library

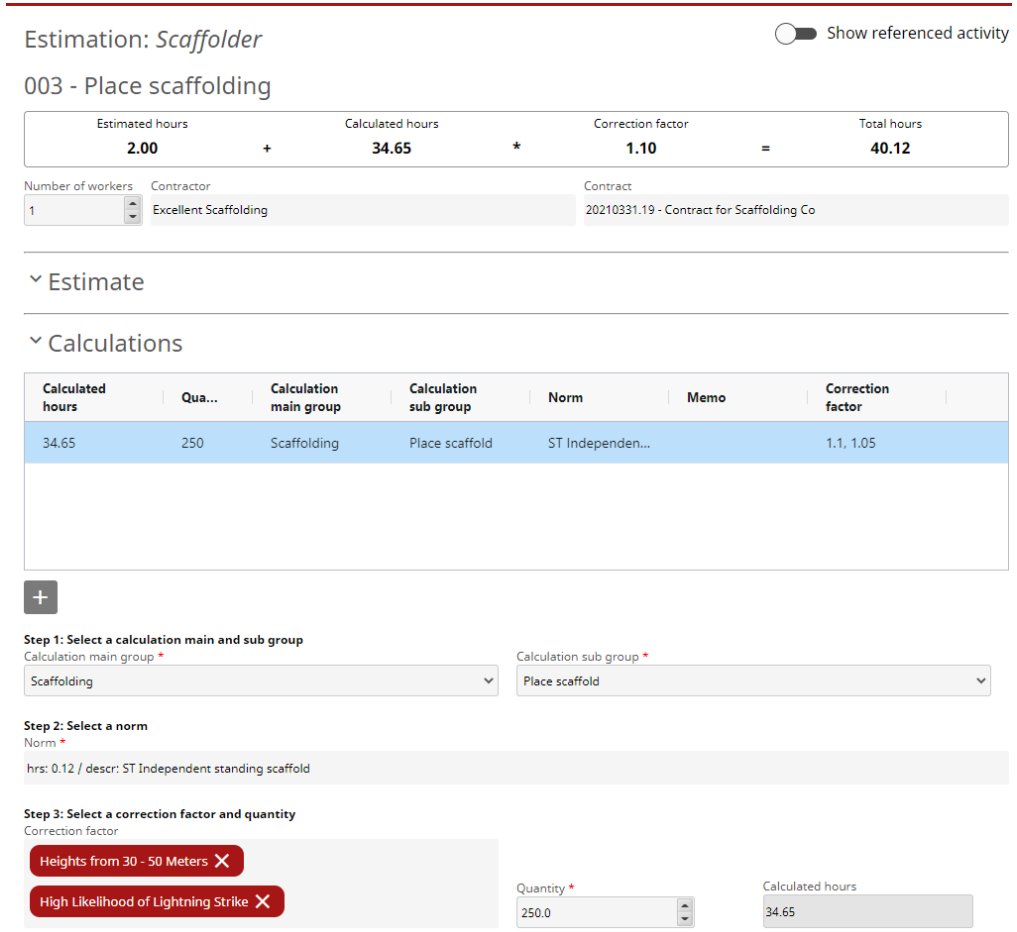
- Templates -> Steps for an entire Work Package
- Activity Library -> Individual, repeatable steps that are commonly used



Code	Description	D	Main Phase	Sub Phase	Discipline	Cross Reference
0002	Tracer Inspection		F3 TAR	35 Inspection	Inspection	
1100	Place scaffolding		F0 Pre TAR	12 Pre_sd	Scaffolding	
1150	Remove insulation		F0 Pre TAR	12 Pre_sd	Insulation	8950 - Place...
1600	Place scaffolding		F0 Pre TAR	11 Pre_sd	Scaffolding	9000 - Rem...
1602	Remove insulation		F0 Pre TAR	12 Pre_sd	Insulation	
2000	Release by operations		F3 TAR	15 Lock and...	Production	
2001	Mechanical completion		F3 TAR	65 Pre_comm	Production	
2180	Area block		F3 TAR	22 Open/Re...	General	
2500	Blinding		F3 TAR	20 Blinds/Sp...	Mechanical	8250 - De-b...
2600	Remove tracing		F3 TAR	22 Open/Re...	Mechanical	8100 - Instal...

