

# Digital Strategy & AI for Project Management


Jaydev Chauhan & Kent Paul Joseph

ONTARIO **POWER**  
GENERATION

Where a brighter  
tomorrow begins.



# Table of Contents

- 
- A decorative graphic element consisting of a green arrow pointing right, which is part of a larger green shape that resembles a stylized 'Y' or a bracket, pointing towards the list of contents.
- 1. Reality Capture – Project sites
  - 2. Digitization
  - 3. Artificial Intelligence

# Reality Capture

- Access to the project site from your office computer
- Way to capture the shape of physical environment into the computer world as a digital 3D representation
- The Innovative 3D Strategy Initiative have added a significant value to OPG



# Benefits to Project

## Increased:

- **Access to project area – Virtual 24/7**
- **Safety** - Reduction in unexpected conditions
- **Accuracy of measurement extraction**
- **Project efficiency – planning and scheduling**
- Personnel training opportunities

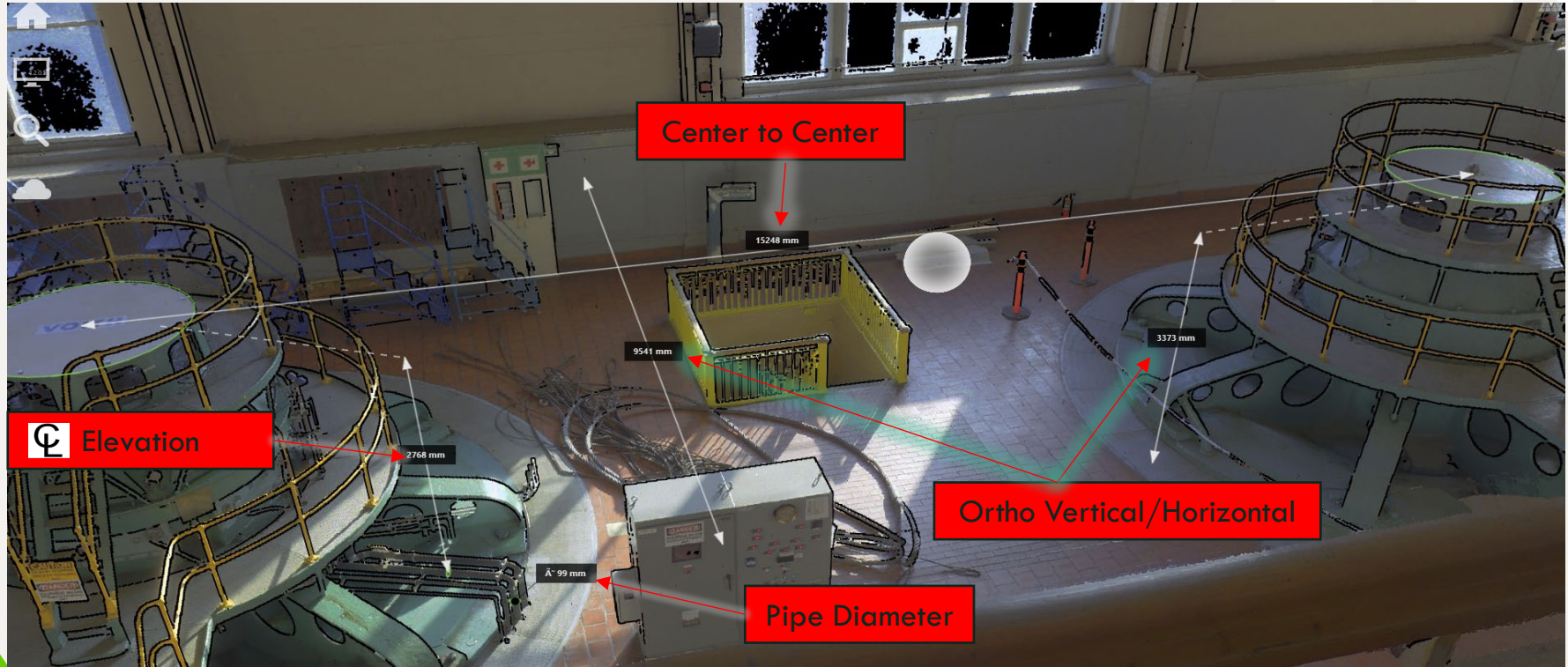
## Reduced:

- **Radiation Dose**
- **Travel Times**
- **Field walkdowns**
- **Project costs - rework**
- **Construction hours**



