

OCTOBER 24, 2023

Super Charging Efficiency with AVEVA™ E3D Design

Rishabh Engineering Perspective

Naveen Raj Pal

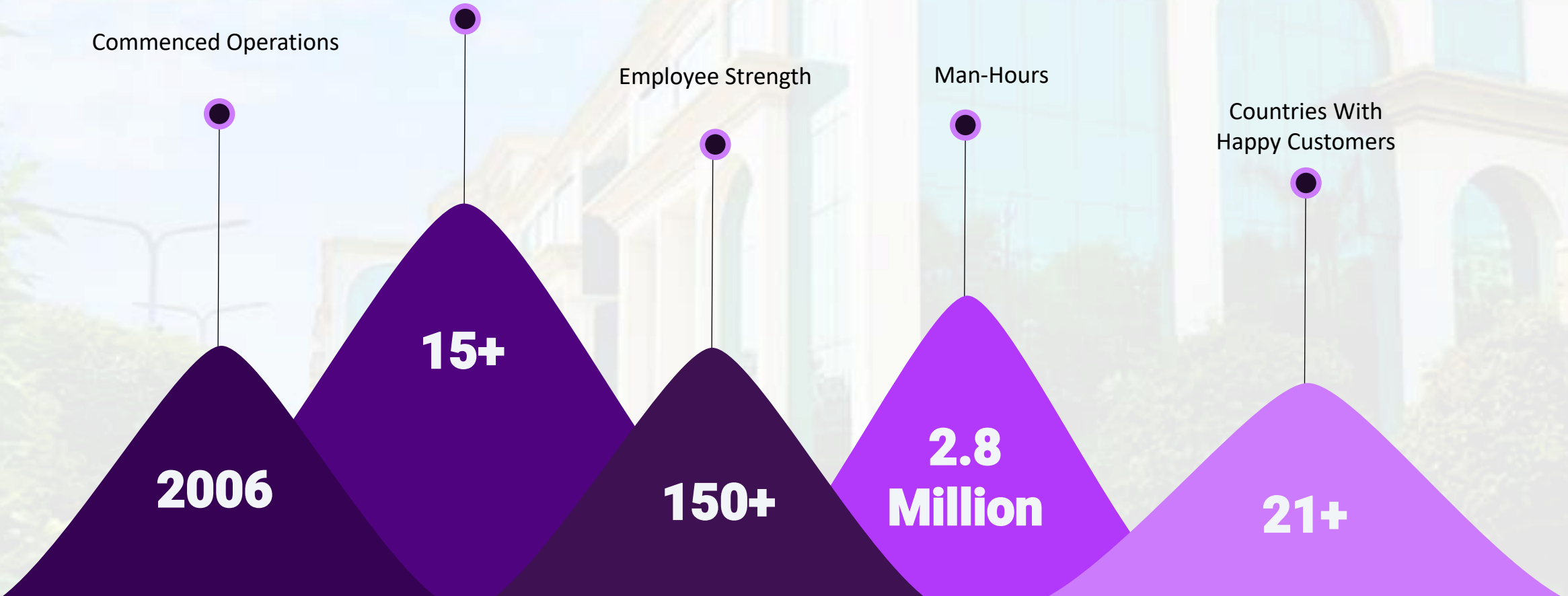
AVEVA

Agenda

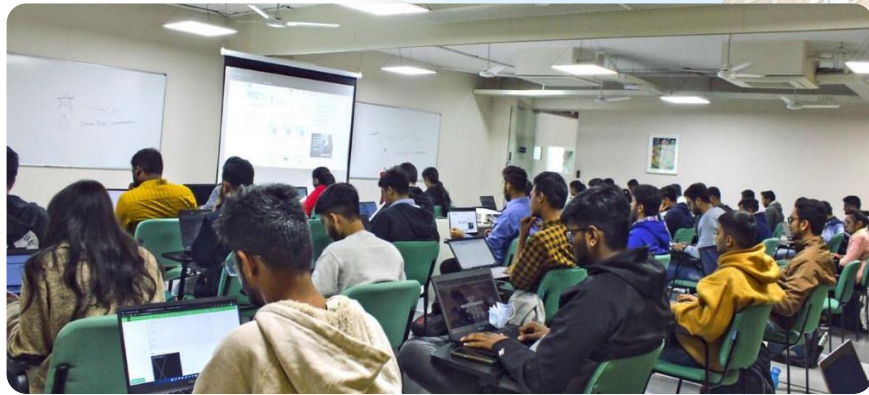
- 1) Rishabh Engineering – Journey so far...
- 2) Why We Recommend AVEVA™ solutions?
- 3) Real-life Use Cases

Rishabh Engineering At A Glance

Diversified Project Experience

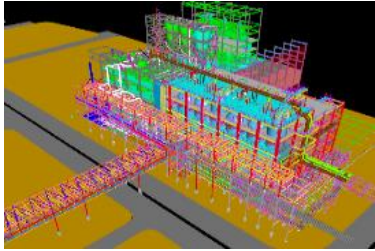


Rishabh Engineering Infrastructure



DOMAIN FOCUS (PROJECT PORTFOLIO)

Chemical



Chemical Plant



Industrial Furnaces & Direct Fired Heaters



Air Cooler Condenser Unit



Effluent Treatment Plant



Air Separation Unit

Oil & Gas



FPSO



Tank Farm Terminal



HRSG Units



Flare Package



Power Plant

DOMAIN FOCUS (PROJECT PORTFOLIO)