Correction Factors

- Account for uncertainty and complexities in activities
- Contractor/Contracts
- Norm/Resource Level



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Execution Management

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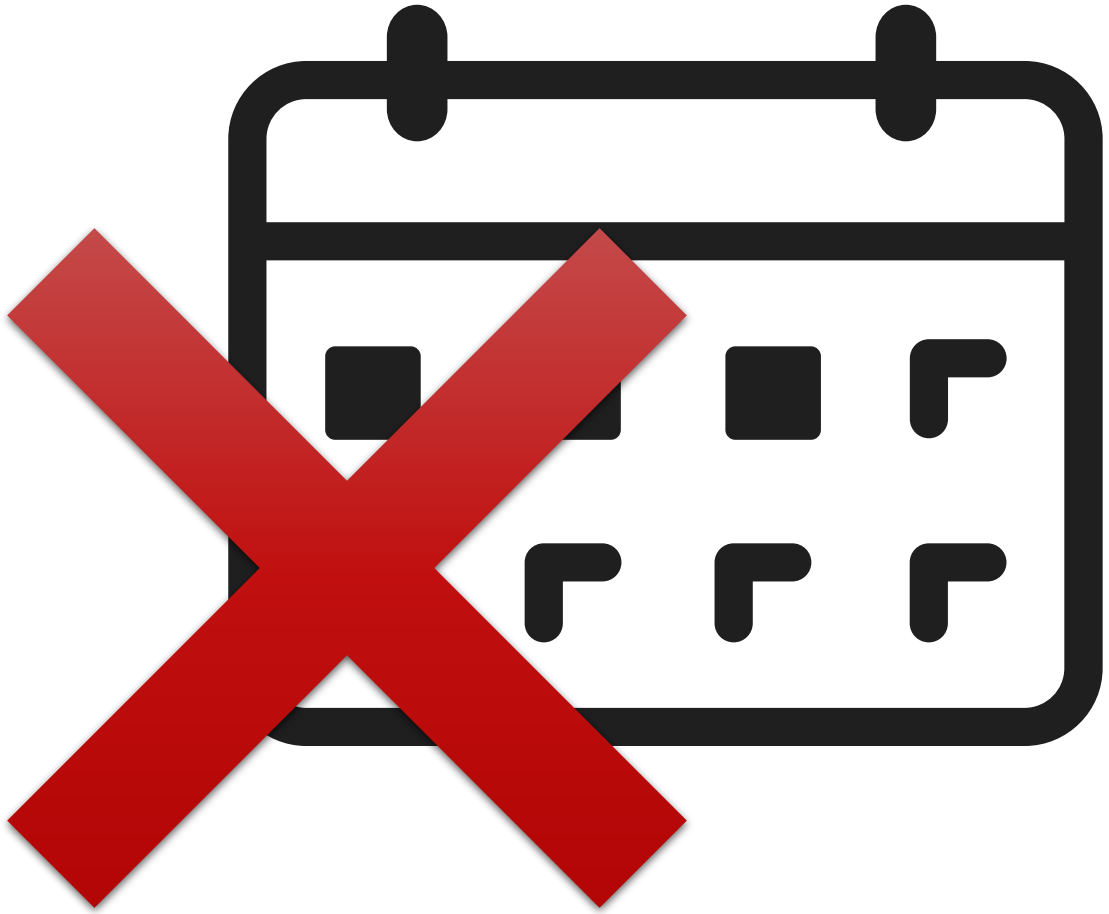
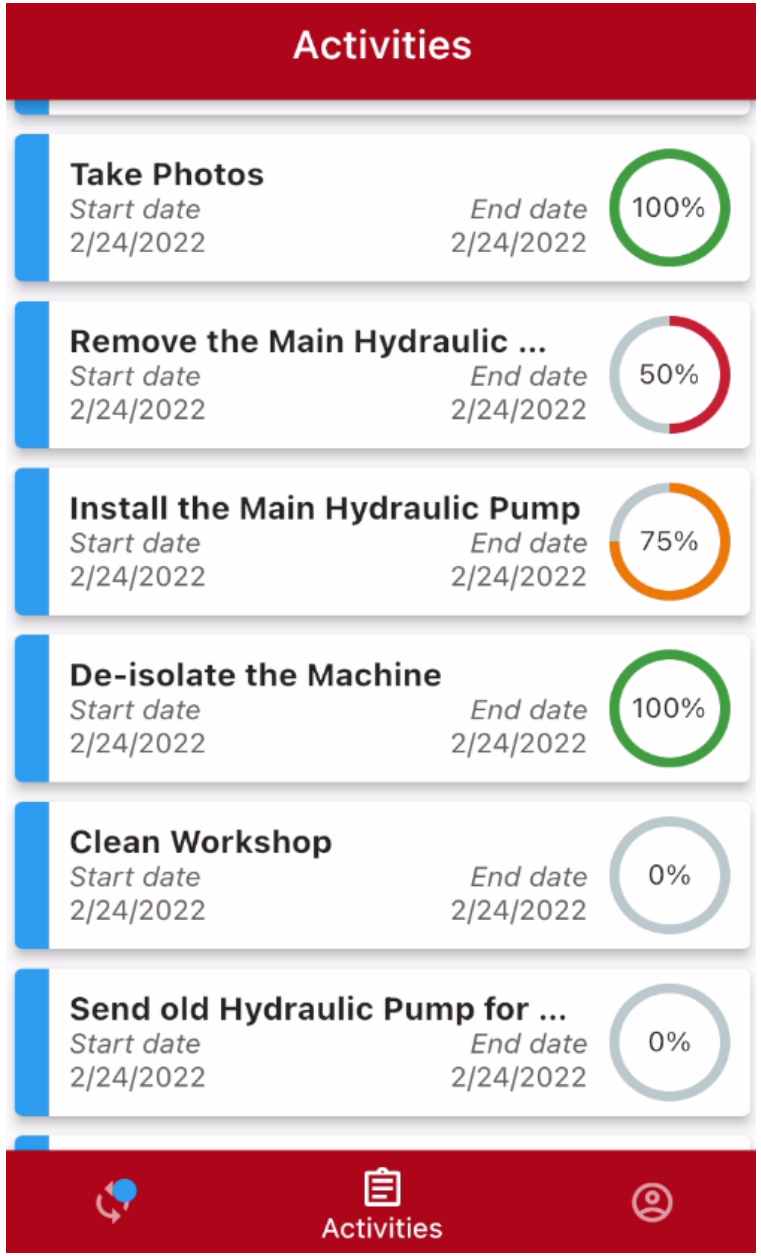