# Improve Project Planning w/ As-Built Conditions

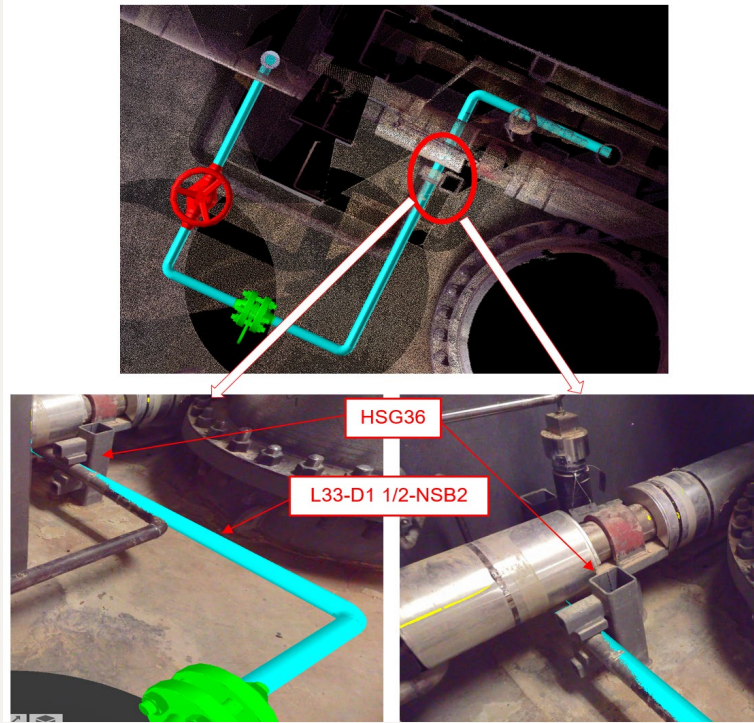
## Accurate Measurement Extraction



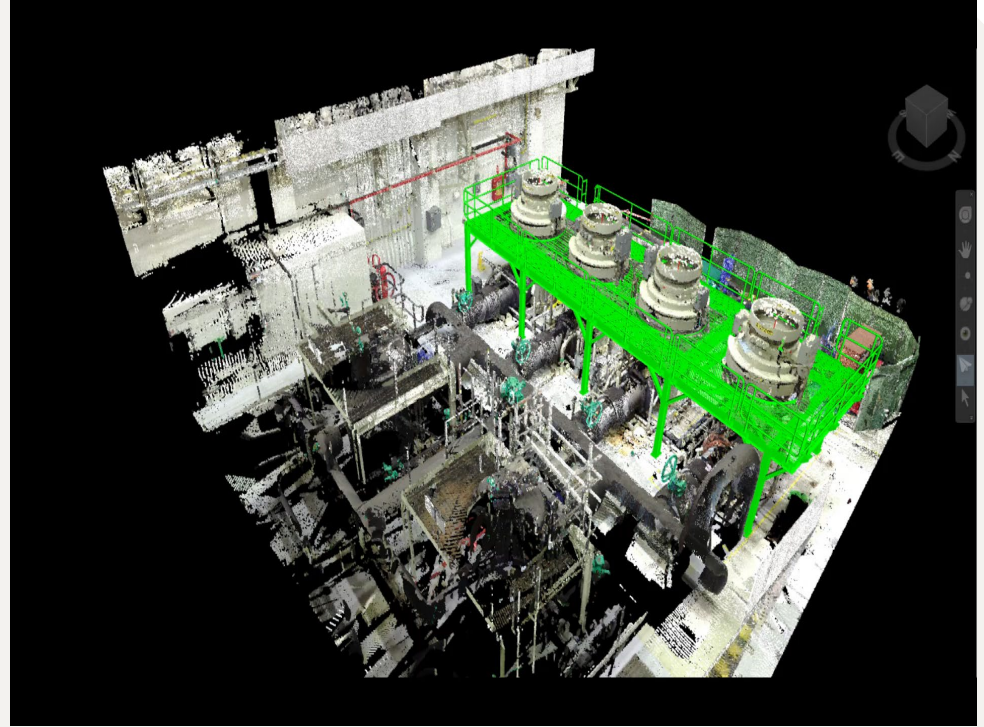
RG Sir Adam Beck 1 – Turbine Floor

# Interference Detection during Project Planning

## As built vs As-Design Interference Detection



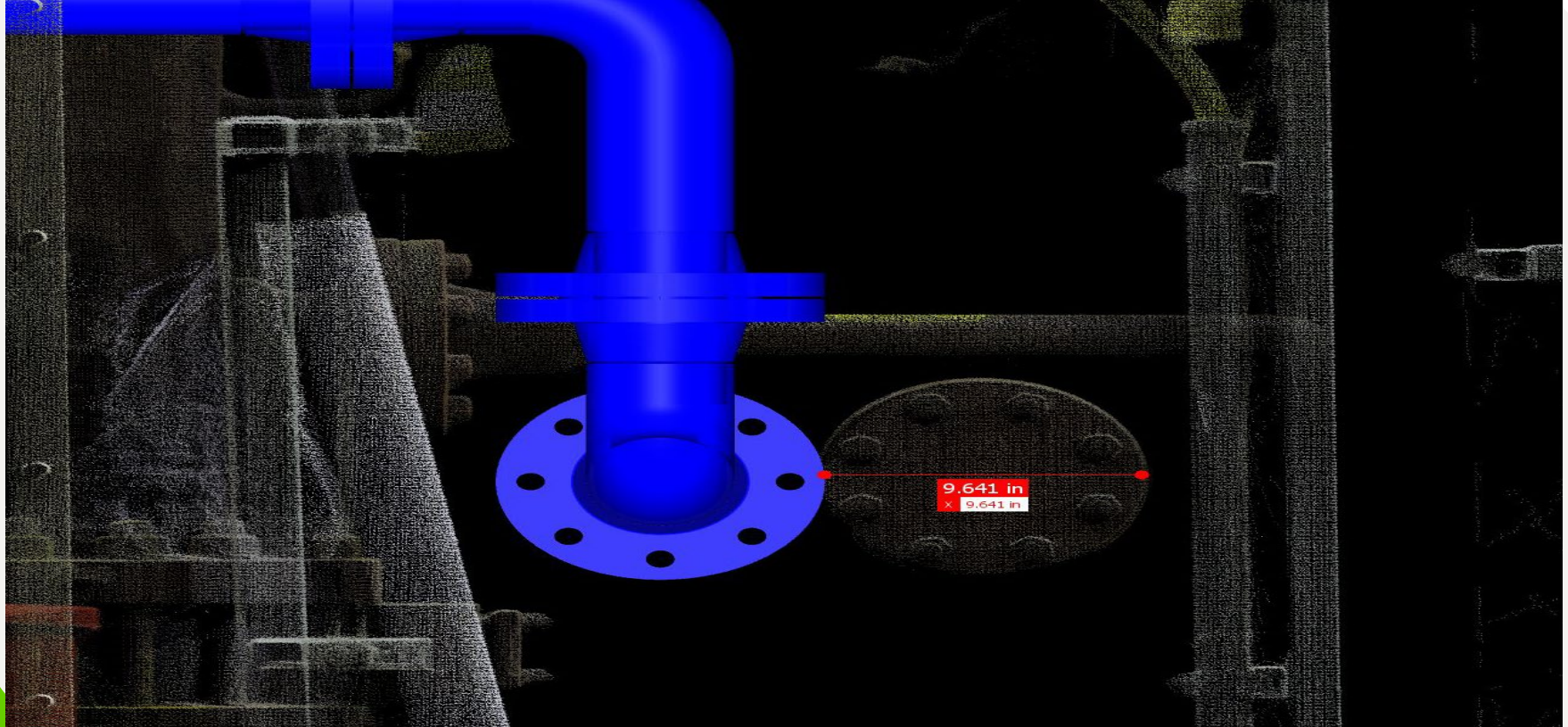
DNGS Vault – Flange Installation



