



AVEVAWORLD
PARIS

AVEVA WORLD
PARIS

OCTOBER 2024

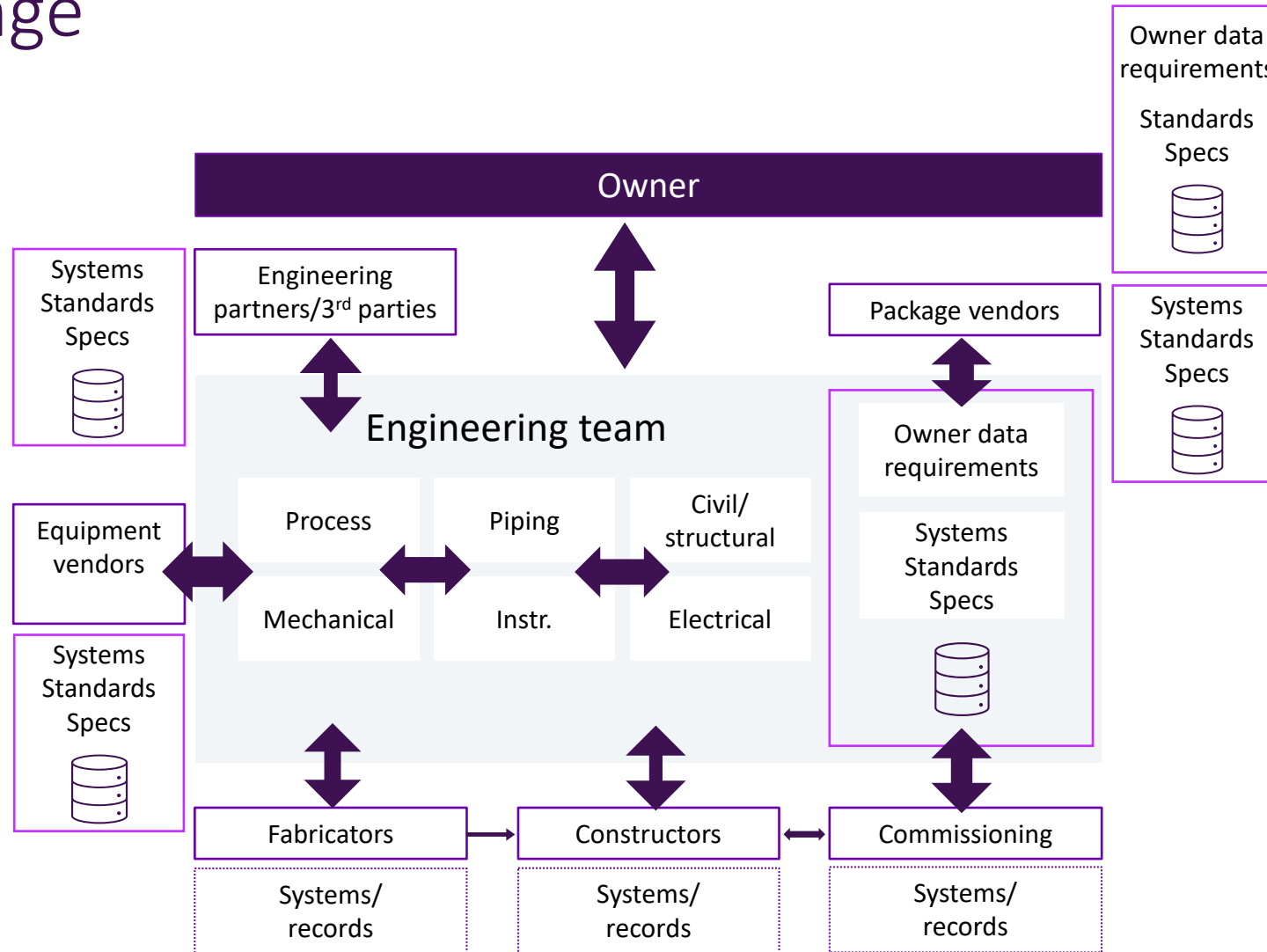
Unified Engineering 3.0

The Green Hydrogen Story

Brian Hughes & Marcel Proesch

AVEVA

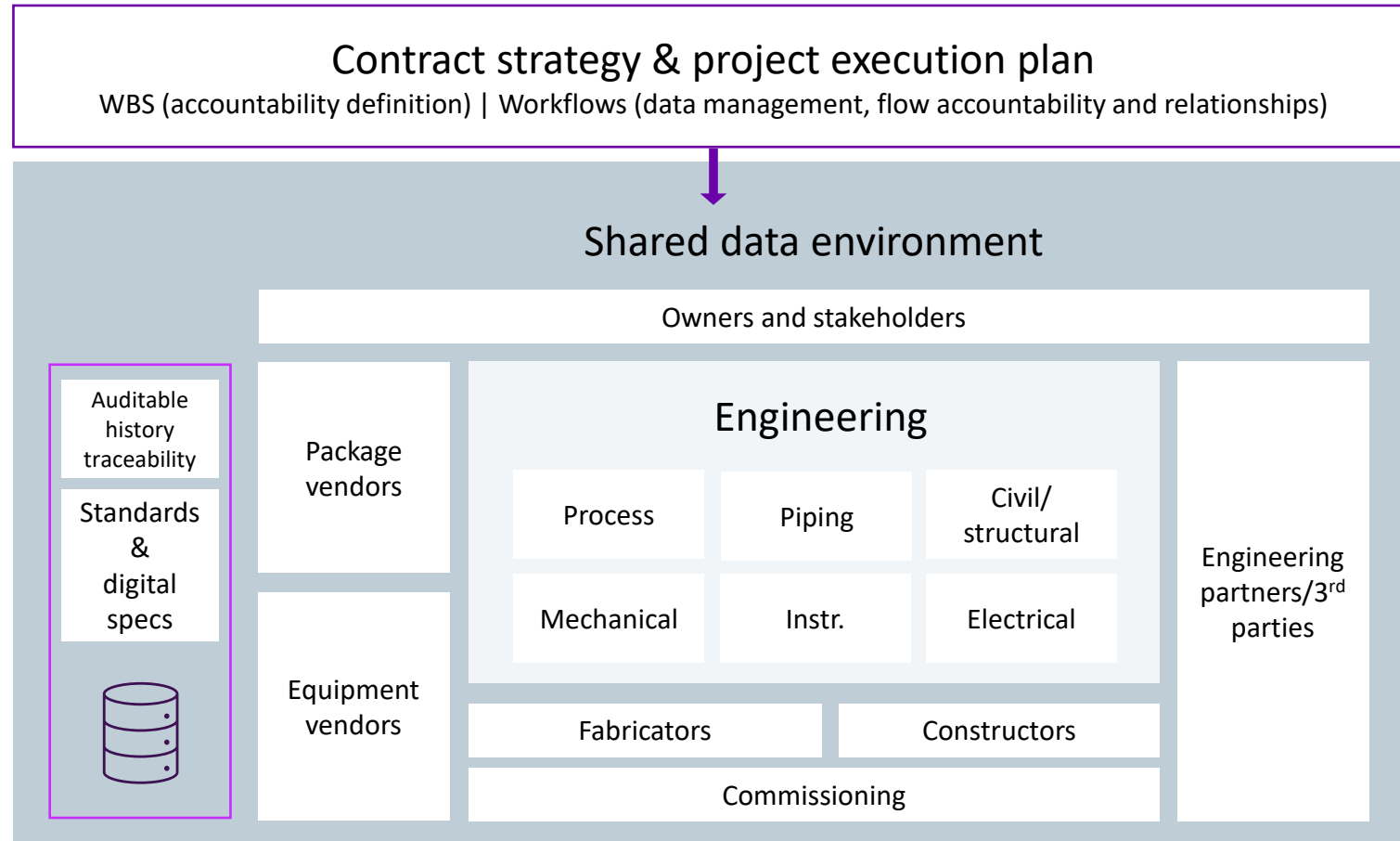
The Challenge



Engineering 3.0

Disconnected systems, teams and project data

The Challenge