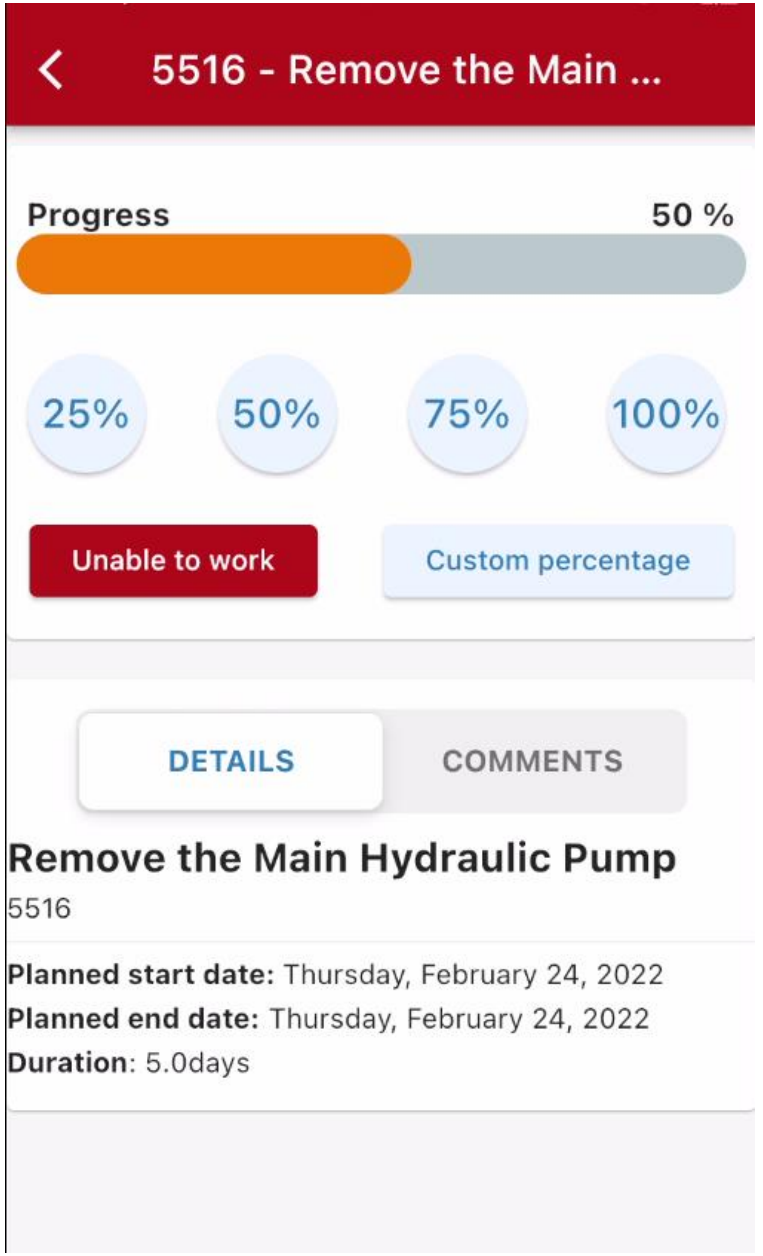
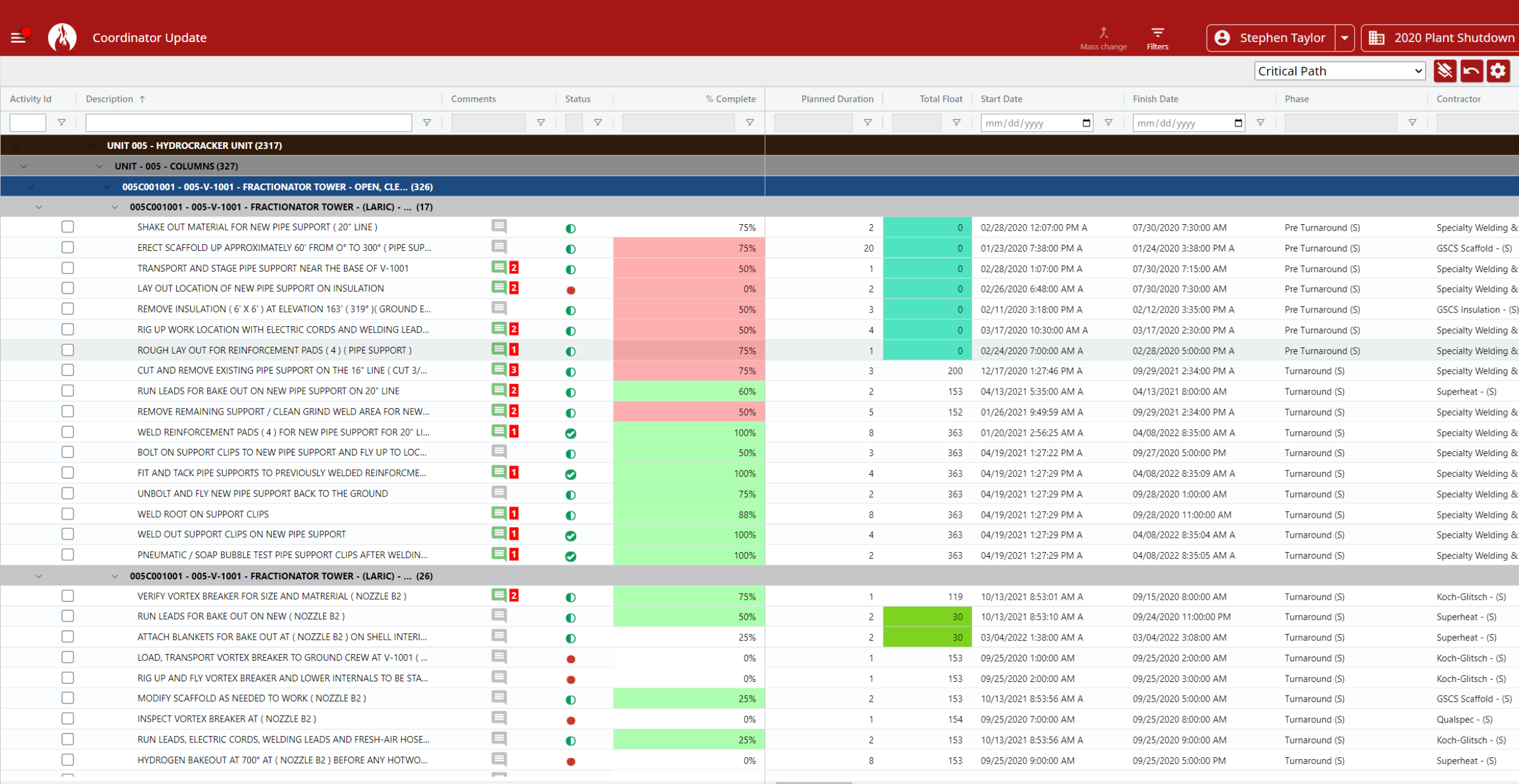
Schedule Integration Challenges