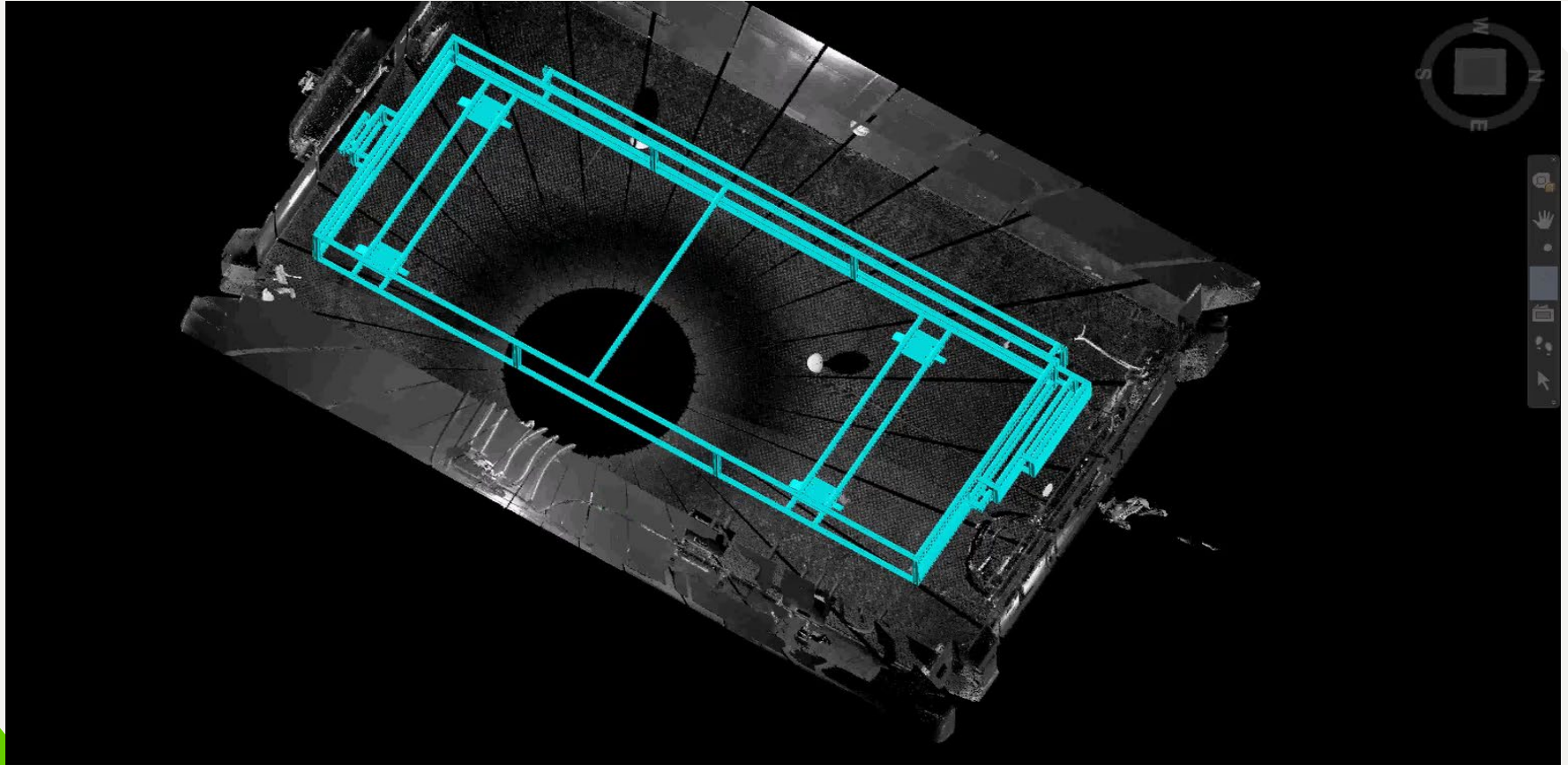
DNGS ESW Pumpouse – Platform Installation



# Alignment Verification During Design



# Constructability – Fit Verification

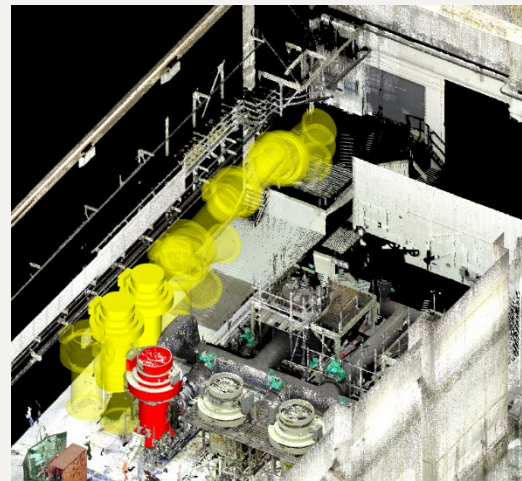




# Constructability Test During Planning

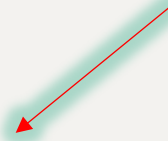
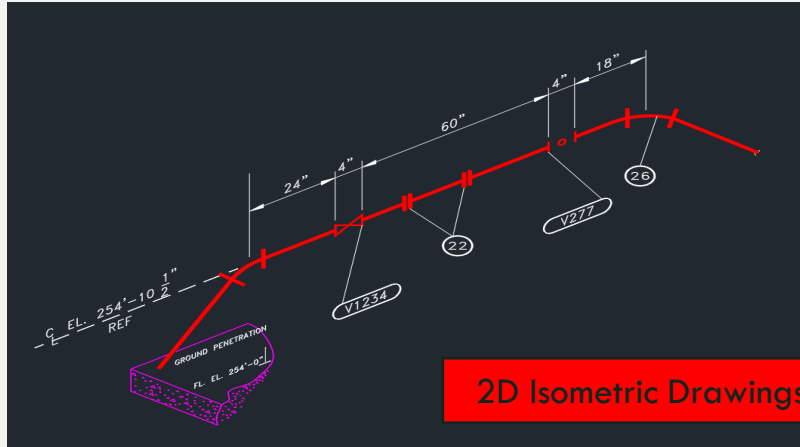
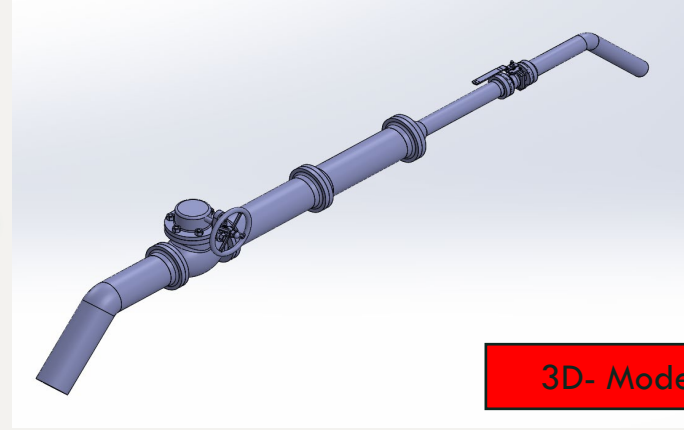