Engineering 4.0

Connected systems, teams and project data

The Challenge

Collaboration challenges for current solutions



Multiple technologies drive incremental cost and have performance limitations



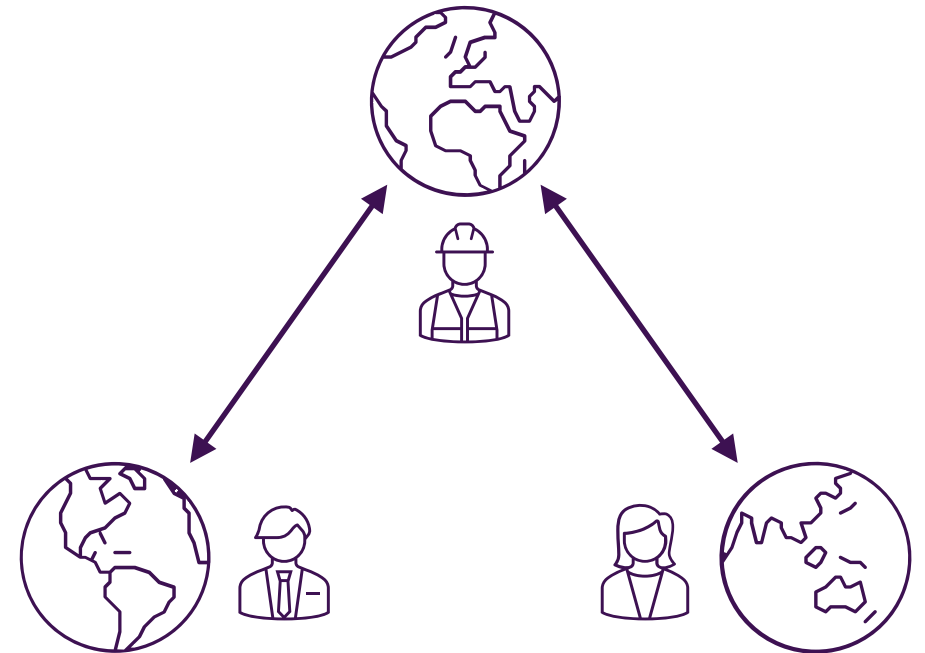
Significant time and cost for both setup and maintenance require experienced resources