Hydrogen & CCU/ Decarbonization



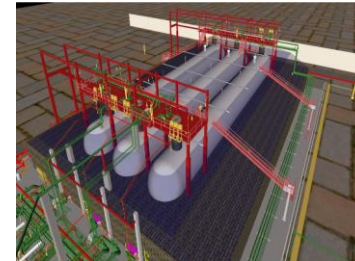
Hydrogen



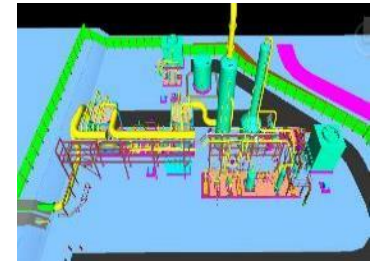
Natural Gas Conversion
Facility



Gas Compressor Station

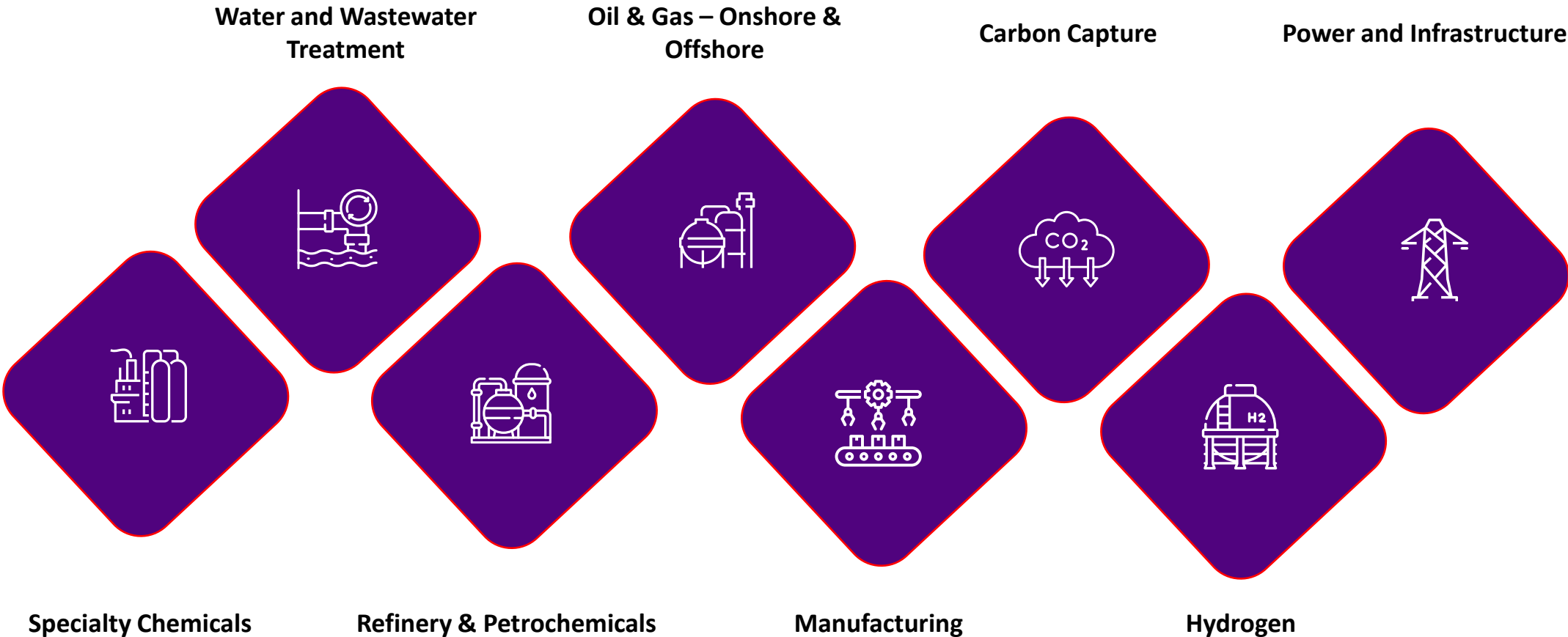


LPG Storage Plant



Carbon Capture

Industries We Serve



Project Synopsis – Case 1

Client: An American multinational energy corporation engaged in every aspect of the oil and natural gas sector.

Scope: FEED & Detailed engineering of Production Modules on Topside FPSO project located in West Africa

- Steel Tonnage Handled: **3433 Tons**
- No of lines (Flange Type Handled): **10000**
- Total no of lines: **247**
- Critical lines identified for Piping Stress Analysis: **101**
- Temperature & Pressure: Max. Design Pressure **551.7 bar(g)** & Max. design Temp. **198.8 deg. C, Rating-10000**
- Name of the modules: **7S** (Essential Generator Set), **4P** (Gas Metering Unit) & **3P** (Sea Water Injection)

How AVEVA™ Solutions Helped Us?

Engineering

COST OPTIMIZATION

AUTOMATION of BOQ Extraction for
Ease of Procurement Support

EASE Of Working

Scenario 1

OIL & GAS FPSO UNIT | Nigeria

Cost Optimization

Challenge

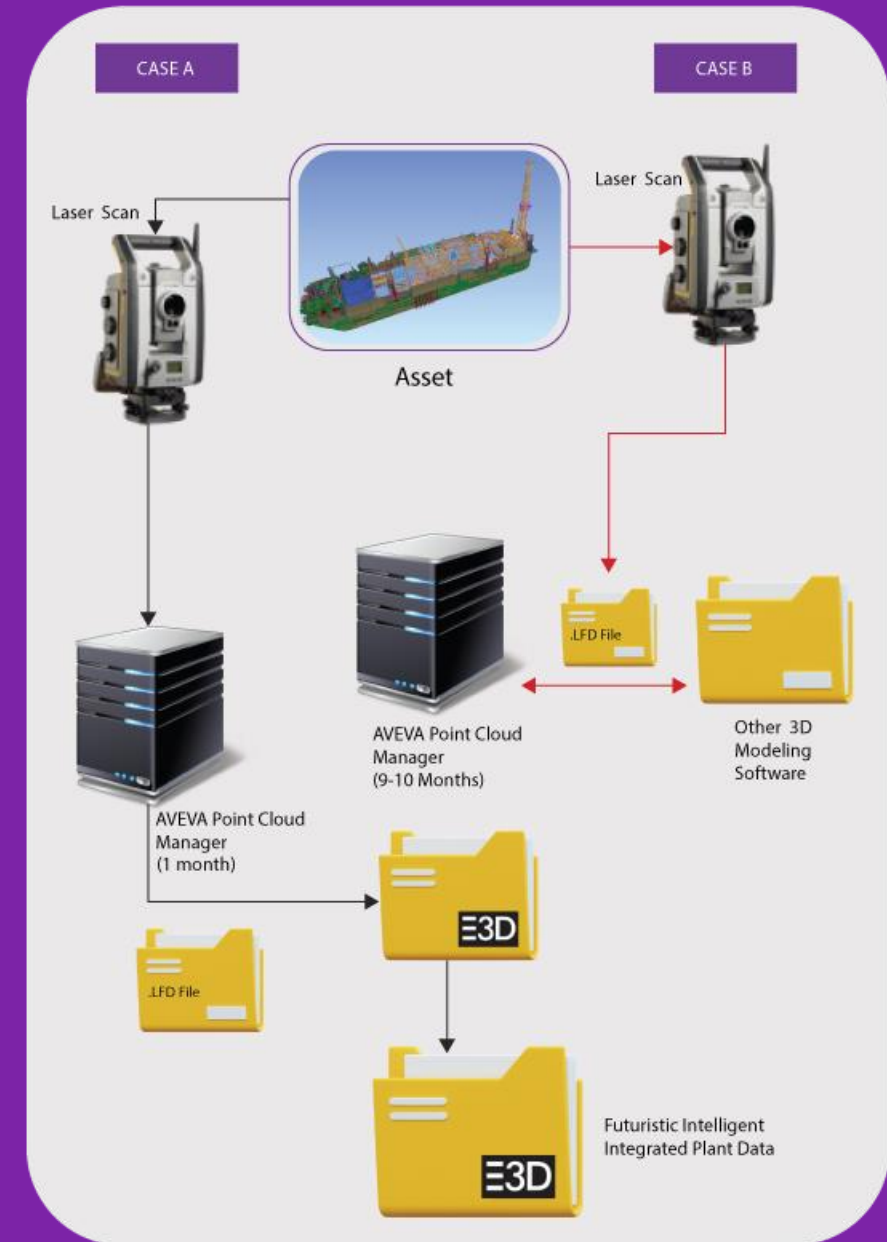
- Laser scan to AVEVA™ E3D Design integration & cost control?
- CASE B: Additional cost on LFM server licensing
- CASE B: Additional effort with loss of productivity
- Managing project schedule & timeline