Spacing Layout



Rigging Paths

# As-built 3D Modelling and Drawings

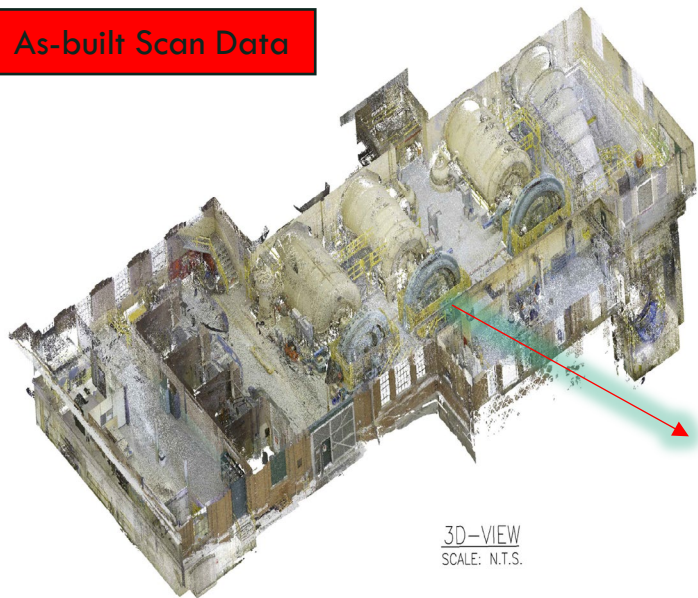


# General Arrangement Drawings

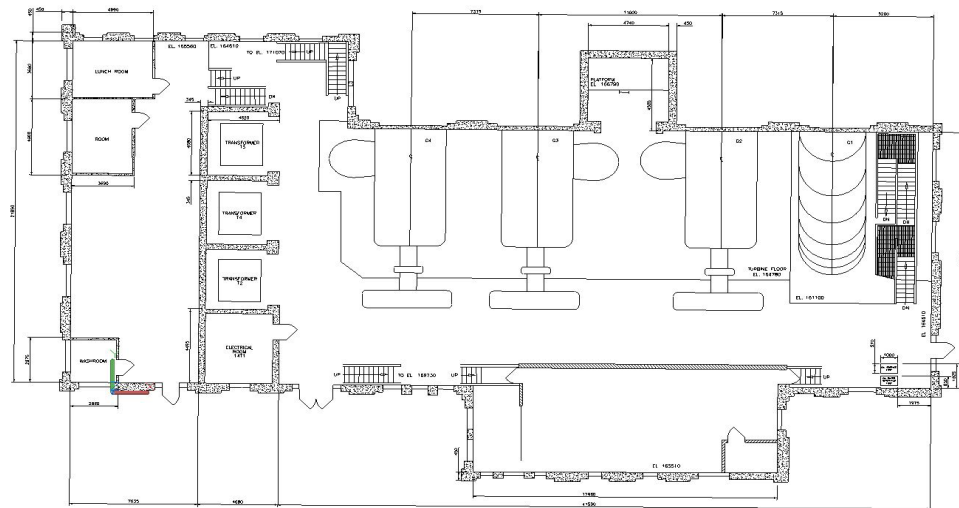
Get As-built Data

2D Plan Drawings

As-built Scan Data



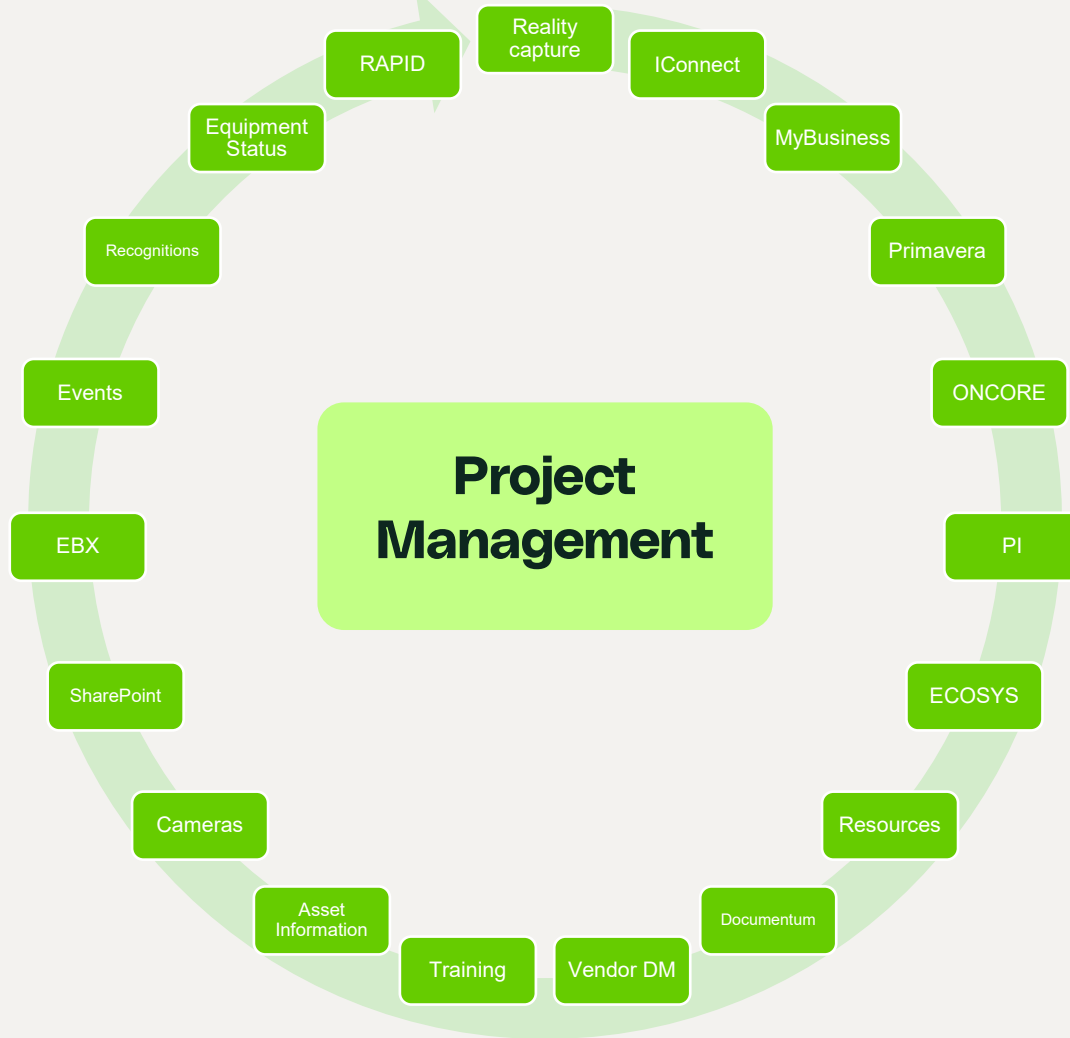
3D-VIEW  
SCALE: N.T.S.



PLAN AT EXISTING TURBINE FLOOR EL.164780  
SCALE: N.T.S.



# Digital Systems



# Digitization efforts

- Reporting
- Space Allocation
- Digital Contract Model
- Free Address Reservation
- Safety Announcements

# Reporting

## Unit 4

My Business Units ▾

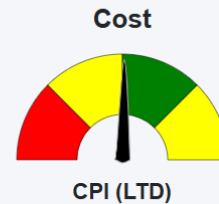
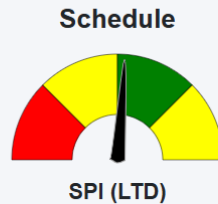
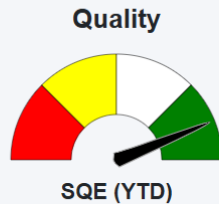
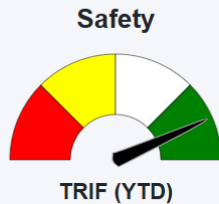
My Projects ▾

My Reports ▾

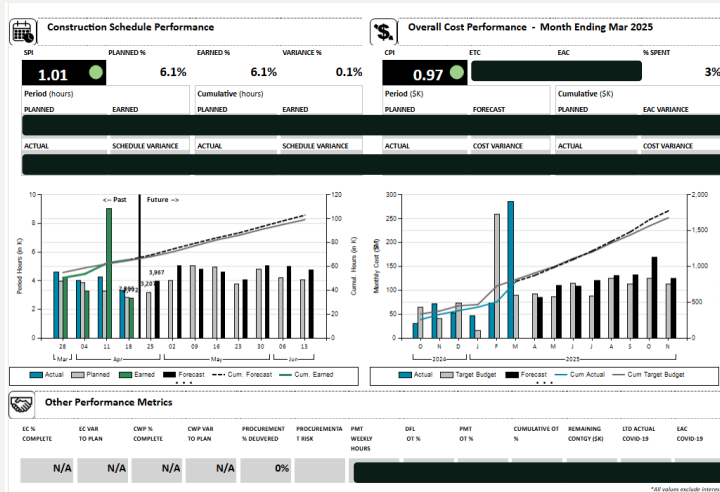
## Report Directory

Paul Joseph, Kent

Report Search ...



