



MASHCo

NEW FACILITIES

HYDRANT PUMP REPLACEMENT PROJECT

JIG TECHNICAL FORUM
ROME 2026



Overview of airport transformation....



Manchester Airport has undertaken a significant transformation project since 2018 which has seen the expansion of Terminal 2.

Terminal 2 was limited to a small number of contact stands and a bottle neck taxiway that only allowed aircraft to pass in one direction at a time.

This limited the airports expansion plans and capacity to turn around wide body aircraft efficiently.

Overview of airfield transformation



The airport began its airfield transformation with the construction of Pier 1 which opened in late 2019.

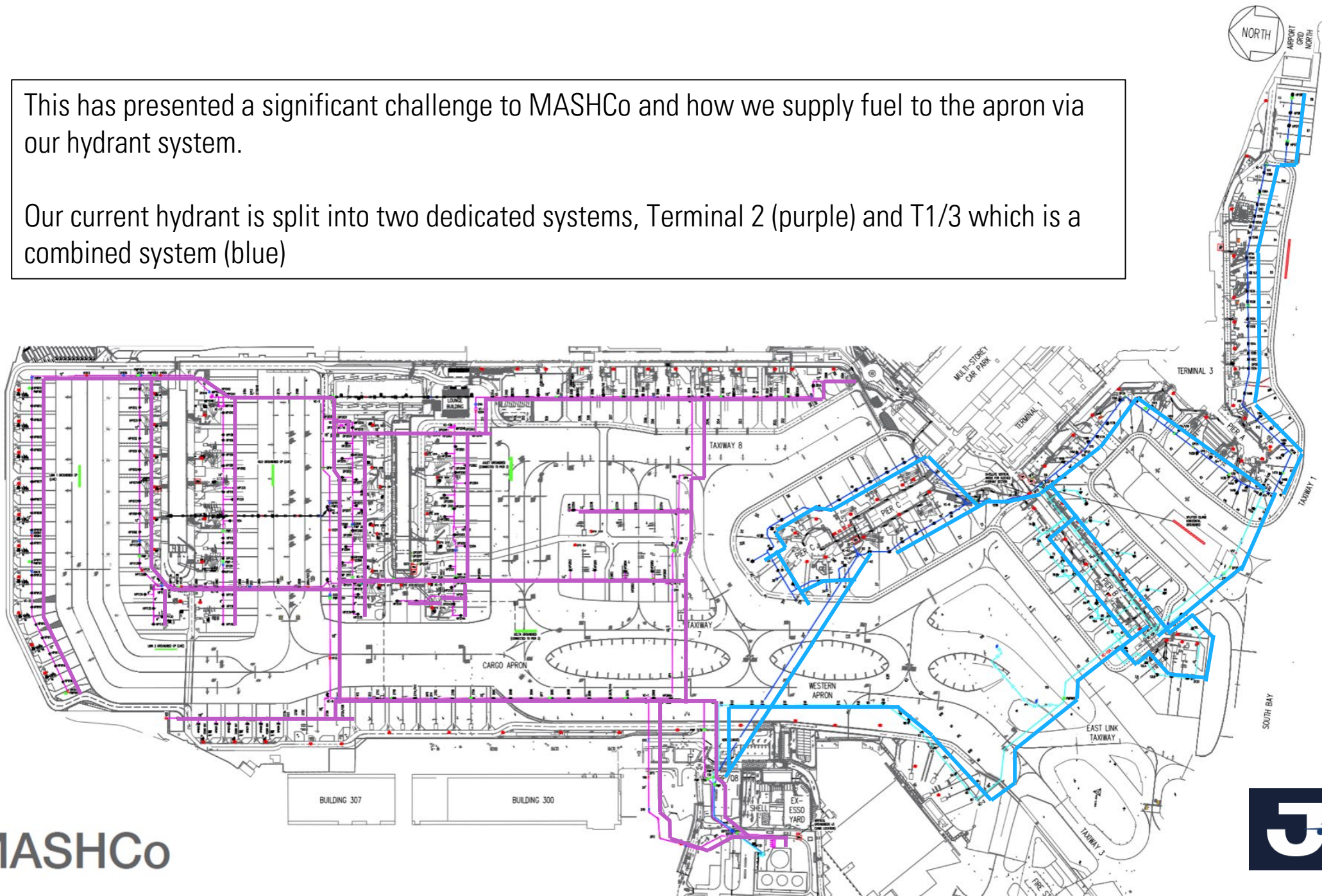
Pier 2 was recently opened in November 2025, which gave the airport more contact stands and critically two Code E / F stands for the terminal.

This has enabled Manchester to close Terminal 1, which 80% of departing aircraft now operating from this terminal.