Solution

Utilized AVEVA™ E3D Design over other 3D modeling products with just a 1-month effort to convert scan data to .LFD file while saving **efforts** on **time**, and **cost** while aligning to project schedule.

Results

- **COST: 7% of saving** on engineering project costs by utilizing AVEVA™ E3D Design platform
- **TIME: Engineering efforts by 9 -10 months**



Scenario 2

OIL & GAS FPSO UNIT | Nigeria

Automation and Customization of BOQ Extraction for Ease of Procurement Support

Challenge

- Lack of visibility to plan procurement scheduling with limitation of conventional BOQ format

Solution

- Created a customized data base in line with client requirements (mutually agreed format) in specified BOQ format in line with their procurement needs

Results

- 20% time saving, ~100% accuracy with optimal quality standards
- Negligible Data Loss
- ~100% customized data centralization as value addition

The screenshot displays the AVEVA software interface. A 'Modify Report Template' dialog box is open, showing options for destination, filename (d:\Pipe-BOQ.CSV), selection (BRANCH MEM), with, hierarchy (/P375D), and columns (1 SITE, 2 ZONE, 3 LINE, 4 TYPE, 5 P1BORE, 6 P2BORE, 7 P3BORE, a nesc). Below the dialog is a circular diagram with 'W', 'U', 'E', and 'S' labels. The main window shows a data table with columns: LINE NUMBER, TYPE, SIZE, DESCRIPTION, MATERIAL, PIPE LENGTH (OLD), PIPE LENGTH (NEW), Line size, Piping schedule, Flange Rating, Length Feet (OLD), Length Feet (NEW), and No. of Welded Fittings (C).

| LINE NUMBER | TYPE | SIZE | DESCRIPTION | MATERIAL | PIPE LENGTH (OLD) | PIPE LENGTH (NEW) | Line size | Piping schedule | Flange Rating | Length Feet (OLD) | Length Feet (NEW) | No. of Welded Fittings (C) |
|------------------------------|------|-------|---|--|-------------------|-------------------|-----------|-----------------|---------------|-------------------|-------------------|----------------------------|
| P140-1.1/2"-M-G4-388763 | TUBI | 40mm | PIPE BE SMLS SCH XXS ASME B36.10M | CS ASTM A106-B | 0.00 | 0.00 | 1.5" | XXS | | 0.00 | 0.00 | |
| P140-1.1/2"-M-G4-388763 | FLAN | 40mm | HUB A182 GR.F51 #10000 SCH.160 B.E SPEC:K4 | -- | | | 1.5" | | 10000 | | | 0 |
| P140-1.1/2"-M-G4-388763 | FLAN | 40mm | FLANGE WN RF CL2500 SCH XXS ASME B16.5 | CS ASTM A105N | | | 1.5" | | 2500 | | | 0 |
| 330D-1"-HF-ESD01X-679539 | FLAN | 25mm | FLANGE WN RF 1500# SCH 805 ASME B16.5 | SS ASTM A182-F316/316L | | | 1" | | 1500 | | | 1 |
| 500D-4"-FW-N3-049901 | FLAN | 100mm | CU-NI WELDNECK FLANGE CL.150 FF | UNS C70600 THK.3.0MM | | | 4" | | 150 | | | 1 |
| 140D-3"-DO-ACS11X-529491 | TUBI | 200mm | PIPE BE SMLS SCH STD ASME B36.10M | CS ASTM A106-B | 0.00 | 0 | 3" | STD | | 0.00 | 0 | |
| 140D-1.5"-M-FSX01GX-388763 | TUBI | 40mm | PIPE BE SMLS SUPER DUPLEX SS SCH XXS SMLS ASME B36.10M | ASTM A790 UNS S32750 | 0.00 | 1320 | 1.5" | XXS | | 0.00 | 4.3296 | |
| 140D-1.5"-M-FSX01GX-388763 | FLAN | 40mm | FLANGE WN RF 2500# SUPER DUPLEX SS SCH XXS ASME B16.5 | ASTM A182-F53 | | | 1.5" | | 2500 | | | 7 |
| 433D-10"-PG-KCT13X-589640-PP | FLAN | 250mm | FLANGE COMPACT WN, CL 10000# WT1.358" ASME Sect. VIII Div. 1 Appendix 2 AND MFR STD | AS AISI 4130N or QT W/75000 PSI MIN CVN -20F | | | 10" | | 10000 | | | 0 |
| 443D-10"-PG-KCT13X-589640-PP | TUBI | 250mm | PIPE BE SMLS WT 1.270" ASME B36.10M | CS AP1 3L-X8000 PSL 2 MODIFIED CVN -20F | 6,276.26 | 5707 | 10" | 1.270" | | 20.59 | 18.71896 | |
| 265D-2"-HF-ESD01X-679543 | TUBI | 50mm | PIPE BE SMLS SCH 805 ASME B36.19M | SS ASTM A312-TP316/316L | 3,113.67 | 3114 | 2" | 805 | | 10.22 | 10.21392 | |

Automation and Customization of BOQ Extraction – How it Works?

The screenshot displays the AVEVA software interface with a 'Modify Report Template' dialog box open. The dialog box is titled 'Modify Report Template C:\Users\Public\Documents\AVEVA\USE...' and has tabs for 'File', 'Page Info', 'Options', and 'Help'. The 'Destination' section includes radio buttons for 'Screen', 'Overwrite', 'New' (selected), and 'Append'. The 'Filename' field contains 'd:\Pipe-BOQ.CSV'. The 'Selection' section has a 'Type(s)' field with 'BRANCH MEM', an empty 'With' field, and a 'Hierarchy' field with '/P375D'. The 'Columns' section shows a list of 8 items: 1 SITE, 2 ZONE, 3 LINE, 4 TYPE, 5 P1BORE, 6 P2BORE, 7 P3BORE, and 8 DESC. Below the list are buttons for 'New...', 'Modify...', 'Move...', and 'Delete'. At the bottom of the dialog are 'Apply' and 'Cancel' buttons, with a mouse cursor pointing to 'Apply'. The background shows the software's main interface with a menu bar (PROJECT, HOME, VIEW, TOOLS, MANAGE, DESIGN AIDS, GENERAL, EQUIPMENT, PIPING, ADMIN) and a 'Model Explorer' tree view listing various project items under 'P375D'.