The Unit 4 Fuel Channel Install Series series began on **Sunday, January 12, 2025**

[illegible]

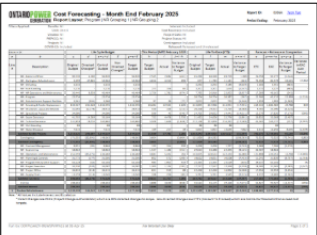


# Cost Reporting

Program      **Cost**      Risk      Schedule      Finance      Engineering      Work Management      Procurement      Other

## Cost

0306A - Cost Forecasting



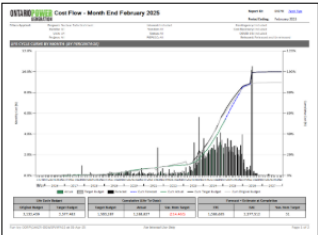
Provides financial performance for each program by bundle. Reports on cost performance for life cycle, current month and life to date.

0307A - Cost Curves and Graphs



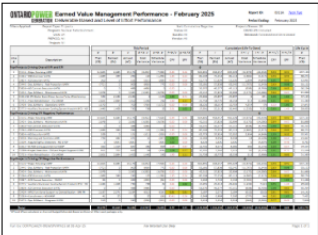
Set of 5 cost curves [Total, EV, Non-EV, Thru U2, Lifecycle] and graphs.

0307B - Cost Curves and Graphs by Percentage



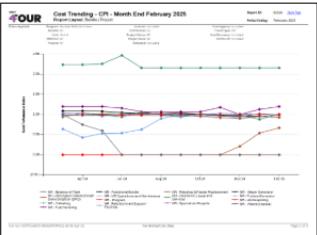
Life cycle cost curves by percentage.

0311A - Earned Value Performance



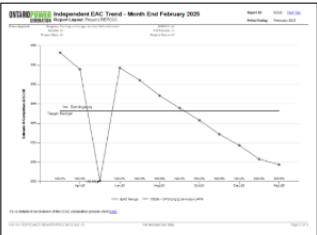
Earned Value (Deliverable Based) Report

0316A - Cost Trending



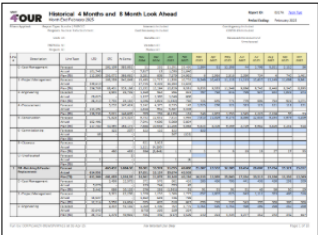
Cost Trending Report with the Ability to trend on FAC

0316C - Independent EAC Trend



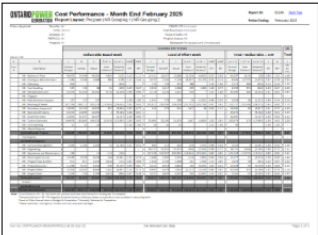
Independent EAC Trend

0317A - Cost - 4 and 8 Month View



Cost trending report showing historical and future

0319A - Cost Performance



Cost Line items grouped by PIFCCC

# Schedule reporting

Program

Cost

Risk

**Schedule**

Finance

Engineering

Work Management

Procurement

Other

## 0233A - Weekly Performance Review Metrics Summary

Provides a detailed weekly summary of the performance against the baseline schedule and current forecast schedule.

## 0234A - Segment Overview By Window

Provides an overview of the status of Execution Windows for the selected Segment from the current schedule

## 0234E - Window Progress Reports

Provides an overview of execution window progress as well as various L3 Activity performance metrics.  
Provides Windows Progress, IMF Health, and IMF Float reports.

## 0234F - Window Progress Reports V2

Provides an overview of execution window progress as well as various L3 Activity performance metrics.  
Provides Windows Progress, IMF Health (with enhanced Vendor metrics), and IMF Float reports.

## 0234H - IMF Impact

IMF Impact

## 0235F - Project and Activity Update Issues

Identifies the projects that do not have a recently updated data date and activities that are riding the data

## 0236A - Activity History Details

Activity History Details

## 0238A - T+1 Activity Details

This report identifies activities that were in the T-0 plan for a specific week and whether or not they were

# Digital Contract Model

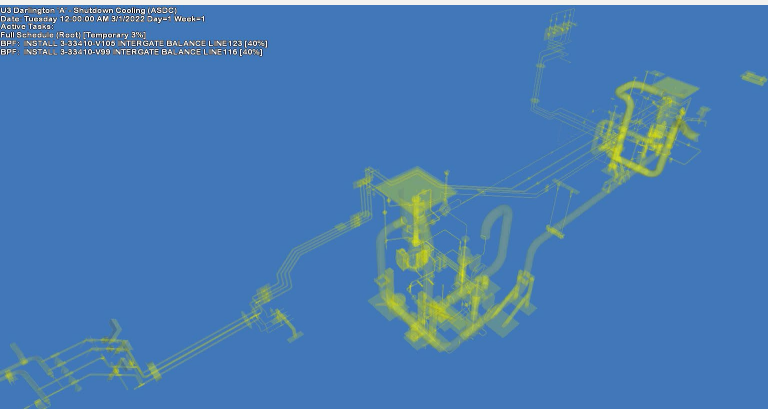
- In production for Pickering Refurbishment
- Generates contract model curves for possible scenarios of each phase/unit
- Enables to see both cost and schedule impacts for the project / bundle

Phase/ Unit	Phase/ Unit	Phase/ Unit	Phase/ Unit	Phase/ Unit
Def	U5	U6	U7	U8
Cost Perf Input	Cost Perf Input	Cost Perf Input	Cost Perf Input	Cost Perf Input
0.00%	2.00%	-5.00%	-4.00%	-6.00%
Schedule Perf_Days	Schedule Perf_Days	Schedule Perf_Days	Schedule Perf_Days	Schedule Perf_Days
0.00	-7	-13	6	-30
Def Target Cost	U5 Target Cost	U6 Target Cost	U7 Target Cost	U8 Target Cost
Def Cost to Project	U5 Cost to Project	U6 Cost to Project	U7 Cost to Project	U8 Cost to Project
Combined Cost to Project		Combined CanAtom Takeout		Boiler & OSM
		Combined Inc/DisInc		Total Cost Including Boiler