- Multiple sources of the truth across systems
  - “P6 is showing the work at 100% complete, but the order hasn’t even been released in SAP!”
  - “The work order in SAP is scheduled for Mid-July, but I don’t even see it on our P6 Schedule”

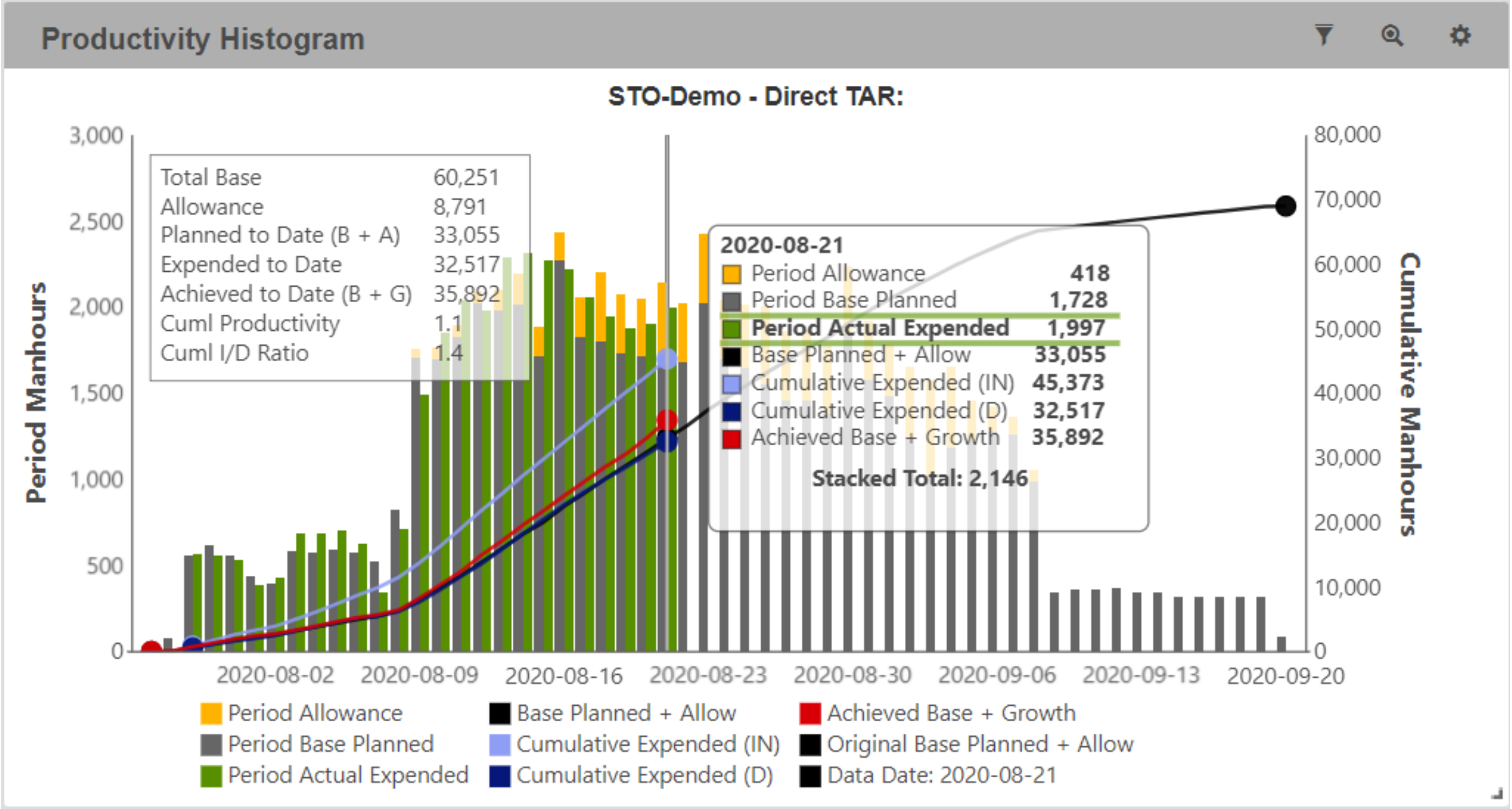



Activities
Take Photos
Start date
2/24/2022
End date
2/24/2022
100%
Remove the Main Hydraulic ...
Start date
2/24/2022
End date
2/24/2022
50%
Install the Main Hydraulic Pump
Start date
2/24/2022
End date
2/24/2022
75%
De-isolate the Machine
Start date
2/24/2022
End date
2/24/2022
100%
Clean Workshop
Start date
2/24/2022
End date
2/24/2022
0%
Send old Hydraulic Pump for ...
Start date
2/24/2022
End date
2/24/2022
0%
Activities


5516 - Remove the Main ...
Progress
50 %
25%
50%
75%
100%
Unable to work
Custom percentage
DETAILS
COMMENTS
Remove the Main Hydraulic Pump
5516
Planned start date: Thursday, February 24, 2022
Planned end date: Thursday, February 24, 2022
Duration: 5.0days