IT security and data access controls demands limit extent of data sharing and collaboration



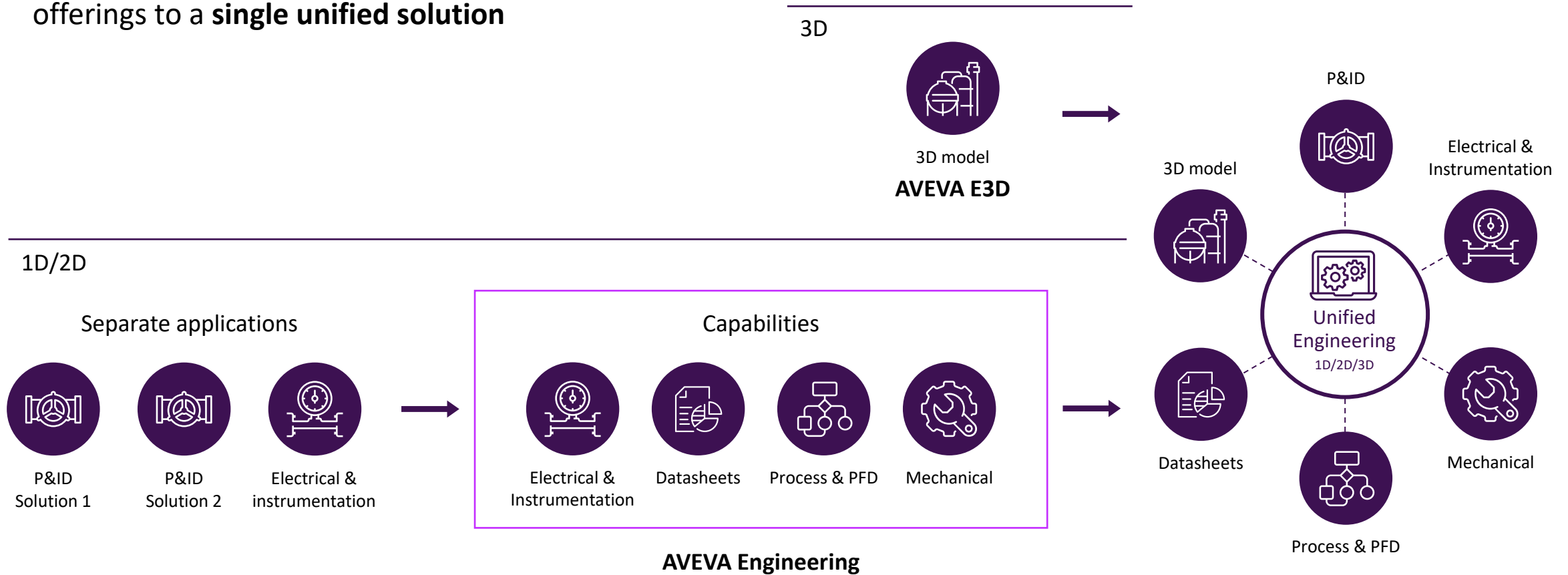
Brittle configurations that cannot be adjusted as projects, facilities, and businesses mature



AVEVA™ Unified Engineering

Evolution to a single unified solution

Evolving from separate commercial and technical offerings to a **single unified solution**