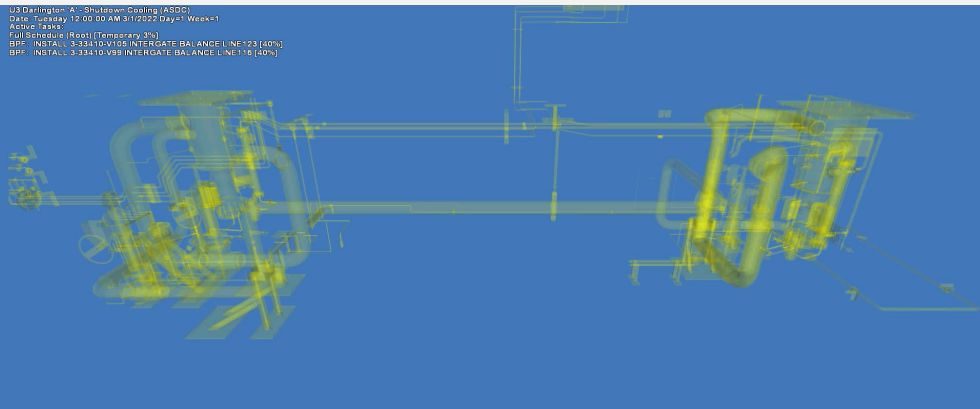


# Project Planning 4D schedules

U3 Darlington A - Shutdown Cooling (ASDC)  
Date: Tuesday, 12/06/00 AM 3:10:22 Day=1 Week=1  
Active Tasks:  
Cooling Water (Root) Temporary 3%  
BPH: INSTALL 3-33410-V105 INTERGATE BALANCE LINE 123 (40%)  
BPP: INSTALL 3-33410-V89 INTERGATE BALANCE LINE 116 (40%)

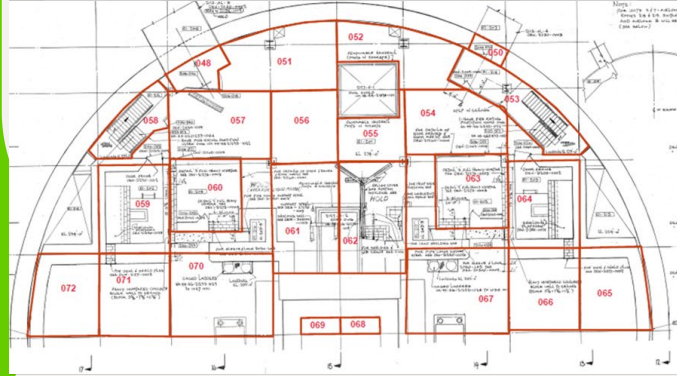


U3 Darlington A - Shutdown Cooling (ASDC)  
Date: Tuesday, 12/06/00 AM 3:10:22 Day=1 Week=1  
Active Tasks:  
Cooling Water (Root) Temporary 3%  
BPH: INSTALL 3-33410-V105 INTERGATE BALANCE LINE 123 (40%)  
BPP: INSTALL 3-33410-V89 INTERGATE BALANCE LINE 116 (40%)



# Project Space Optimization

- Reduce space and schedule conflicts on in-field work.
- Visualization of work taking place in the station.
- View of potential work real-estate conflicts showing:
  - Work Order
  - Location



No. of Projects in the Area		No. of Activities in the Area	
8		754	
Potential Conflicts:			
Conflicting Project Name	Conflicting Activity Name	Activity_ID	Project Owner
73753 - U4 - Valve Rehabilitation	(J) MM PRE-STAGE ACTUATOR & TOOLING	0631823504	Downey, Joseph
73753 - U4 - Valve Rehabilitation	(J) MM SWAP THE ACTUATOR	0631823509	Downey, Joseph
73753 - U4 - Valve Rehabilitation	(CRTD) PERFORM LEVEL 2, ITP PB VERIFICATION INSPECTION	0577384161	Downey, Joseph
73753 - U4 - Valve Rehabilitation	(CY) LAP SEATS / WEDGE	0577383537	Downey, Joseph
73753 - U4 - Valve Rehabilitation	(CY) MACHINE REPLACEMENT JUNK RING	0577383757	Downey, Joseph
73753 - U4 - Valve Rehabilitation	(CY) MACHINE REPLACEMENT JUNK RING	0577384171	Downey, Joseph
73753 - U4 - Valve Rehabilitation	(CY) MACHINE REPLACEMENT JUNK RING	0577384584	Downey, Joseph
73753 - U4 - Valve Rehabilitation	(CY) PERFORM SEAT / WEDGE LAPPING	0577381642	Downey, Joseph
73753 - U4 - Valve Rehabilitation	(CY) PERFORM SEAT / WEDGE LAPPING	0577383732	Downey, Joseph
73753 - U4 - Valve Rehabilitation	(CY) PERFORM SEAT /	0577383939	Downey, Joseph

## Pickering Refurbishment Space Allocation

# Project Space Optimization

- Identify free working stations.
- Check-in and Checkout System using unique QR Codes.
- Better manage office space usage.

## RPO 2nd Floor Status



## Free Address Reservation



# Project site safety Announcements / communications

- Improve Safety Communication.
- Employees can register using a forms to subscribe to get texts of PA Safety Announcements.
- Similar App created to send text to OPG employees on other communication.

## DNGS Station Announcement

Station Emergency	Intruder Alert
Radiation (and Other) Incident	Conventional Emergency Outside Protected Area
ECI Long Term Injection Mode	Alert Emergency Response Personnel (Medical Pull Station)
EFADS Venting	Conventional Emergency inside Protected Area
Unexpected Unit or Station Transient	Evacuation of Containment
Steam or Feedwater Line Break	Breathing Air Incident
Critical Lift	Radiography
Transportation of Hydrazine/Amonia/ Morphaline	MCR Lock Up
Page an Individual	All Clear
Tuesday 2PM	Drill Msg
Add Numbers	Demo

11:18 48%

← D Darlington Station Announceme... ☎ ⋮

Announcement:  
Attention all personnel  
There is a fire alarm In unit: 1 elev: 122 m  
Room: T1-406  
ERT members please respond  
Other personnel avoid the incident area and continue normal duties  
Do NOT use elevators

Announcement:  
Attention all personnel  
The fire alarm in unit 1, T1-406 was determined to be false by Darlington ERT.

Tuesday, Feb 25 • 9:14 AM

Attention all personnel. The Darlington station will be conducting a station emergency drill today.  
If you have not been identified as a participant, no action is required.  
Assembly and accounting is NOT required.

Tuesday, Feb 25 • 10:36 AM

THIS IS A DRILL.  
Attention all personnel.  
There is a simulated station emergency on unit 2.  
THIS IS A DRILL.