Automation and Customization of BOQ Extraction – How it Works?

| | B | C | D | E | H | I | J | K | P | Q | R | S | T | U | V |
|------|---------------|------------------------------|------|-------|---|--|-------------------|-------------------|-----------|-----------------|---------------|-------------------|-------------------|------------------------------|------------------------------|
| | LOCATION Code | LINE NUMBER | TYPE | SIZE | DESCRIPTION | MATERIAL | PIPE LENGTH (OLD) | PIPE LENGTH (NEW) | Line size | Piping Schedule | Flange Rating | Length Feet (OLD) | Length Feet (NEW) | No. of Welded Fittings (OLD) | No. of Welded Fittings (NEW) |
| 1 | 3P | P140-1.1/2"-M-G4-388763 | TUBI | 40mm | PIPE BE SMLS SCH XXS ASME B36.10M | CS ASTM A106-B | 0.00 | 0.00 | 1.5" | XXS | | 0.00 | 0.00 | | |
| 2 | 3P | P140-1.1/2"-M-G4-388763 | FLAN | 40mm | HUB A182 GR.F51 #10000 SCH.160 B.E SPEC:K4 | -- | | | 1.5" | | 10000 | | | 0 | 0 |
| 7 | 3P | P140-1.1/2"-M-G4-388763 | FLAN | 40mm | FLANGE WN RF CL2500 SCH XXS ASME B16.5 | CS ASTM A105N | | | 1.5" | | 2500 | | | 0 | 0 |
| 8 | 3P | 330D-1"-HF-ESD01X-679539 | FLAN | 25mm | FLANGE WN RF 1500# SCH 80S ASME B16.5 | SS ASTM A182-F316/316L | | | 1" | | 1500 | | | 1 | 1 |
| 15 | 3S-ET | 500D-4"-FW-N3-049901 | FLAN | 100mm | CU-NI WELDNECK FLANGE CL.150 FF | UNS C70600 THK.3.0MM | | | 4" | | 150 | | | 1 | 0 |
| 228 | 4P-ET | 140D-3"-DO-ACS11X-529491 | TUBI | 200mm | PIPE BE SMLS SCH STD ASME B36.10M | CS ASTM A106-B | 0.00 | 0 | 3" | STD | | 0.00 | 0 | | |
| 300 | 4P | 140D-1.5"-M-FSX01GX-388763 | TUBI | 40mm | PIPE BE SMLS SUPER DUPLEX SS SCH XXS SMLS ASME B36.10M | ASTM A790 UNS S32750 | 0.00 | 1320 | 1.5" | XXS | | 0.00 | 4.3296 | | |
| 323 | 4P | 140D-1.5"-M-FSX01GX-388763 | FLAN | 40mm | FLANGE WN RF 2500# SUPER DUPLEX SS SCH XXS ASME B16.5 | ASTM A182-F53 | | | 1.5" | | 2500 | | | 7 | 7 |
| 329 | 4P | 433D-10"-PG-KCT13X-589640-PP | FLAN | 250mm | FLANGE COMPACT WN, CL 10000# WT1.358" ASME Sect. VIII Div. 1 Appendix 2 AND MFR STD | AS AISI 4130N or QT W/75000 PSI MIN CVN -20F | | | 10" | | 10000 | | | 0 | 0 |
| 662 | 4P | 443D-10"-PG-KCT13X-589640-PP | TUBI | 250mm | PIPE BE SMLS WT 1.270" ASME B36.10M | CS API 5L-X60QO PSL 2 MODIFIED CVN -20F | 6,276.26 | 5707 | 10" | 1.270" | | 20.59 | 18.71896 | | |
| 996 | 7S-B-ET | 265D-2"-HF-ESD01X-679543 | TUBI | 50mm | PIPE BE SMLS SCH 80S ASME B36.19M | SS ASTM A312-TP316/316L | 3,113.67 | 3114 | 2" | 80S | | 10.22 | 10.21392 | | |
| 1020 | | | | | | | | | | | | | | | |

LINE BY LINE



| | | | | | | | | | | | | | | |
|----|-------------------------|------|------|---|----|--|--|------|--|-------|--|--|---|---|
| 3P | P140-1.1/2"-M-G4-388763 | FLAN | 40mm | HUB A182 GR.F51 #10000 SCH.160 B.E SPEC:K4 | -- | | | 1.5" | | 10000 | | | 0 | 0 |
|----|-------------------------|------|------|---|----|--|--|------|--|-------|--|--|---|---|

| | | | | | | | | | | | | | | |
|----|------------------------------|------|-------|---|--|--|--|-----|--|-------|--|--|---|---|
| 4P | 433D-10"-PG-KCT13X-589640-PP | FLAN | 250mm | FLANGE COMPACT WN, CL 10000# WT1.358" ASME Sect. VIII Div. 1 Appendix 2 AND MFR STD | AS AISI 4130N or QT W/75000 PSI MIN CVN -20F | | | 10" | | 10000 | | | 0 | 0 |
|----|------------------------------|------|-------|---|--|--|--|-----|--|-------|--|--|---|---|

Scenario 3

OIL & GAS FPSO UNIT | Nigeria

Ease of Working

Challenge

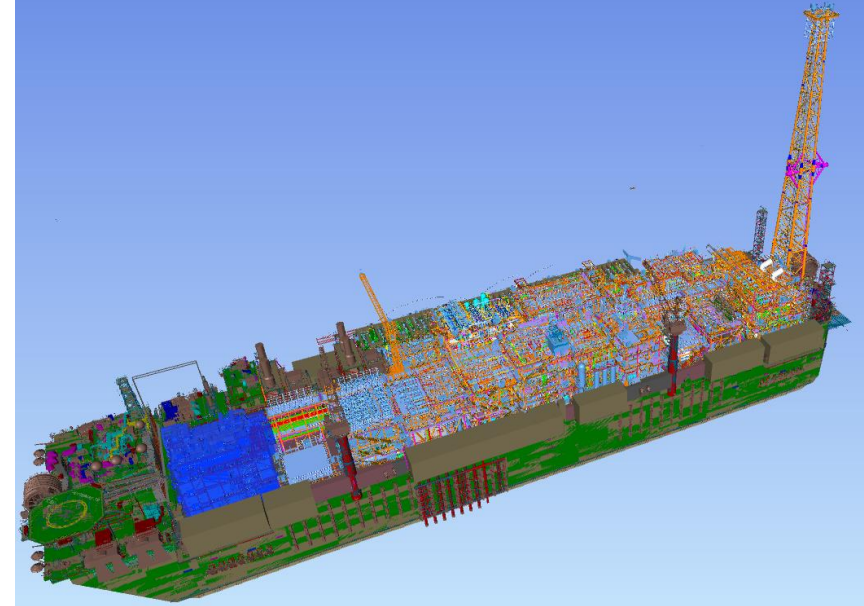
- Limited database capability of other 3D modeling tools to handle/manage large and standardized database volume