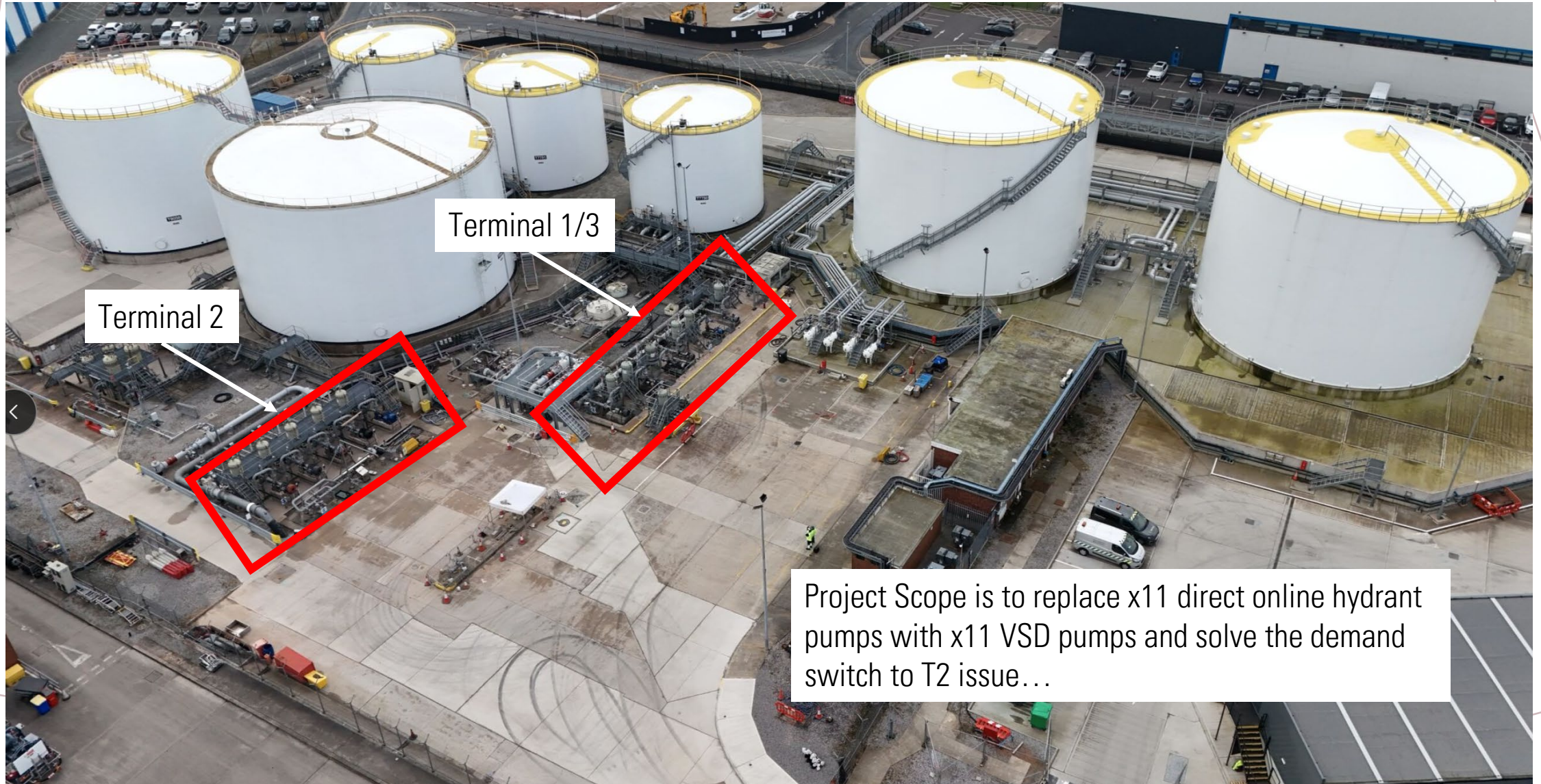
A dual taxiway is also now in operation to increase turnaround efficiency and increase capacity.

This has presented a significant challenge to MASHCo and how we supply fuel to the apron via our hydrant system.

Our current hydrant is split into two dedicated systems, Terminal 2 (purple) and T1/3 which is a combined system (blue)