AVEVA™ Unified Engineering 3.0



Process engineer

SIMULATE
set parameters
for high wind case



**RELEASE TO
ENGINEERING**
design cases



IMPORT
design cases
update functional
item & PFD



UPDATE
functional item
datasheet



CREATE
standby pump
and update PID



UPDATE
KOL, cable sizing,
cabling



UPDATE
major equipment,
piping, cabling



UPDATE
cable length
from 3D



Iteration process



Mechanical engineer



Seamless solution integration



Electrical engineer



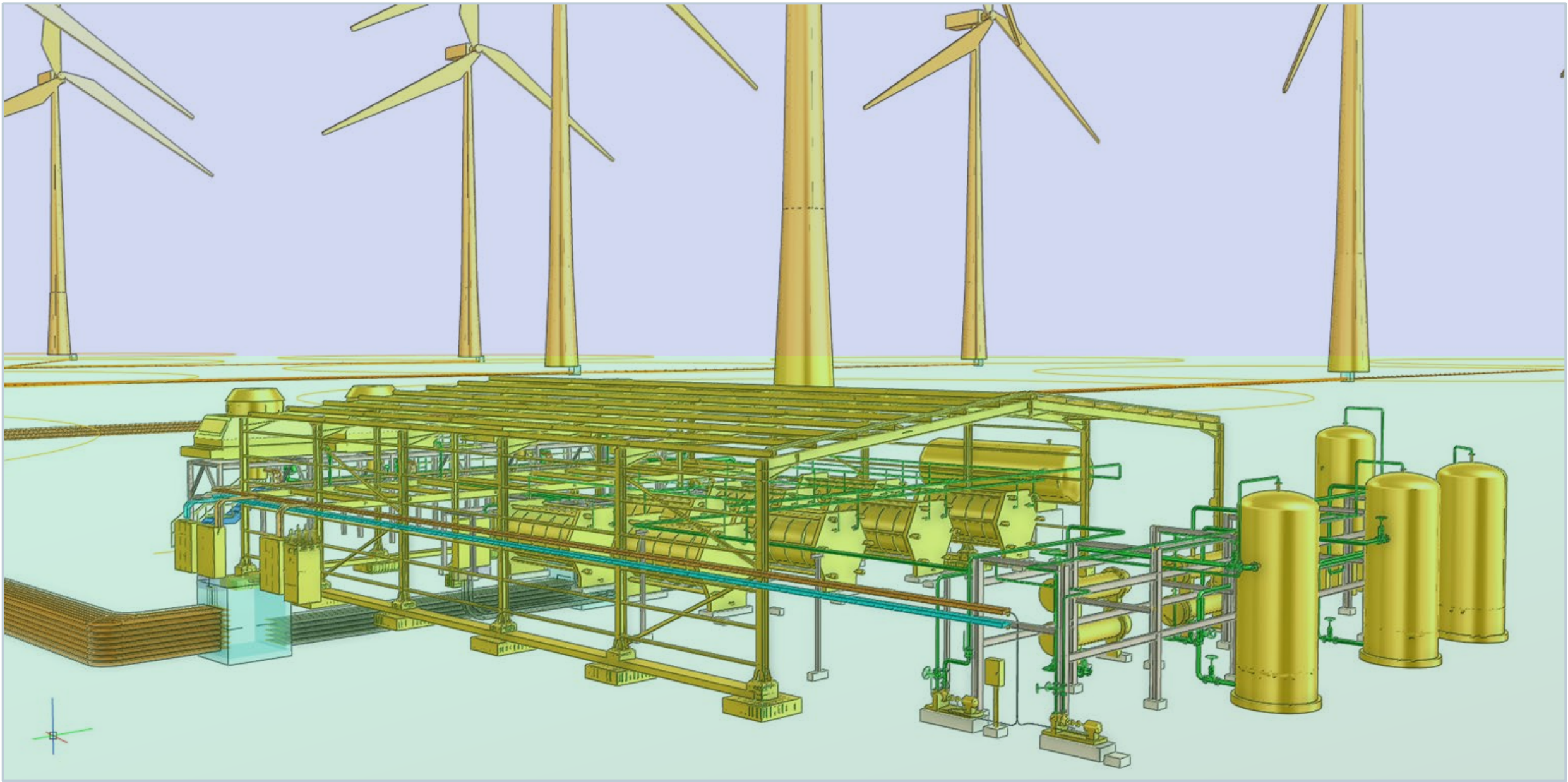
Seamless solution integration



Design engineer



Data in context

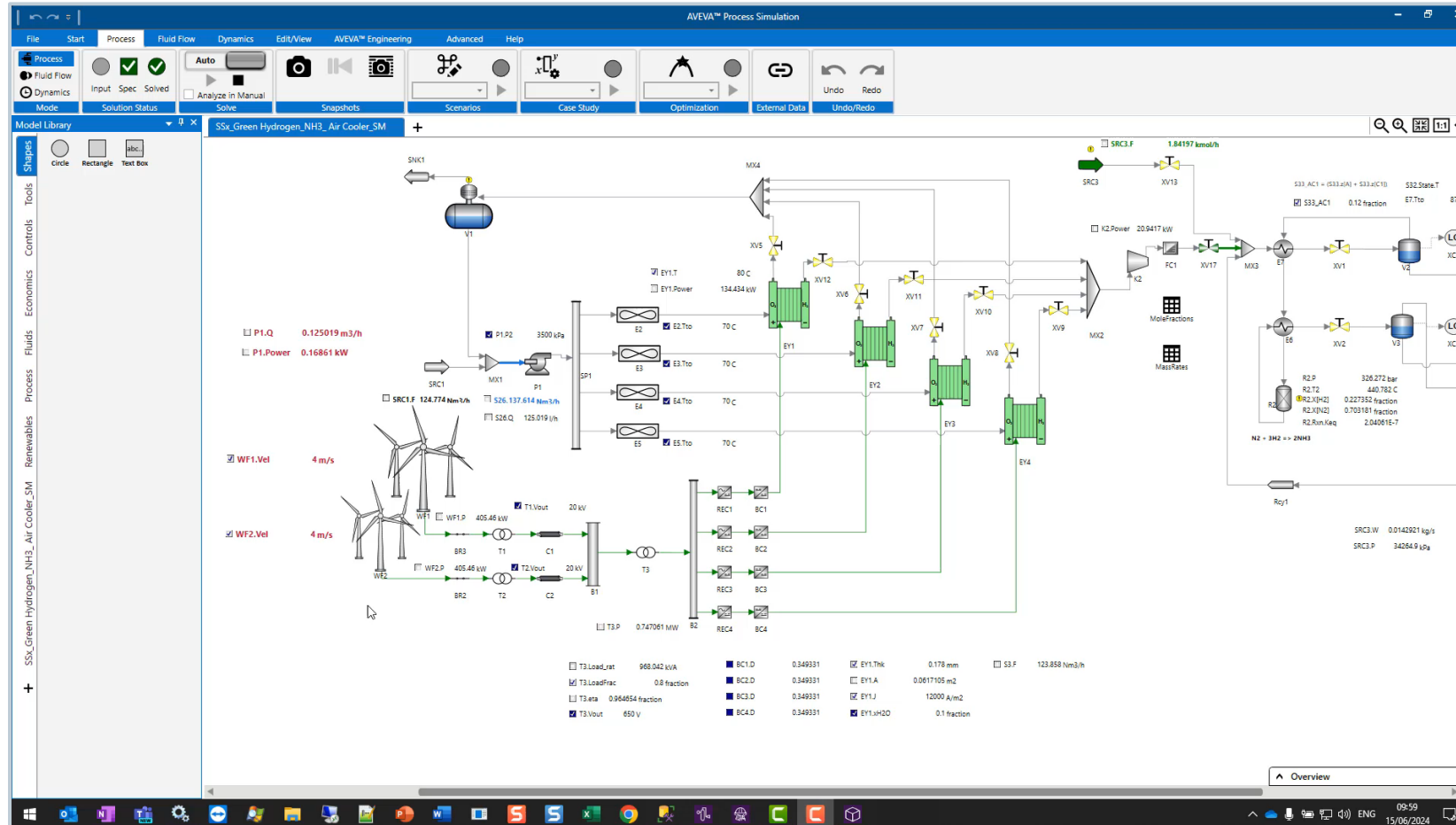




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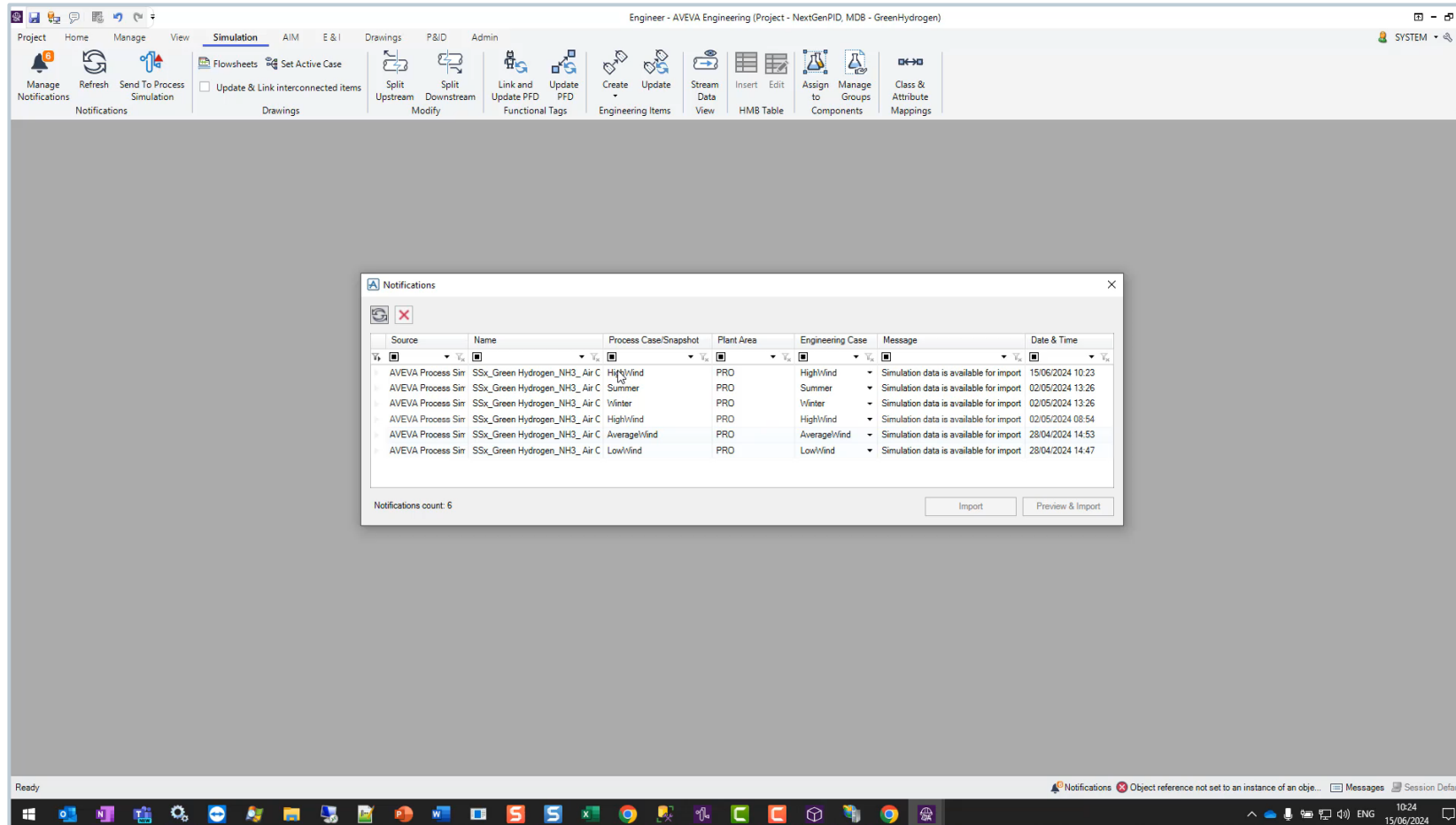
AVEVA™ Process Simulation