Solution

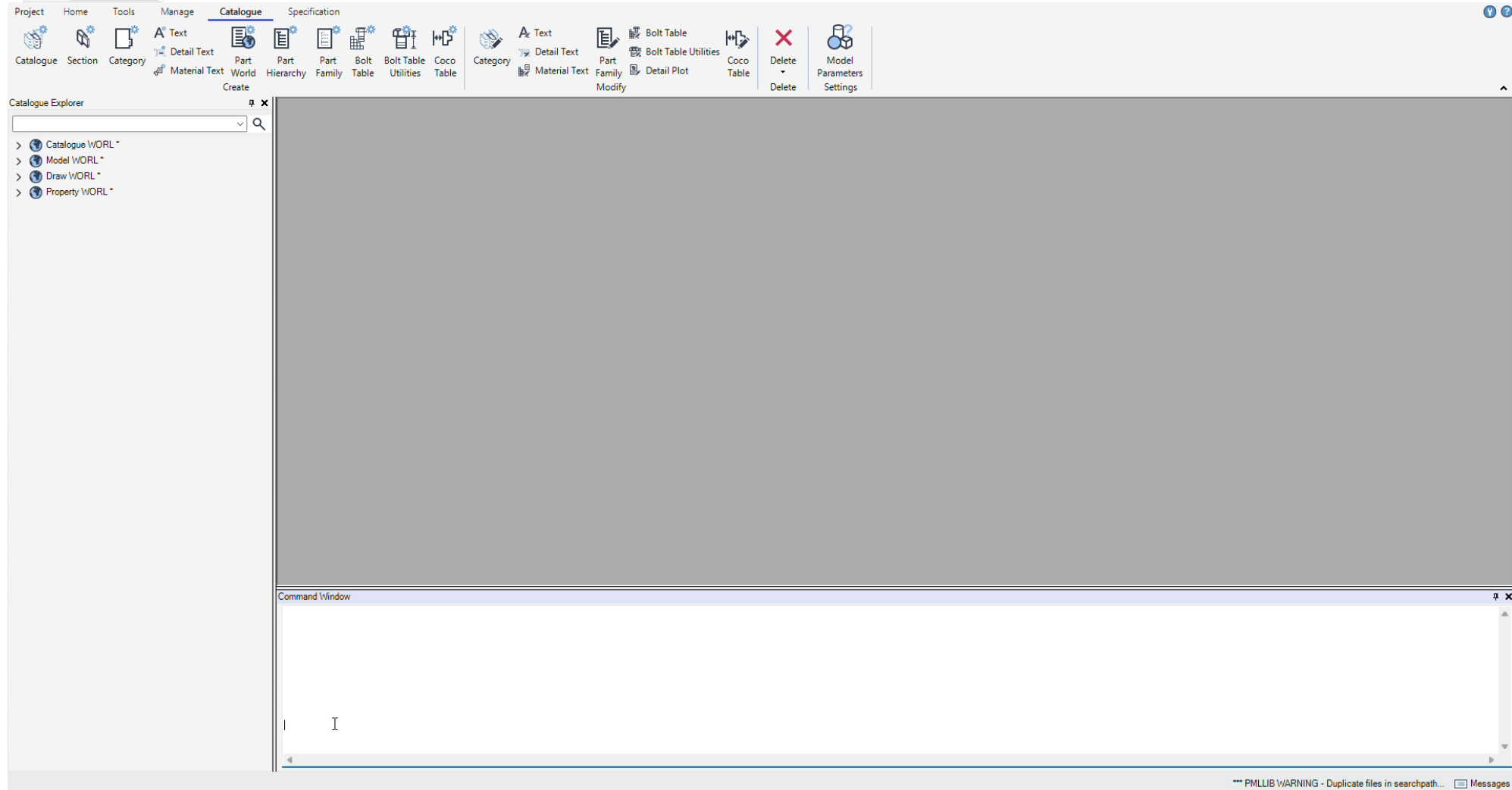
- AVEVA™ E3D Design helped seamlessly manage huge database volume while ensuring data standardization protocols

Results

- **Saved 2x time** on database management while adhering to the optimal schedule and quality



Ease of Working – Use Case



Project Synopsis – Case 2

Client: Asia-based leading Indian manufacturer of specialty chemicals and pharmaceutical

Scope: Brownfield chemical plant expansion project (Buss IV)

- Steel Tonnage Handled: **250 tons**
- No of lines: **201**
- Critical lines for Pipe Flexibility Analysis: **46**

How AVEVA™ Solutions Helped Us?