Existing Terminal 1/3 and Terminal 2 Hydrant Delivery Pumps

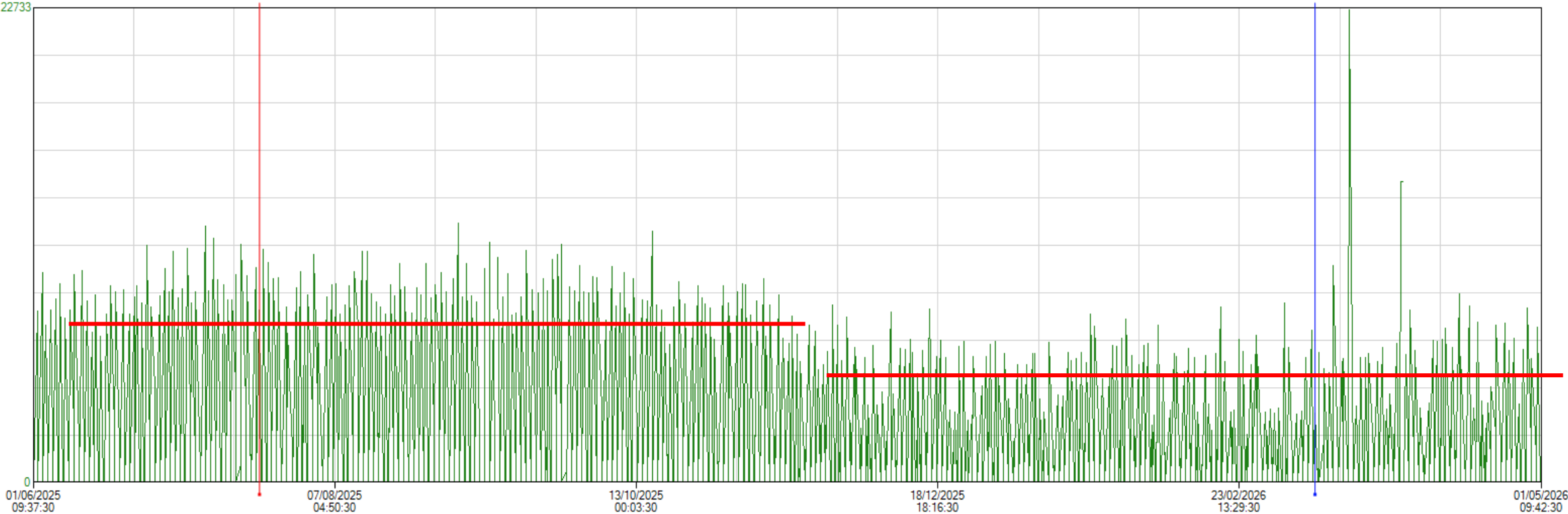


Terminal 2

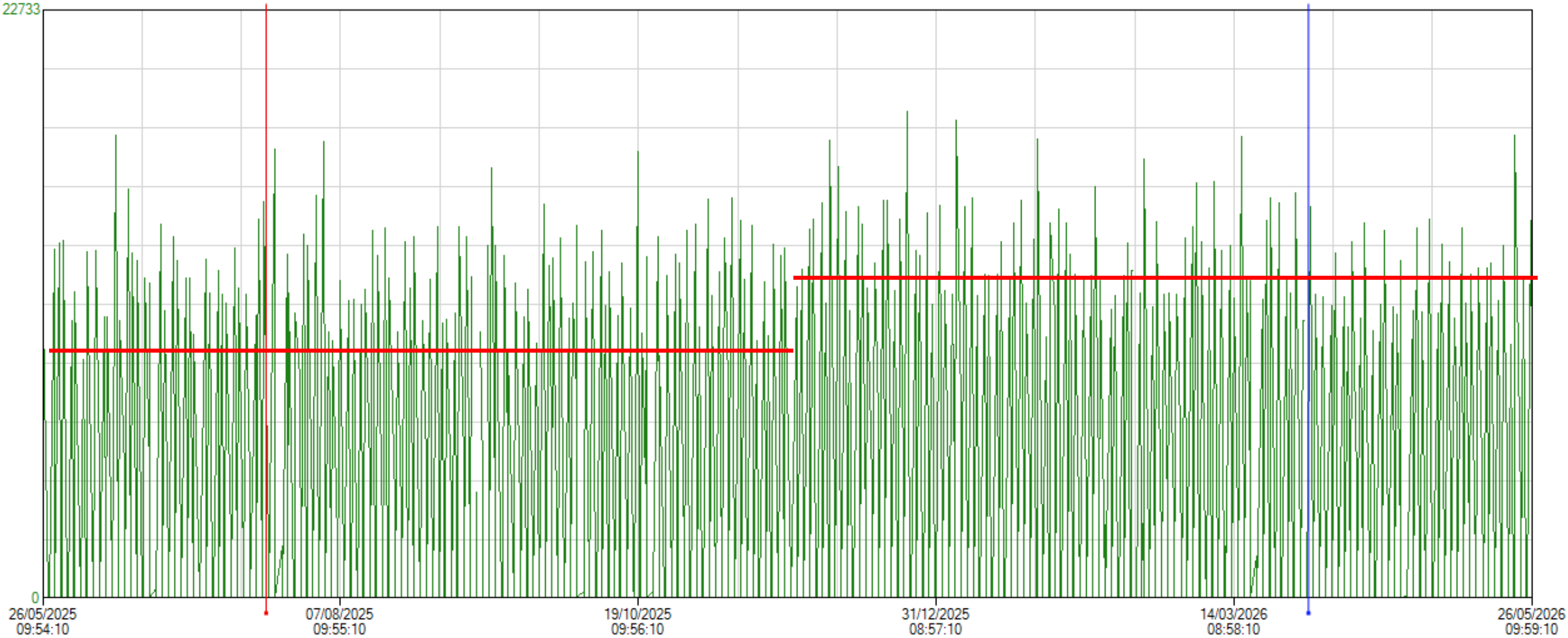
Terminal 1/3

Project Scope is to replace x11 direct online hydrant pumps with x11 VSD pumps and solve the demand switch to T2 issue...

Demand decline on Terminal 1/3



Demand increase on Terminal 2



Demand increase on Terminal 2

Site Overview

Tank Overview

T1/T3 Pumps

T2 Pumps

T2 Hydrant

System

Trends

Engineering

Help

Saved Images

User Group: Default SCADA\GRP-SCADA-MANAGERS

User Name: scada1t hayes

Access Level: 9100

LogOn LogOff

Pipeline

T7748

T7749

T7750

T7751

T7752

T8058

T8497

T1/T3 Hydrant

OS71

OS72

Interceptor/PRT

Bridger

Inventory

ESD

ESD(Override)

ESD Action

Save or Print

26/05/2026 09:57:45

ID:T2Pumps

T2 Pumps

	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5
Flow (l/min)	2867.5	2967.9	3257.4	2967.9	2850.2
Temperature (DegC)	15.9	29.5	15.6	15.2	15.8
Hours Run	5,455	517	5,051	2,761	602
Filter Hours Run	5,455	2,333	3,966	810	1,568
Skipped:Not In Auto	NO	NO	NO	NO	NO
Skipped:Failed To Start	NO	NO	NO	NO	NO
Skipped:Unexpected Stop	NO	NO	NO	NO	NO
Skipped:On Cool Down	NO	NO	NO	NO	NO
Programmed In Sequence But Not Available	NO	NO	NO	NO	NO

TCS Mode ON OFF

Before Enabling Hydrant Pumps:
1. Close Outlet Valve Of Any Tank With Lo Lo Level
2. Ensure There Is A Tank In Service