Activity Id	Description	Comments	Status	% Complete	Planned Duration	Total Float	Start Date	Finish Date	Phase	Contractor
	UNIT 005 - HYDROCRACKER UNIT (2317)									
	UNIT - 005 - COLUMNS (327)									
	005C001001 - 005-V-1001 - FRACTIONATOR TOWER - OPEN, CLE... (326)									
	005C001001 - 005-V-1001 - FRACTIONATOR TOWER - (LARIC) - ... (17)									
	SHAKE OUT MATERIAL FOR NEW PIPE SUPPORT (20" LINE)			75%	2	0	02/28/2020 12:07:00 PM A	07/30/2020 7:30:00 AM	Pre Turnaround (S)	Specialty Welding &
	ERECT SCAFFOLD UP APPROXIMATELY 60' FROM O° TO 300° (PIPE SUP...			75%	20	0	01/23/2020 7:38:00 PM A	01/24/2020 3:38:00 PM A	Pre Turnaround (S)	GSCS Scaffold - (S)
	TRANSPORT AND STAGE PIPE SUPPORT NEAR THE BASE OF V-1001	2		50%	1	0	02/28/2020 1:07:00 PM A	07/30/2020 7:15:00 AM	Pre Turnaround (S)	Specialty Welding &
	LAY OUT LOCATION OF NEW PIPE SUPPORT ON INSULATION	2		0%	2	0	02/26/2020 6:48:00 AM A	07/30/2020 7:30:00 AM	Pre Turnaround (S)	Specialty Welding &
	REMOVE INSULATION (6' X 6') AT ELEVATION 163' (319°)(GROUND E...			50%	3	0	02/11/2020 3:18:00 PM A	02/12/2020 3:35:00 PM A	Pre Turnaround (S)	GSCS Insulation - (S)
	RIG UP WORK LOCATION WITH ELECTRIC CORDS AND WELDING LEAD...	2		50%	4	0	03/17/2020 10:30:00 AM A	03/17/2020 2:30:00 PM A	Pre Turnaround (S)	Specialty Welding &
	ROUGH LAY OUT FOR REINFORCEMENT PADS (4) (PIPE SUPPORT)	1		75%	1	0	02/24/2020 7:00:00 AM A	02/28/2020 5:00:00 PM A	Pre Turnaround (S)	Specialty Welding &
	CUT AND REMOVE EXISTING PIPE SUPPORT ON THE 16" LINE (CUT 3/...	3		75%	3	200	12/17/2020 1:27:46 PM A	09/29/2021 2:34:00 PM A	Turnaround (S)	Specialty Welding &
	RUN LEADS FOR BAKE OUT ON NEW PIPE SUPPORT ON 20" LINE	2		60%	2	153	04/13/2021 5:35:00 AM A	04/13/2021 8:00:00 AM	Turnaround (S)	Superheat - (S)
	REMOVE REMAINING SUPPORT / CLEAN GRIND WELD AREA FOR NEW...	2		50%	5	152	01/26/2021 9:49:59 AM A	09/29/2021 2:34:00 PM A	Turnaround (S)	Specialty Welding &
	WELD REINFORCEMENT PADS (4) FOR NEW PIPE SUPPORT FOR 20" LI...	1		100%	8	363	01/20/2021 2:56:25 AM A	04/08/2022 8:35:00 AM A	Turnaround (S)	Specialty Welding &
	BOLT ON SUPPORT CLIPS TO NEW PIPE SUPPORT AND FLY UP TO LOC...			50%	3	363	04/19/2021 1:27:22 PM A	09/27/2020 5:00:00 PM	Turnaround (S)	Specialty Welding &
	FIT AND TACK PIPE SUPPORTS TO PREVIOUSLY WELDED REINFORCME...	1		100%	4	363	04/19/2021 1:27:29 PM A	04/08/2022 8:35:09 AM A	Turnaround (S)	Specialty Welding &
	UNBOLT AND FLY NEW PIPE SUPPORT BACK TO THE GROUND			75%	2	363	04/19/2021 1:27:29 PM A	09/28/2020 1:00:00 AM	Turnaround (S)	Specialty Welding &
	WELD ROOT ON SUPPORT CLIPS	1		88%	8	363	04/19/2021 1:27:29 PM A	09/28/2020 11:00:00 AM	Turnaround (S)	Specialty Welding &