Simulate high wind case and publish to engineering



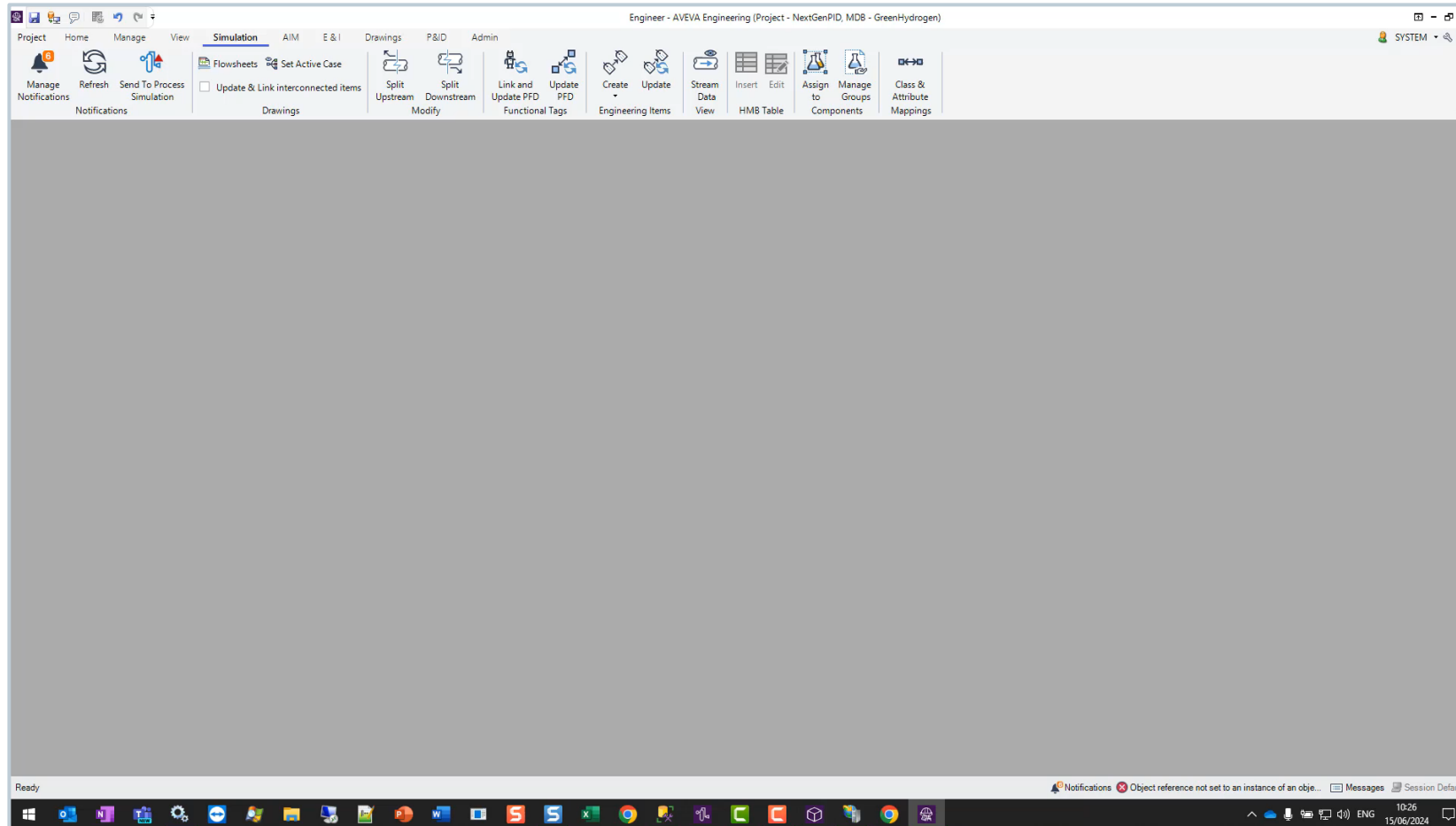
AVEVA™ Engineering

Import simulation case and update functional item on PFD



AVEVA™ Engineering

Define governing case



AVEVA™ Engineering

Update engineering items on P&ID

The screenshot displays the AVEVA Engineering software interface. The top menu bar includes 'Project', 'Home', 'Manage', 'View', 'Simulation', 'AIM', 'E & I', 'Drawings', 'P&ID', 'Admin', and 'Equipment'. The 'Simulation' tab is active, showing a toolbar with various tools like 'Flowsheets', 'Set Active Case', 'Update & Link interconnected items', 'Split Upstream', 'Split Downstream', 'Link and Update PFD', 'Update PFD', 'Create', 'Update', 'Stream Data', 'Insert', 'Edit', 'Assign to Components', 'Manage Groups', and 'Class & Attribute Mappings'. The 'Grids Explorer' on the left shows a tree view with folders for 'Admin Grids', 