Pump Sequence

Change Sequence

Setpoints

T2 Hydrant Pumps In Hydrant Mode

T2_Pump1

RUNNING

1st

T2_Pump2

RUNNING

5th

T2_Pump3

RUNNING

2nd

T2_Pump4

RUNNING

3rd

T2_Pump5

RUNNING

4th

TCS Control TCS Reports

Total Flow Today: 882.8 m3

Total Flow Yesterday: 2343.9 m3

T2_LEAK_A Leak Detection

T2_LEAK_B Leak Detection

T2 Manifold Pressure T2_MFOLD_PRESS

T2 Zone 9 Pressure T2_ZONE9_PRESS

T2 Hydrant Combined Flow T2_HYD_COMBINED_FLO

T2 Zone 1 Pressure T2_ZONE1_PRESS

T2 Hydrant Feeder A

T2 Hydrant Feeder B

Events	History	Alarms	Area Hierarchy	Severity	State	Area	Tag_Attribute	Equipment Description	Alarm Condition	TimeLCT	AlarmDuration	Operator
24 Hours	24 Hours	24 Hours	Site	1	ACK	Tankage	T7750.LevelChangeAlarm	Std ACK - ok	Level Changed	12-05-2026 13:18	000 00:00:00.000	d newman
1 Month	1 Month	1 Month	Site	1	ACK	Tankage	T7752_RM_DATA.LevelStatus	Std ACK - ok	Failed	12-05-2026 13:18	000 00:00:00.000	d newman
User Query		Shelved	Site	1	ACK	Tankage	T7750_RM_DATA.LevelStatus	Std ACK - ok	Failed	12-05-2026 13:18	000 00:00:00.000	d newman

Displaying 1 to 4 of 76 alarms Query: Default Filter: NoSeverityZero 100% Complete Dublin, Edinburgh, Lisbon, London

Siren On And Not Muted

Alarm Sounder ON Alarm Sounder OFF

Silence Alarms Reset Mute

Alarm Sounder : Severity 1 or 2 Only

Demand decline on Terminal 1/3

Site Overview

Tank Overview

T1/T3 Pumps

T2 Pumps

T2 Hydrant

OS71 OS72

Interceptor/PRT

Bridger

Inventory

ESD

ESD(Override)

ESD Action

System

Trends

Engineering

Help

Saved Images

Save or Print

26/05/2026 09:58:16

User Group: Default SCADA/GRP-SCADA-MANAGERS

User Name: scada1t hayes

Access Level: 9100

LogOn LogOff

ID:T1Pumps

	Pump 1	Pump 2	Pump 3	Pump 4	Pump 5	Pump 6
Flow (l/min)	0	464	0	0	0	0
Temperature (Deg C)	-50.0	19.8	22.4	24.8	-50.0	27.6
Hours Run	4,121	3,842	3,748	3,138	398	2,866
Filter Hours Run	2,228	3,842	3,748	3,138	398	2,866
Skipped:Not In Auto	YES	NO	NO	NO	YES	NO
Skipped:Failed To Start	NO	NO	NO	NO	NO	NO
Skipped:Unexpected Stop	NO	NO	NO	NO	NO	NO
Skipped:On Cool Down	NO	NO	NO	NO	NO	NO
Programmed In Sequence But Not Available	NO	NO	NO	NO	NO	NO

T1/T3 Hydrant Flow LPS2(High Range)

22733.0

0.0

l/min

Enabled

30 25 20 15 10 5 min

T1/T3 Hydrant Flow LPS1(Low Range)

Use Low Flow Range

9092.0

463.6

l/min

Enabled

30 25 20 15 10 5 min

T1 Hydrant Pressure - C Pier

LPS5

300.0

0.0

Psi

Disabled

30 25 20 15 10 5 min

T1 Hydrant Pumps In Hydrant Mode

Change Sequence

T1_Pump1: OUT O/S Skipped

T1_Pump2: RUNNING (1st)

T1_Pump3: STOPPED (2nd)

T1_Pump4: STOPPED (3rd)

T1_Pump5: OUT O/S Skipped

T1_Pump6: STOPPED (4th)

TCS Mode ON TCS Mode OFF

Before Enabling Hydrant Pumps:
1. Close Outlet Valve Of Any Tank With Lo Lo Level
2. Ensure There Is A Tank In Service