	WELD OUT SUPPORT CLIPS ON NEW PIPE SUPPORT	1		100%	4	363	04/19/2021 1:27:29 PM A	04/08/2022 8:35:04 AM A	Turnaround (S)	Specialty Welding &
	PNEUMATIC / SOAP BUBBLE TEST PIPE SUPPORT CLIPS AFTER WELDIN...	1		100%	2	363	04/19/2021 1:27:29 PM A	04/08/2022 8:35:05 AM A	Turnaround (S)	Specialty Welding &
	005C001001 - 005-V-1001 - FRACTIONATOR TOWER - (LARIC) - ... (26)									
	VERIFY VORTEX BREAKER FOR SIZE AND MATRERIAL (NOZZLE B2)	2		75%	1	119	10/13/2021 8:53:01 AM A	09/15/2020 8:00:00 AM	Turnaround (S)	Koch-Glitsch - (S)
	RUN LEADS FOR BAKE OUT ON NEW (NOZZLE B2)			50%	2	30	10/13/2021 8:53:10 AM A	09/24/2020 11:00:00 PM	Turnaround (S)	Superheat - (S)
	ATTACH BLANKETS FOR BAKE OUT AT (NOZZLE B2) ON SHELL INTERI...			25%	2	30	03/04/2022 1:38:00 AM A	03/04/2022 3:08:00 AM	Turnaround (S)	Superheat - (S)
	LOAD, TRANSPORT VORTEX BREAKER TO GROUND CREW AT V-1001 (...			0%	1	153	09/25/2020 1:00:00 AM	09/25/2020 2:00:00 AM	Turnaround (S)	Koch-Glitsch - (S)
	RIG UP AND FLY VORTEX BREAKER AND LOWER INTERNALS TO BE STA...			0%	1	153	09/25/2020 2:00:00 AM	09/25/2020 3:00:00 AM	Turnaround (S)	Koch-Glitsch - (S)
	MODIFY SCAFFOLD AS NEEDED TO WORK (NOZZLE B2)			25%	2	153	10/13/2021 8:53:56 AM A	09/25/2020 5:00:00 AM	Turnaround (S)	GSCS Scaffold - (S)
	INSPECT VORTEX BREAKER AT (NOZZLE B2)			0%	1	154	09/25/2020 7:00:00 AM	09/25/2020 8:00:00 AM	Turnaround (S)	Qualspec - (S)
	RUN LEADS, ELECTRIC CORDS, WELDING LEADS AND FRESH-AIR HOSE...			25%	2	153	10/13/2021 8:53:56 AM A	09/25/2020 9:00:00 AM	Turnaround (S)	Koch-Glitsch - (S)
	HYDROGEN BAKEOUT AT 700° AT (NOZZLE B2) BEFORE ANY HOTWO...			0%	8	153	09/25/2020 9:00:00 AM	09/25/2020 5:00:00 PM	Turnaround (S)	Superheat - (S)


Productivity Histogram
STO-Demo - Direct TAR:
Total Base 60,251
Allowance 8,791
Planned to Date (B + A) 33,055
Expended to Date 32,517
Achieved to Date (B + G) 35,892
Cuml Productivity 1.1
Cuml I/D Ratio 1.4
2020-08-21
Period Allowance 418
Period Base Planned 1,728
Period Actual Expended 1,997
Base Planned + Allow 33,055
Cumulative Expended (IN) 45,373
Cumulative Expended (D) 32,517
Achieved Base + Growth 35,892
Stacked Total: 2,146
Period Manhours
Cumulative Manhours
3,000
2,500
2,000
1,500
1,000
500
0
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2020-08-02
2020-08-09
2020-08-16
2020-08-23
2020-08-30
2020-09-06
2020-09-13
2020-09-20
Period Allowance
Period Base Planned
Period Actual Expended
Base Planned + Allow
Cumulative Expended (IN)
Cumulative Expended (D)
Achieved Base + Growth
Original Base Planned + Allow
Data Date: 2020-08-21

Live Demonstration

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Questions?

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