EFFORT OPTIMIZATION

Deliverable ACCURACY

Interoperability between AVEVA E3D & Trimble TEKLA

Challenge

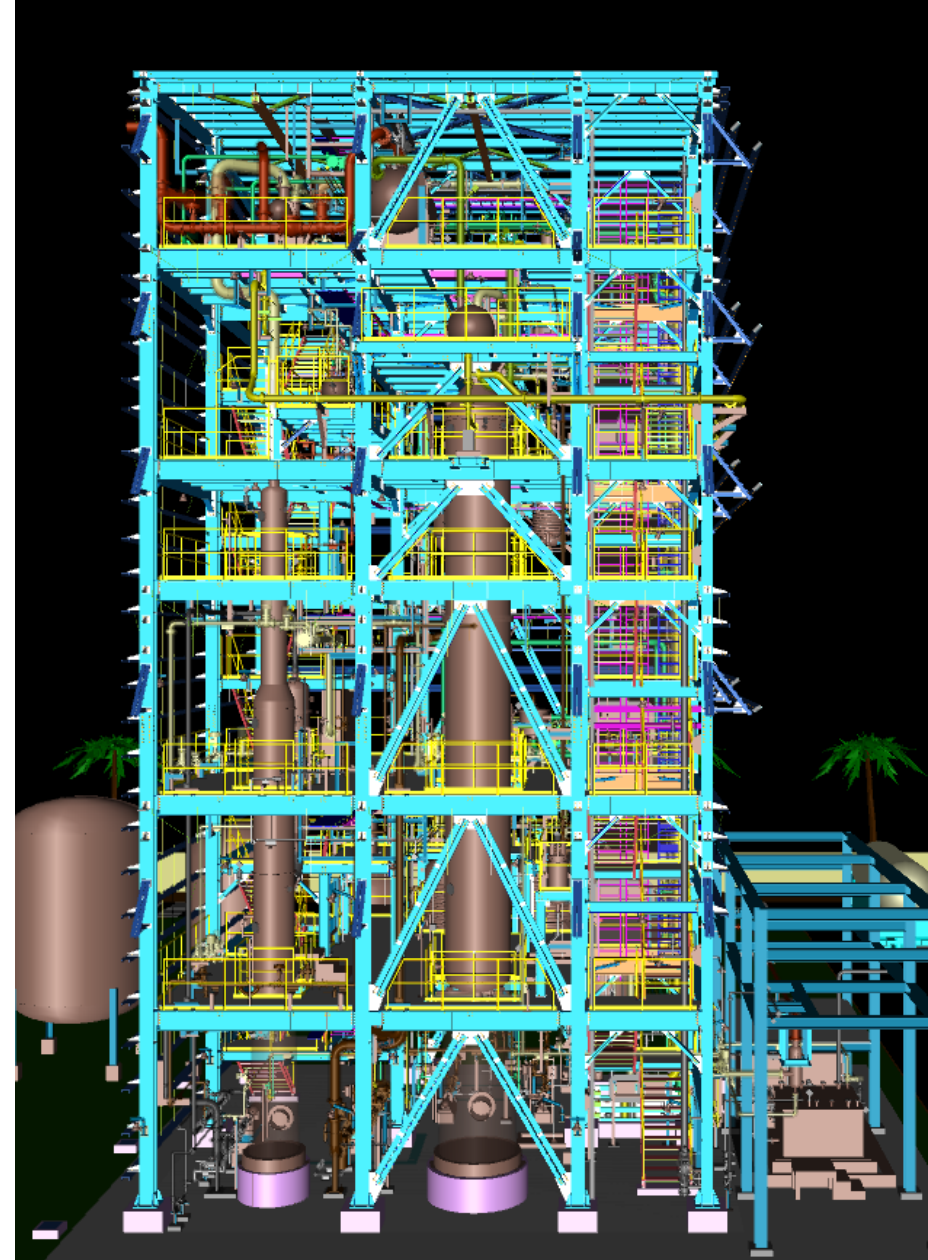
- Challenge with utilizing other 3D modeling software with TEKLA to review
- Additional effort to manage both tools simultaneously
- Accuracy challenges with output generated

Solution

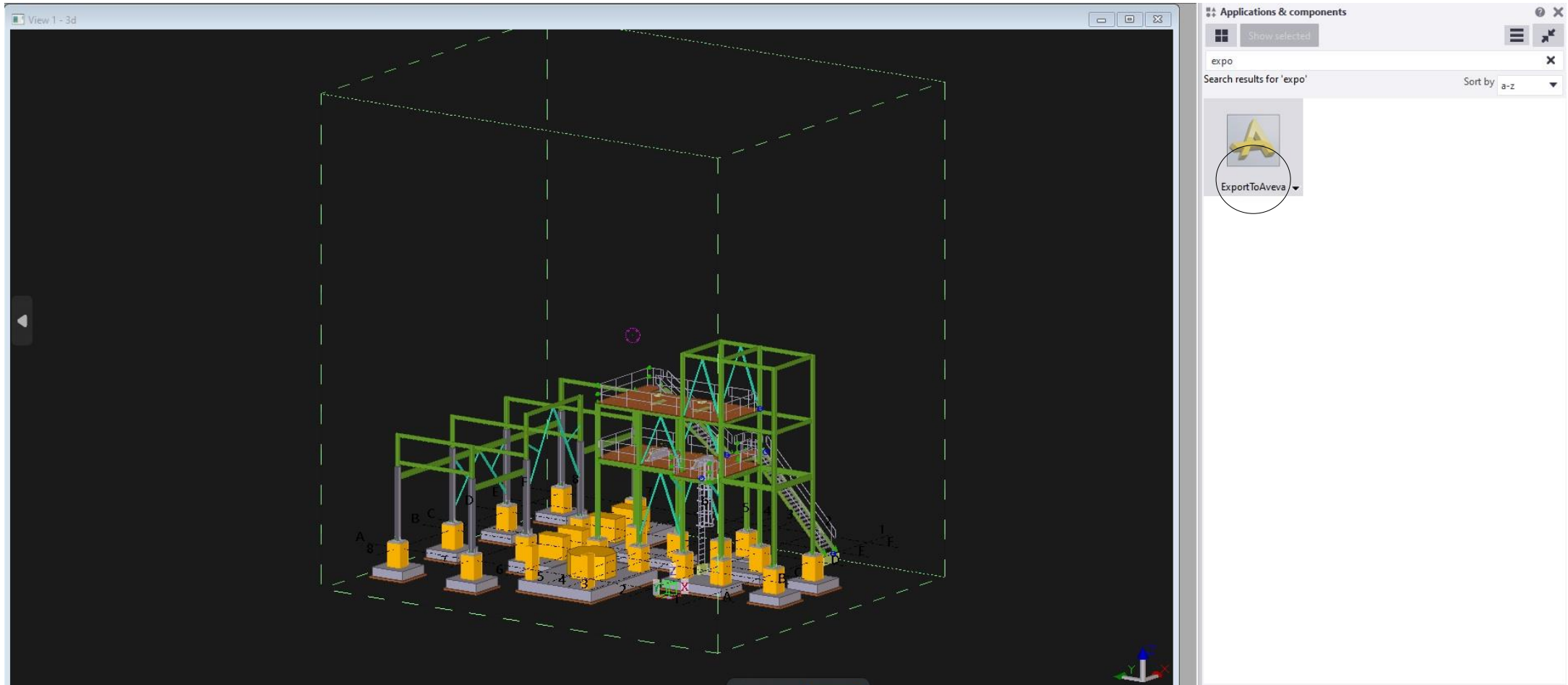
- Utilized AVEVA™ E3D Design as a one source tool to export TEKLA model to compare, review and modify structural design