TCS Control TCS Reports

WAP_LEAK CAPIER_LEAK

Leak Detection Leak Detection

Total Flow Today: 265.4 l/min

Total Flow Yesterday: 658.3 l/min

No Pump Start Required

Pressure Not Low

T1 Hydrant Pressure - WAP

LPS6

300.0

151.5

Psi

Enabled

30 25 20 15 10 5 min

Events	History	Alarms	Area Hierarchy	Severity	State	Area	Tag.Attribute	Equipment Description	Alarm Condition	TimeLCT	AlarmDuration	Operator
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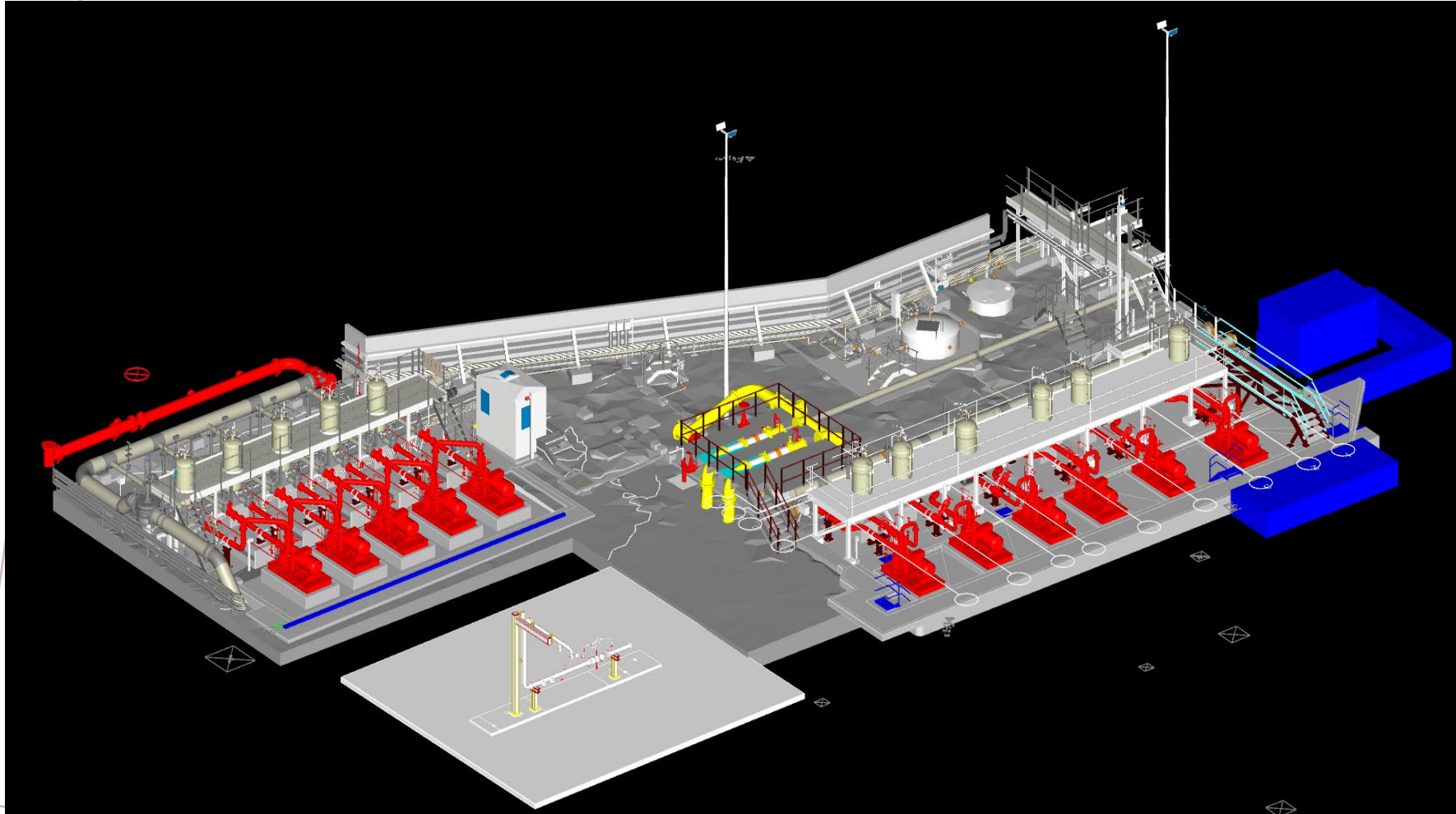
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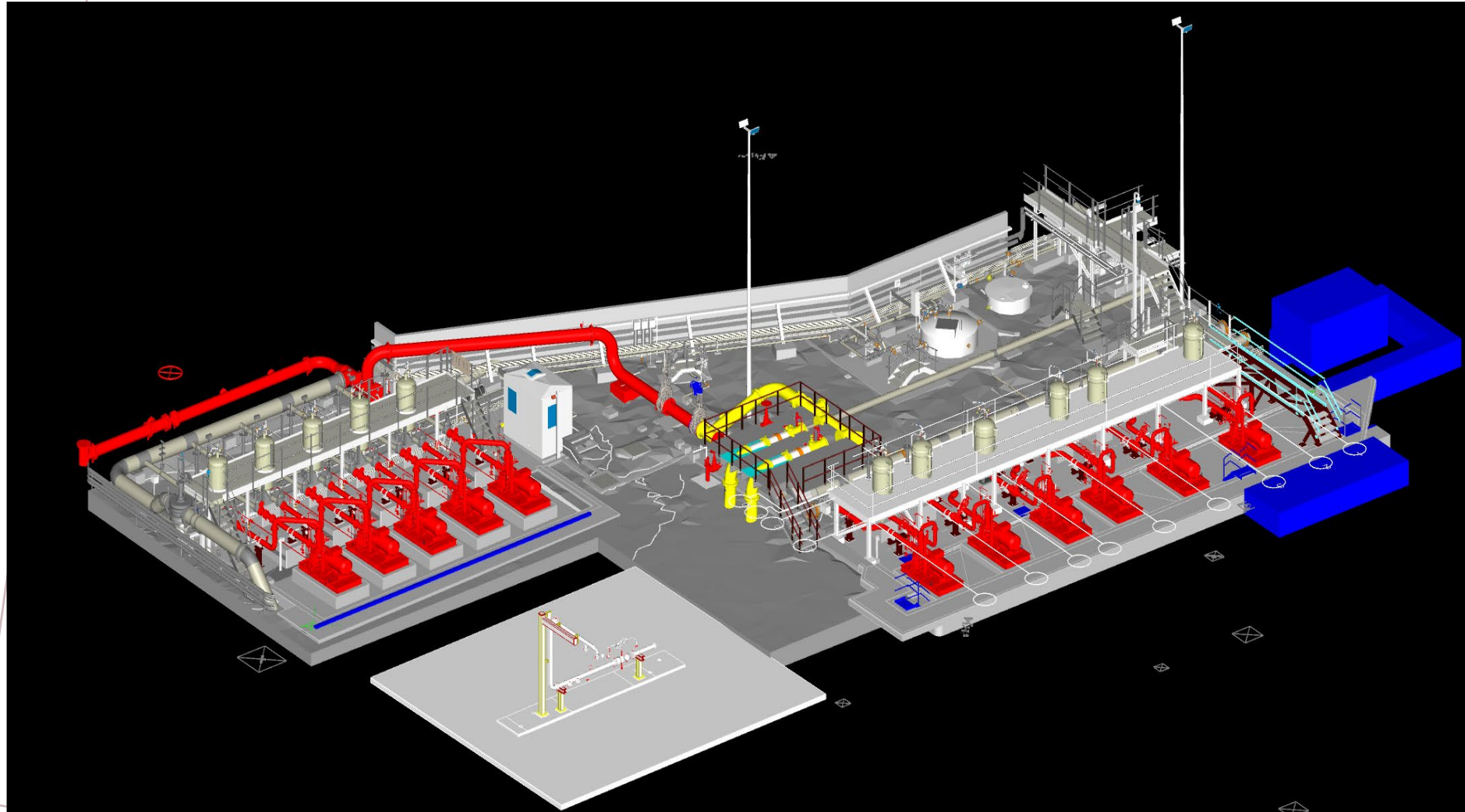