Wednesday ⬇ 7:42 PM

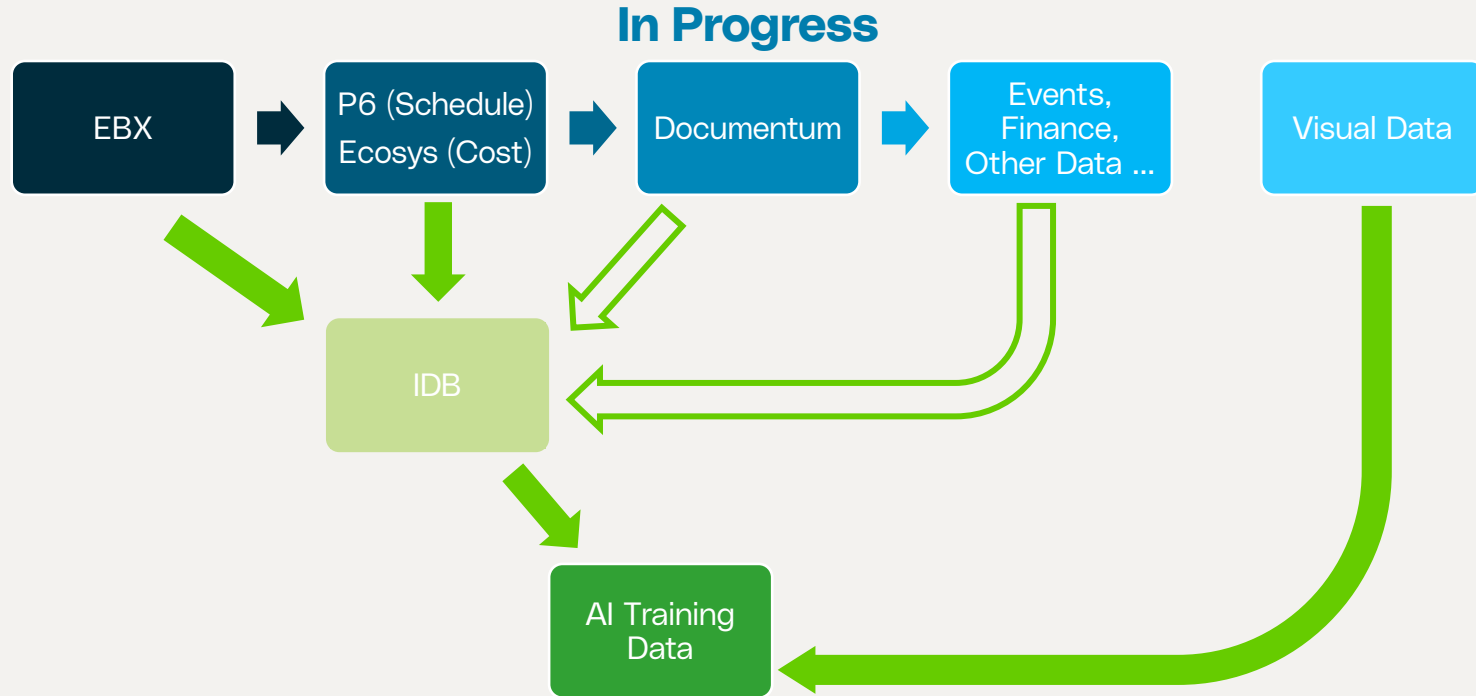
+ Text message 😊 📎 🗣



- Inventory of tools and equipment along with quantities and location.
- Track project tools and equipment.
- Location tracking of item travel path.

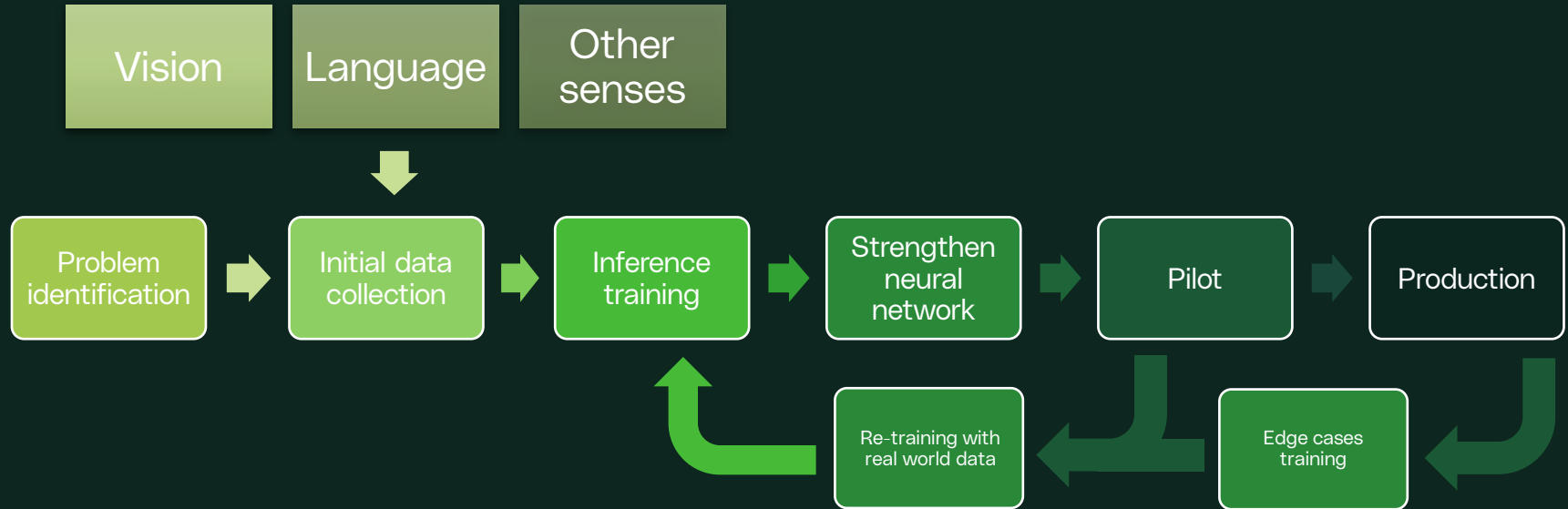
- Inventory of tools and equipment along with quantities and location.
- Track project tools and equipment.
- Location tracking of item travel path.

# Project Data Integration



# Artificial Intelligence

To strive for continuous improvement in construction using artificial intelligence.




# Project Intelligence

- Schedule & cost status
- Create presentations to show project updates (Performance packages, Board Reports, etc.)


Welcome to Project Intelligence


What do you want to know?

Ask me anything...

 Search

 Think







# Project Intelligence

Hello, How are you



I'm doing great, thanks for asking! Just hanging out in the digital realm, ready to answer your questions with a dash of wit and a sprinkle of wisdom. How about you—how's your day going?



What is the schedule performance for the project number 88421 on the period of 2025-04-11 at weekly duration?



For the project number 88421 during the period of 2025-04-11, the schedule performance metrics are as follows:

## This Period (Weekly)

- **Planned Value (PV):** 8071
- **Earned Value (EV):** 7600
- **Schedule Variance (SV):**  $EV - PV = 7600 - 8071 = -471$  (indicating the project is behind schedule)
- **Schedule Performance Index (SPI):**  $EV / PV = 7600 / 8071 = 0.94$  (a value below 1 indicates inefficiency in time usage)

## Cumulative (Life-To-Date)

- **Planned Value (PV):** 94762
- **Earned Value (EV):** 92578
- **Schedule Variance (SV):**  $EV - PV = 92578 - 94762 = -2184$  (indicating the project is behind schedule)
- **Schedule Performance Index (SPI):**  $EV / PV = 92578 / 94762 = 0.98$  (a value below 1 indicates inefficiency in time usage)

## Percent Complete

- **Percent Complete:** 825% (this value seems unusually high and may indicate a reporting error or miscalculation).

In summary, the project is currently behind schedule both for the weekly period and cumulatively. The SPI values indicate that the project is not utilizing time efficiently.