Results

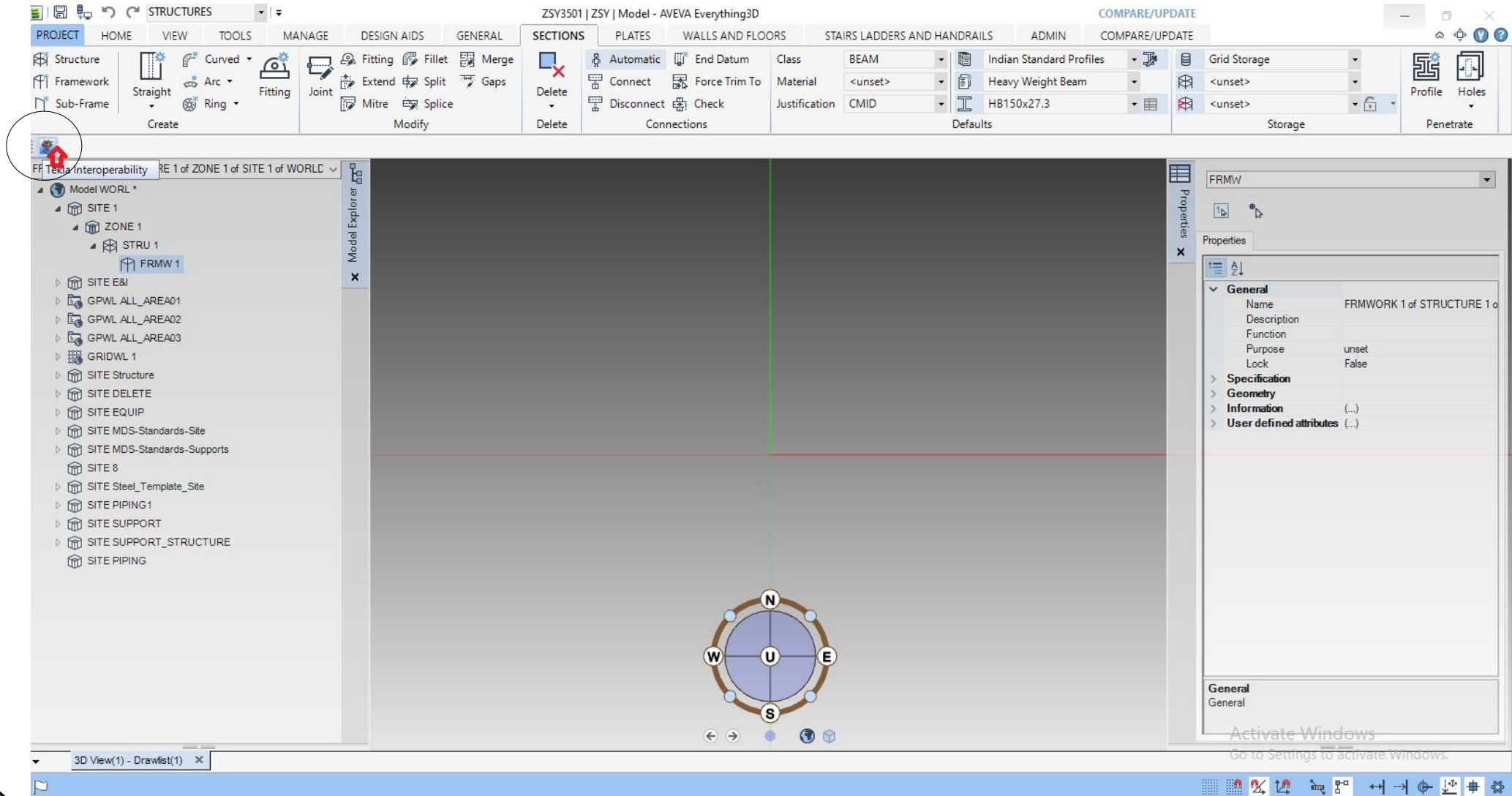
- Helped **save 30%** efforts on correlation and correction efforts
- **~100% accuracy** with model deliverables to help keep up with the project timeline