Current configuration of hydrant delivery pumps:

Terminal 1/3 – Combined Hydrant system consisting of x6 hydrant delivery pumps – Max flowrate 22,000 litres / minute

Terminal 2 – x5 hydrant delivery pumps – max flowrate 16,000 litres / minute

Installation of Crossover Pipework



Solution:

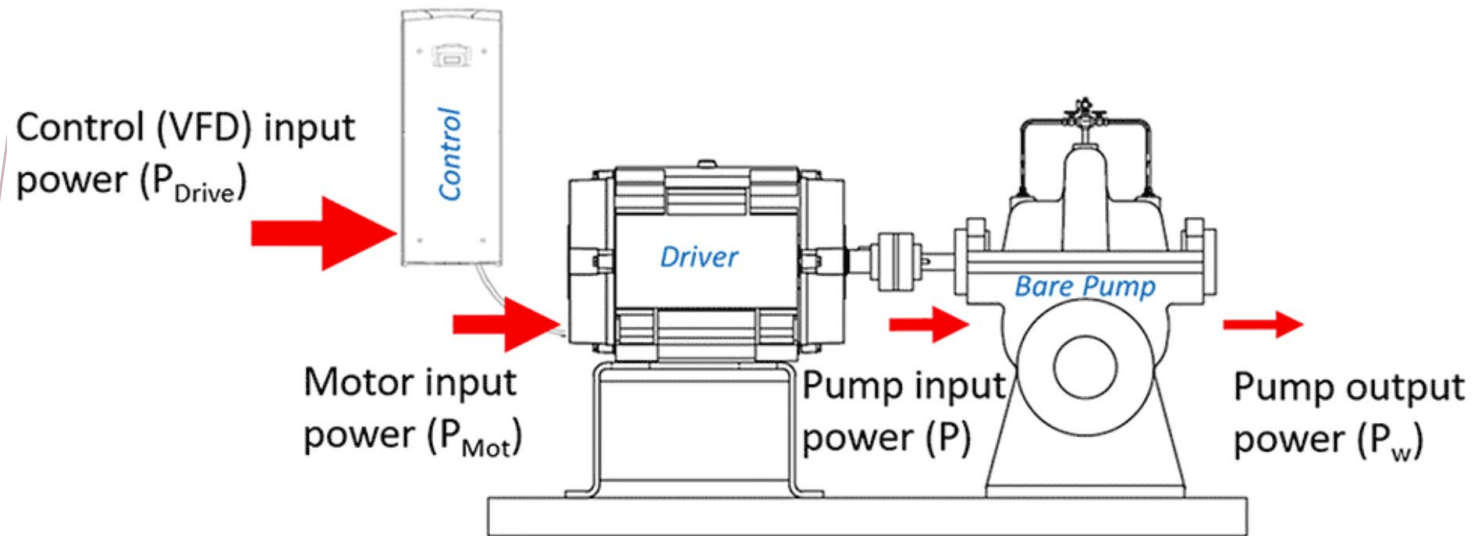
Install “Crossover” feeder line to link the two hydrant systems together

This will create an x11 pump system capable of meeting the demand anywhere on the airfield.

This is a significant operational change!

Why move to Variable Speed Drives (VSDs)

A variable speed drive (VSD) pump is an intelligent pumping system that automatically adjusts its motor speed to match real-time system demands. By controlling the motor's speed and frequency, it delivers precise pressure and flow, drastically reduces electricity consumption, and minimizes wear-and-tear on the pump components.