Ask follow-up



## Query Assistant

Ask me any question

what are the issues observed on project 83039

Generate Answer

The project number 83039 has several issues that have been observed and documented. Here are the key issues:

- Risk 16540 Realized - Vendor Design Cost and Schedule Overruns:** This issue was identified in 2019, where there were cost increases and schedule impacts due to additional efforts required to meet quality standards. The issue has been closed as a contract amendment was signed on September 27, 2019.
- RDM Project Risk 17460 Realized - DRDS Requirement Challenges:** There were challenges in using the Mk1 Tool umbilical with the Rapid Delivery System (RDS) due to non-compliance with safety standards. This issue has been closed, and a redesign has been initiated.
- Procurement Strategy for Commissioning Spares:** A strategy was required to cover commissioning spares for the initial outage. The issue has been closed as a procurement plan was established.
- Risk 17412 Realized - ANDE System Modifications:** There was a risk that modifications to the ANDE System were not declared AFS prior to fabrication. A recovery plan is in progress, and the issue has been closed.
- Potential Impact to CWEST Liner Design:** There were concerns regarding the CWEST tool head navigation due to material contact. The issue has been resolved, and testing has confirmed that interferences are no longer a problem.
- Material Inspection Tooling Issues:** The ANDE MK2 inspection tooling could not be qualified for inspection due to high levels of chatter. A recovery plan is in place, and the issue has been closed.
- Vendor Resource Availability:** There were delays in the progression of CWEST work due to vendor resource unavailability. This issue has been closed as the vendor has since provided the necessary resources.

## Prompt Gallery

Project Name  
DN TURBINE HALL CRANE CONTROLS UPGRADE

Initiation Planning Execution Control Closure

### Project Proposal

Create a comprehensive proposal outlining the project's goals, scope, deliverables, timeline, budget, and anticipated benefits to align stakeholders and secure approval.

Generate

### Stakeholder Identification

Identify and categorize key stakeholders, detailing their roles, interests, influence, and communication preferences to ensure effective engagement and support.

Generate

### Project Charter

Develop a foundational document that summarizes the project's objectives, scope, key stakeholders, deliverables, milestones, budget, and success criteria to officially kick off the project.

### Completion

To effectively identify and categorize potential stakeholders for the "DN Turbine Hall Crane Controls Upgrade" project, we can utilize a typical stakeholder analysis framework. The following details describe the stakeholders, categorize them, and outline their roles, interests, influence levels, and preferred communication methods.

#### 1. Project Sponsor

- **Role:** Provides funding and overall direction for the project.
- **Interest:** Successful completion of the project on time and within budget.
- **Influence Level:** High
- **Communication Preferences:** Monthly updates, formal reports, and meetings.

#### 2. Project Manager

- **Role:** Oversees the project execution, manages the team and resources.
- **Interest:** Meeting project deadlines and achieving objectives.
- **Influence Level:** High
- **Communication Preferences:** Daily briefings, email updates, and informal meetings with the team.

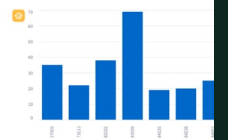
What are the top projects with most risk observed

The top projects with the most observed risks are as follows:

1. Project Number: 83039, Risk Count: 4128
2. Project Number: 83039, Risk Count: 239
3. Project Number: 73115, Risk Count: 202
4. Project Number: 73116, Risk Count: 137
5. Project Number: 73116, Risk Count: 184

These projects have the highest number of risks identified within the system.

Create bar graph of projects with most issues



- Talk to Project Data with natural language and get natural responses
- Generate visualizations with simple text
- Prompt templates to generate documents and reports for project manager

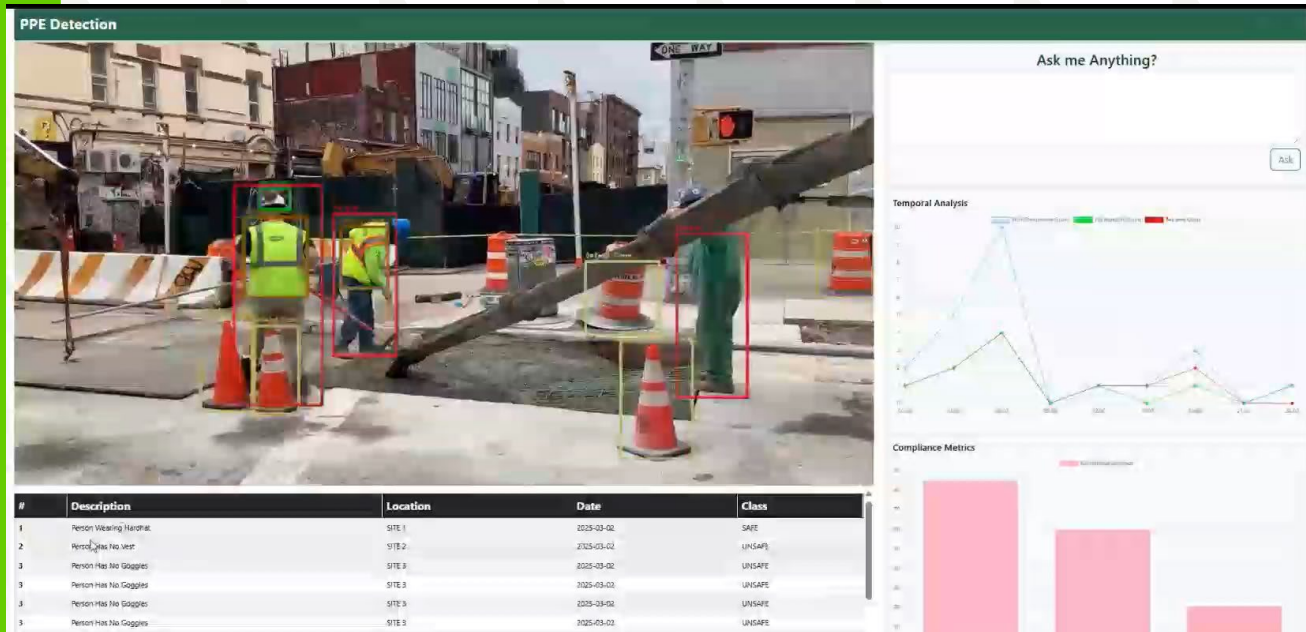
# Combustible Materials and Fire Detection

- Proactively identify how long has the combustible material stayed around a hot work area and trigger a warning to take mitigating actions accordingly.
- Detect active fires, smoke, etc.



# Construction Safety

- Detect Personal Protective Equipment (Hardhats, Vest, Fall Harness, etc.)
- Detect heavy equipment.
- Safety dashboard showing trends and use of PPE.



# Loose Item Control

- Trained to save Electronic Personal Dosimeter.
- Track EPDs during the doffing anti-Cs / plastic suits.
- Provide sound notification when the EPD is not removed to remind the worker.





# Site Parking Space Tracker

- Identify and count parking spots that are free using computer vision and display the number of available spots at the Entrance.
- Improve worker mood and reduce wasted time.



# Questions?

The logo consists of the letters 'OPG' in a bold, dark blue, sans-serif font. A stylized white arrow is integrated into the letter 'P', pointing to the right.

**OPG**

*Electrifying*  
**life**

**OPG**