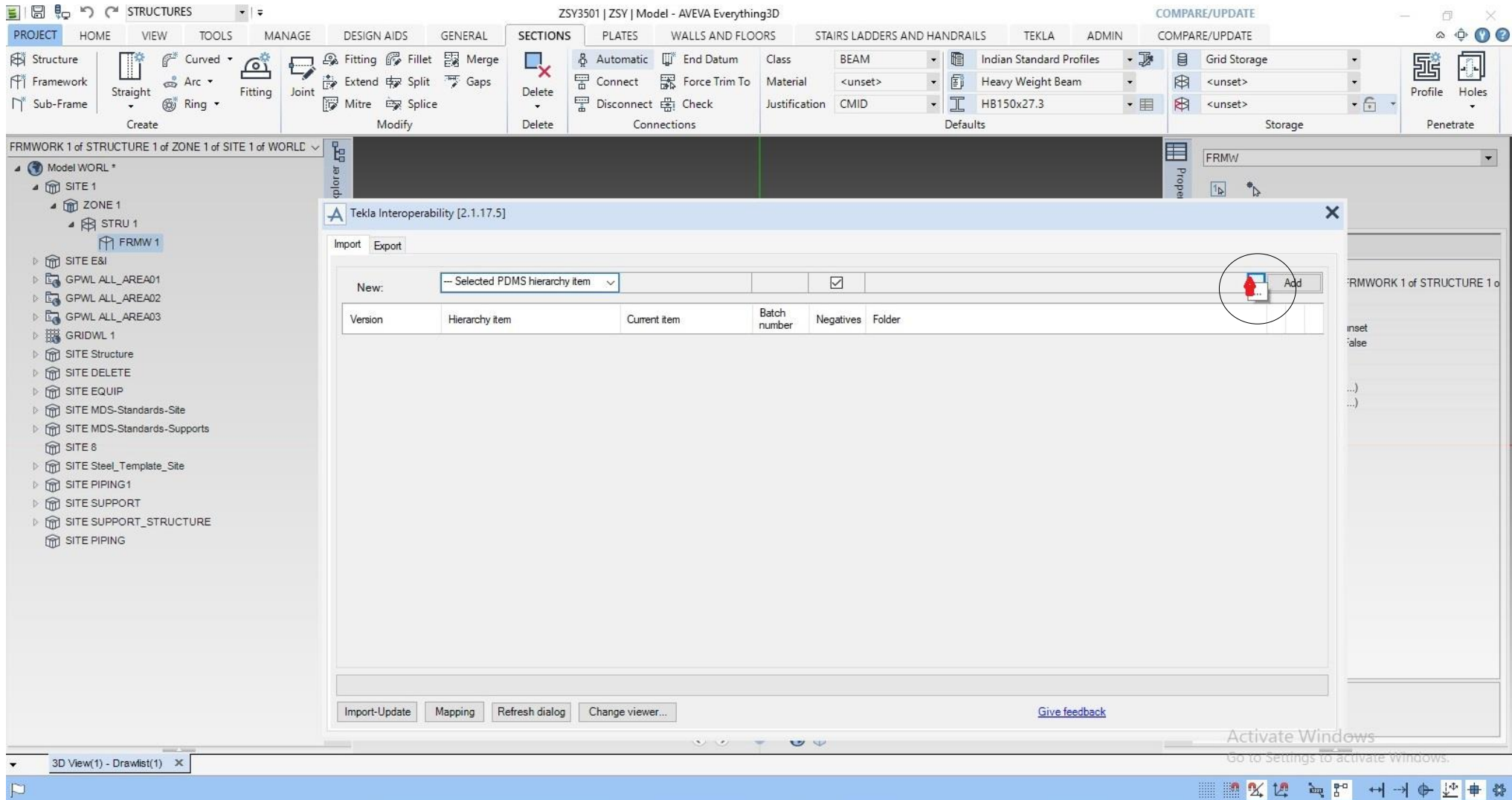
STEP 1



STEP 2



STEP 3



STEP 4

The screenshot shows the Tekla software interface with a 'Tekla Interoperability [2.1.17.5]' dialog box open. The dialog has 'Import' and 'Export' tabs. Under the 'Import' tab, there is a 'New:' field with a dropdown menu showing '-- Selected PDMS hierarchy item' and 'ITEM_NO_09'. Below this is a table with the following data:

| Version | Hierarchy item | Current item | Batch number | Negatives | Folder |
|-----------------|----------------|--------------|--------------|-------------------------------------|-----------------|
| 20230929-060349 | 2013286748/322 | ITEM_NO_09 | | <input checked="" type="checkbox"/> | X:\Hiren Gajera |

The 'Version' cell '20230929-060349' is circled in red. The entire row is highlighted in yellow. At the bottom of the dialog, there are buttons for 'Import-Update', 'Mapping', 'Refresh dialog', and 'Change viewer...'. A 'Give feedback' link is also present. The background shows the Tekla software interface with various toolbars and a 3D view of a structure.

STEP 5

Tekla Interoperability [2.1.17.5]

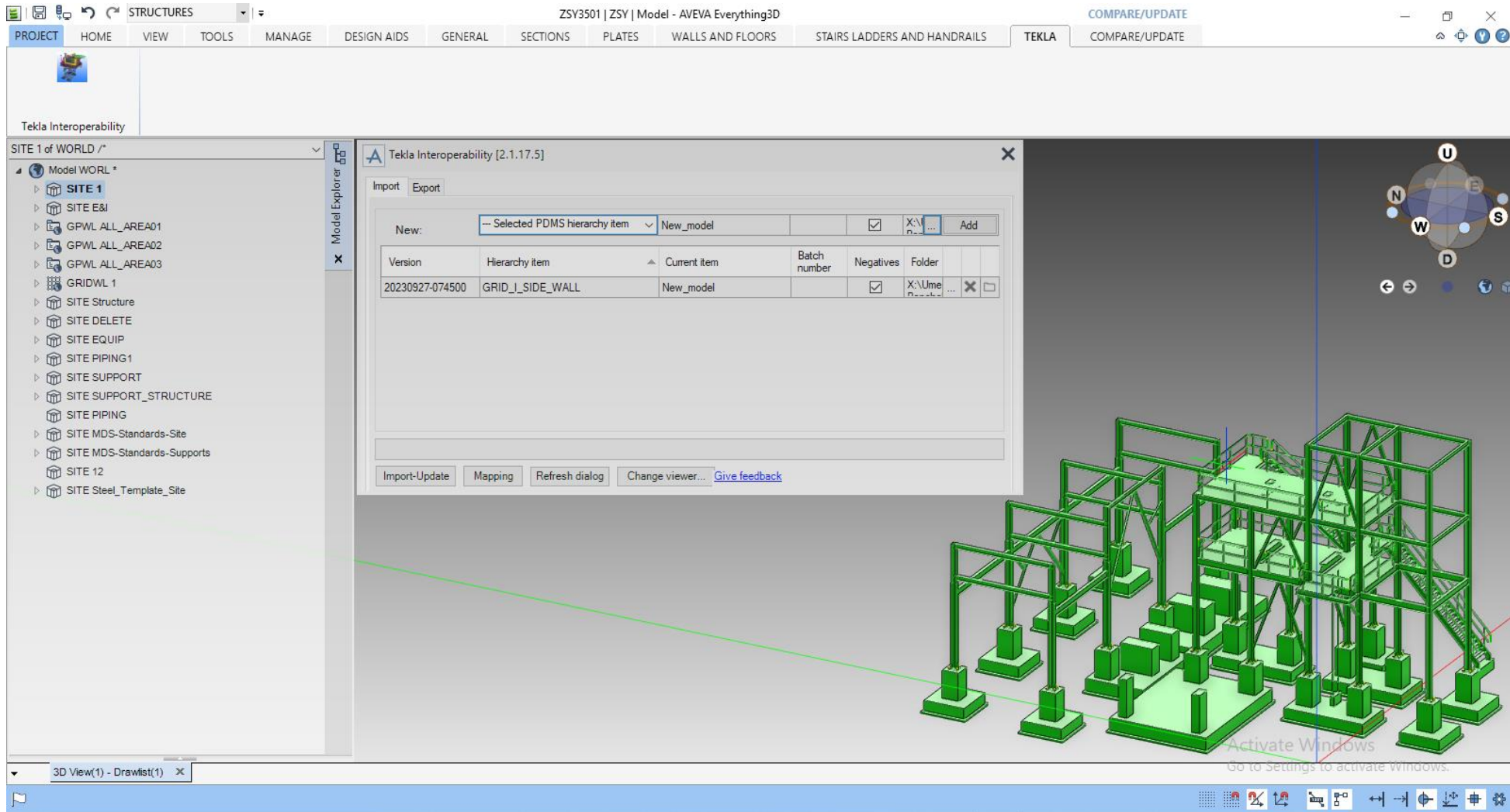
Import | Export

New: -- Selected PDMS hierarchy item | ITEM_NO_09 | | X:\Hiren Gajera\ITEM_NO_09#20230929-060349.tcZip | Add

| Version | Hierarchy item | Current item | Batch number | Negatives | Folder |
|-----------------|----------------|--------------|--------------|-------------------------------------|-----------------|
| 20230929-060349 | 2013286748/322 | ITEM_NO_09 | | <input checked="" type="checkbox"/> | X:\Hiren Gajera |

Import-Update | Mapping | Refresh dialog | Change viewer... | [Give feedback](#)

STEP 6





Rishabh Engineering Commitment

“Our expertise extends beyond technical skills. We deeply understand client needs to deliver value beyond cost, time, and quality. We’re specialists who care and are committed to client success.”

Naveen Raj Pal

Deputy General Manager –
Business Acquisition



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- +91 8511149103



Questions?

Please wait for the microphone.
State your name and company.



Please remember to...

Navigate to this session in the mobile app to complete the survey.



Thank you!

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ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

Learn more at www.aveva.com