How It Works

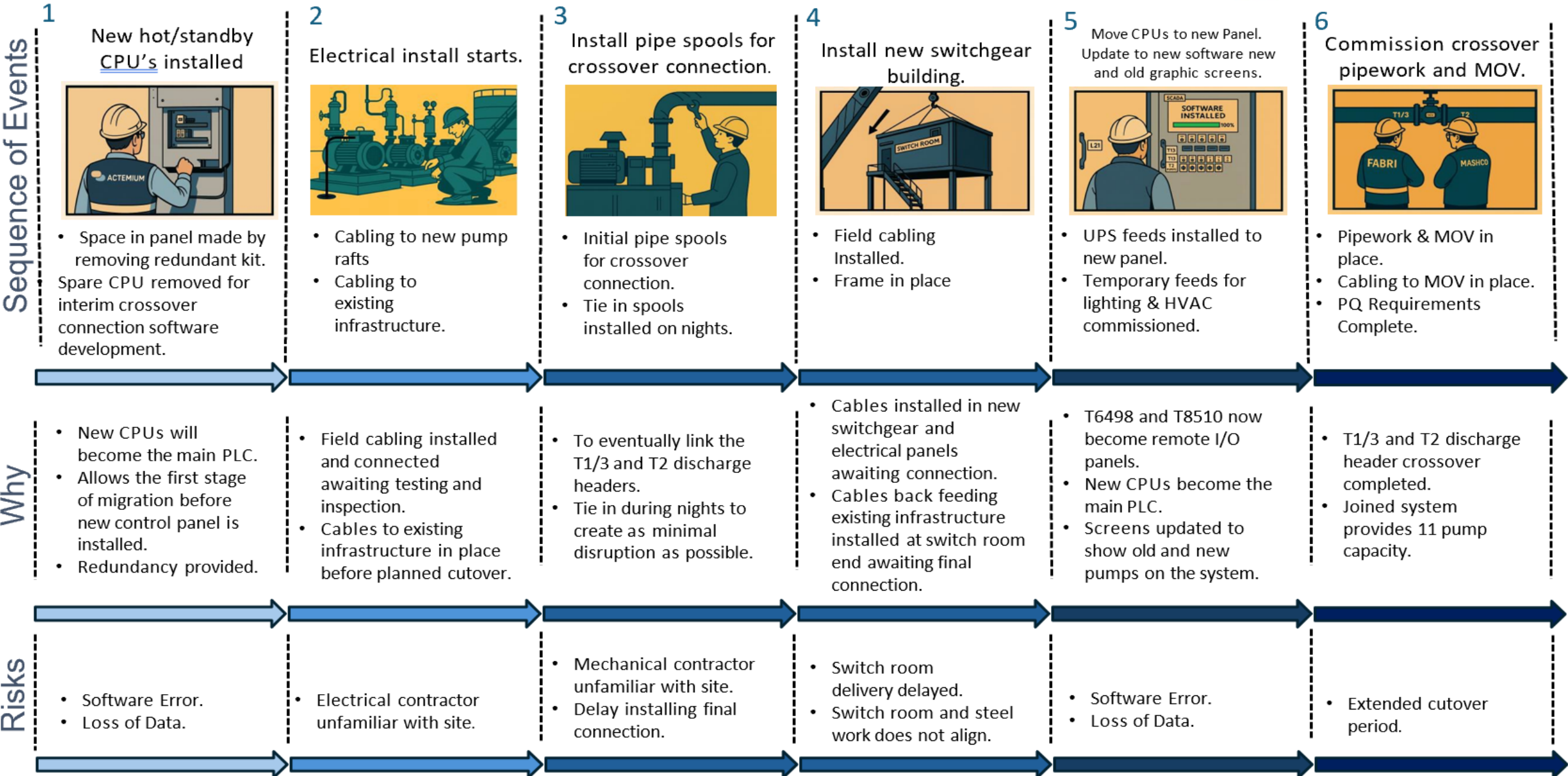
Instead of constantly running at full capacity and relying on mechanical valves to restrict flow, a VSD system constantly monitors demand using pressure and flow sensors.

Dynamic Adjustment: When system demand is low, the VSD lowers the motor's RPM. When demand increases, it ramps up the speed.

Energy Savings: Because motor power consumption drops quadratically as speed is reduced, even a slight decrease in pump speed results in massive energy savings.

Soft Starting: VSDs eliminate the high power spikes (inrush current) that occur when traditional motors start up.

STORY BOARD

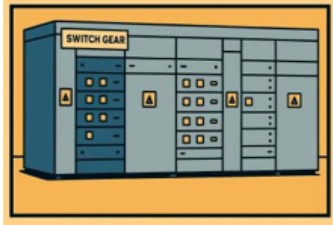


STORY BOARD

Sequence of Events

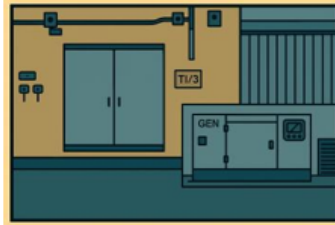
7

Start connecting cabling to new building.



8.1

Duty stand by generator onto T1/3 switch room.



- Works completed on nightshift.

8.2

New cabling to T1/3 transformer & T1/3 back feed cables.



- Cabling connected during dayshift.

8.3

Remove temporary generator, from T1/3 switch room



- Works completed on nightshift.

8.4

Duty Standby Generator to moved to Terminal 2



- Works completed on nightshift.

8.5

New cabling to T2 transformer & back feed cables



- Cabling connected during dayshift.

Why

- Final connections in switchgear and electrical panels allow testing and inspections to begin.
- Back feeder cables connected in switch room pre cutover.

- The supply from the T1 transformer will be rerouted to the new switch room.
- The generators will temporarily supply the T1/3 MCC infrastructure.

- Supplies to back feed T1/3 MCC installed at switch room end awaiting final connection.
- Supply from T1 transformer connected to new switchgear.

- T1/3 MCC now fed from new switchgear.
- Generators are moved to begin the MCC cutover.

- The supply from the T2 transformer will be rerouted to the new switch room.
- The generators will temporarily supply the T2 MCC infrastructure.

- Supplies to back feed T2 MCC installed at switch room end awaiting final connection.
- Supply from T2 transformer connected to new switchgear.

Risks

- Delays in installation.

- Extended cutover period.
- Impact on airport operations.

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- Impact on airport operations.

- Switchgear failure leading to loss of T1/3 MCC.
- Impact on airport operations.

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- Extended cutover period.
- Impact on airport operations.

STORY BOARD

Sequence of Events

8.6

Remove temporary generator, from T1/3 switch room



- To be done on nights

9

Pre commissioning checks / tests.



- Electrical handover pack checked.
- Electrical install to new assets complete, power on to new equipment.

10

Pump cutover and commissioning period.



- Pumps cutover one at a time.
- Pumps will continue to run at Direct Online

11

Test variable speed control.



- Works completed on nightshift.
- Utilising the test rig to return product to tank.

12

Commission new flow meters.



- Verifying flow reading against known parameters.

13

Test variable speed control on the live hydrant.



- Revert plan in place.

Why

- T2 MCC now fed from new switchgear.
- Transformer and MCC cutover period completed.

- Verifies the electrical and mechanical installations are correct.
- Helps identify issues.
- Ensures safe conditions before full energisation and flooding of the system.

- Maintains existing pump capacity.
- Pumps run at 100% as still controlled via existing logic.

- Allows time to tweak the system before going live on hydrant.
- Less impact to the airport during nightshift.

- Verifying flow reading against known parameters.
- Ensure confidence in the new monitoring system configuration.

- Validate configuration under real operating conditions.

Risks

- Switchgear failure leading to loss of T2 MCC.
- Impact on airport operations.

- Working on live systems.
- Isolation procedures not followed.

- Loss of containment.
- Extended outage.

- Control system operating incorrectly.
- Simulated system.
- Extended commissioning.

- Instrument functionality incorrect.

- Impact on airport operations.



Managing the Change - MoC



Management of Change - MoC

Change Management Process



It is essential to manage any changes through the Management of Change Process – MoC

It is important to define roles at the implementation stage. For example, who is the change owner and who will ultimately approve the change.

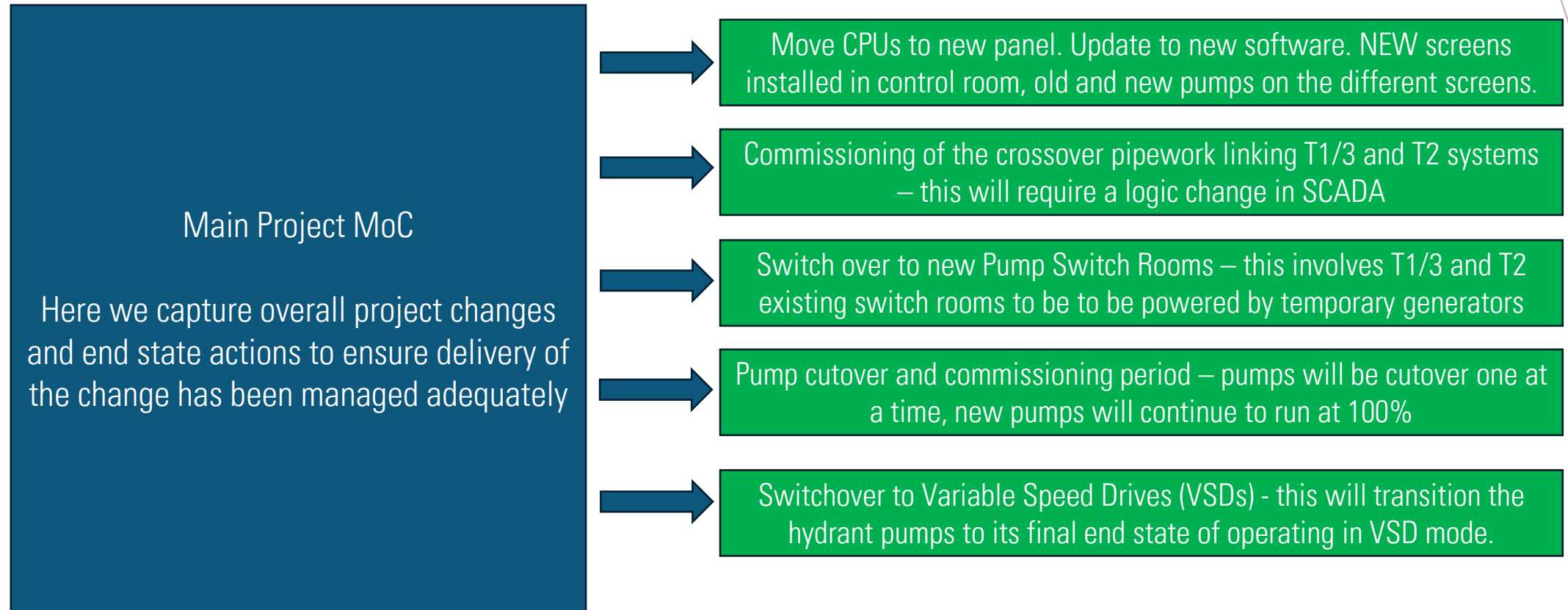
Carry Out a Risk Assessment to determine the level of risk the change will carry. In the case of Hydrant pump replacement this is high risk for a number of reasons.

Ensure actions are determined by committee and assigned and communicated for close out progress.

Review of actions status before moving to implementation into Operations

Management of Change - MoC

Change Management Process



Management of Change

MoC Structure – Delegation of Responsibility