'Electrical', 'Elevate Grids', 'Instrumentation', 'Unified Engineering', '1-Simulation', '2-Functional' (containing 'FUN_HX', 'FUN_PUMP', and 'GreenH2 Functional'), '3-Engineering', '4-Summary', and 'User Grids'. The main workspace shows a table with the following data:

General				Specification					
Name of the element	Description of the element	Realized By	Specified By	CD Power [kW]	CD Power [kW]	CD Power [kW]	CD Speed [rpm]	CD Speed [rpm]	CD Speed [rpm]
P1		P1-A	P1	20.00	0.17	6.38	15.59	3600.00	3600.00

The status bar at the bottom indicates '1 record(s) selected' and 'FUN_PUMP' is the active item. The Windows taskbar at the bottom shows the system tray with the date '15/06/2024' and time '10:33'.

AVEVA™ Engineering

Duplicate feedwater pump

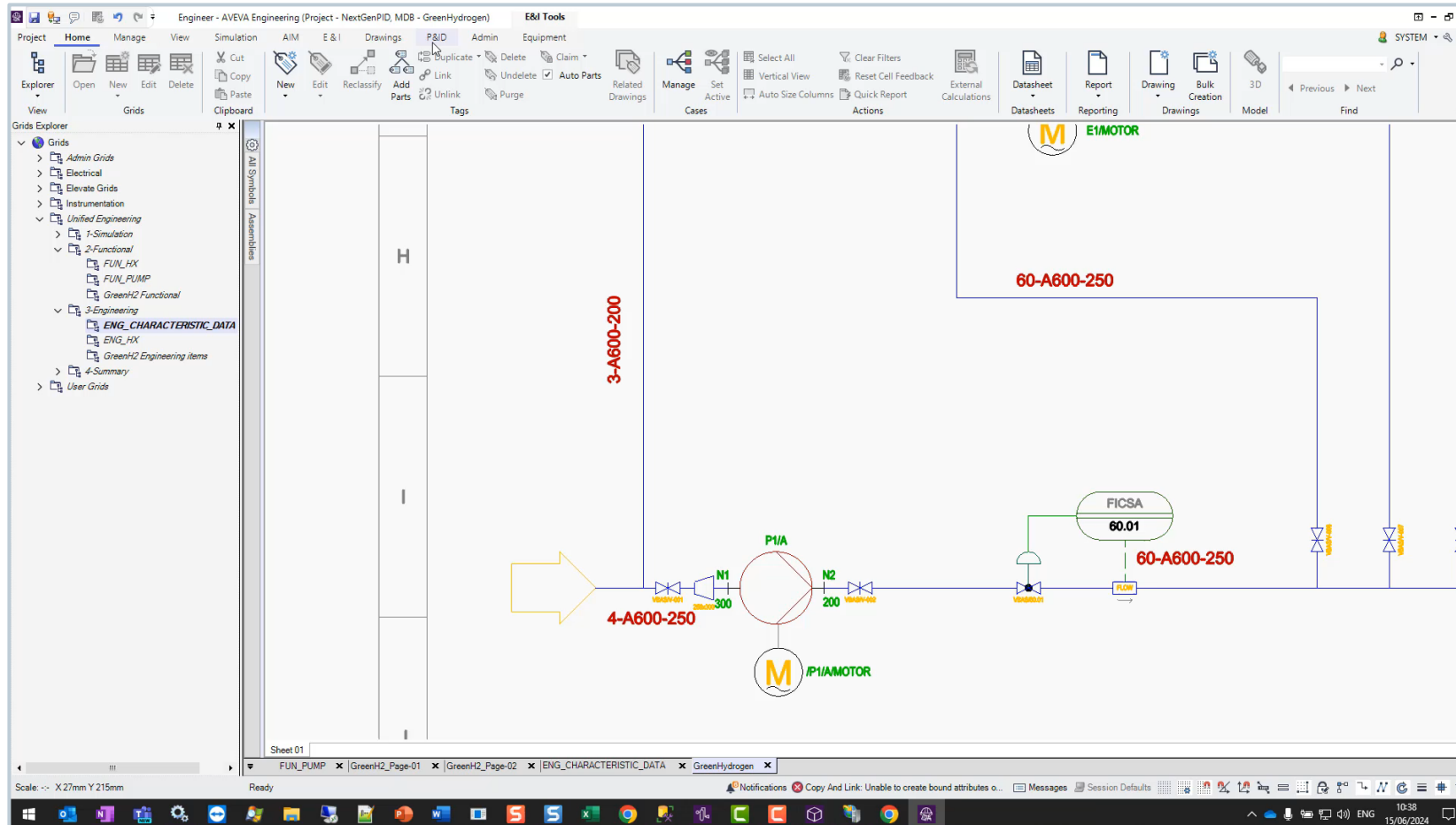
The screenshot displays the AVEVA Engineering software interface. The main window is divided into several panes:

- Grids Explorer:** A tree view on the left showing the project hierarchy, including 'Admin Grids', 'Electrical', 'Elevate Grids', 'Instrumentation', 'Unified Engineering', '1-Simulation', '2-Functional', '3-Engineering', and 'User Grids'.
- Table:** A data table with columns for 'Characteristic', 'Label', 'Desc', 'Value', and 'Uom'. The table is organized into three sections: 'Characteristic 2', 'Characteristic 3', and 'Characteristic 4'. The 'Characteristic 2' section includes rows for 'Area' and 'Differ... P'. The 'Characteristic 3' section includes rows for 'Area' and 'Differ... P'. The 'Characteristic 4' section includes rows for 'Area' and 'Differ... P'. The 'Differ... P' row in the 'Characteristic 2' section is highlighted in yellow.
- 2D Schematic:** A 2D diagram showing the piping and equipment layout, including a pump and various valves. The diagram is labeled 'Sheet 01'.
- 3D View:** A 3D perspective view of the feedwater pump and its associated piping, showing the physical structure and components.

The software interface includes a top menu bar with options like 'Project', 'Home', 'Manage', 'View', 'Simulation', 'AIM', 'E&I', 'Drawings', 'P&ID', 'Admin', and 'Actions'. The '3D Viewer' and 'E&I Tools' tabs are active. The status bar at the bottom shows 'Scale: -- X 63mm Y 162mm' and '1 record(s) selected'.

AVEVA™ Engineering

Update P&ID



AVEVA™ Engineering

Add labels to the equipment bar on P&ID

The screenshot displays the AVEVA Engineering software interface. The main window shows a P&ID drawing of a process system with two pumps (P1/B and P2/B) and associated piping. The equipment bar at the bottom of the drawing is highlighted. On the left, the P&ID Explorer shows the project structure, including the P&ID Explorer and Equipment folders. The right-hand pane displays the properties of the selected equipment, including the Asset, Basic definition, and four sets of CharacteristicData.

Asset	
SapIden#	
SerialNumber	
Type	
Vendor	

Basic definition	
Clone references	P1/A

CharacteristicData	
CharacteristicData.choiceArrangement	
CharacteristicData.heightHead	18000.00mm
CharacteristicData.power	20.00kW
CharacteristicData.speed	3600.00rpm
CharacteristicData.volumeFlowRate	300.00m3/h

CharacteristicData 1	
CharacteristicData1.Label	Speed
CharacteristicData1.ShortDescription	n
CharacteristicData1.UnitOfMeasure	hertz
CharacteristicData1.Value	3600.00

CharacteristicData 2	
CharacteristicData2.Label	Power
CharacteristicData2.ShortDescription	P
CharacteristicData2.UnitOfMeasure	kW
CharacteristicData2.Value	20

CharacteristicData 3	
CharacteristicData3.Label	Volume flow design
CharacteristicData3.ShortDescription	Q
CharacteristicData3.UnitOfMeasure	m3/s
CharacteristicData3.Value	300.00

CharacteristicData 4	
CharacteristicData4.Label	Differential head design
CharacteristicData4.ShortDescription	H
CharacteristicData4.UnitOfMeasure	m
CharacteristicData4.Value	18

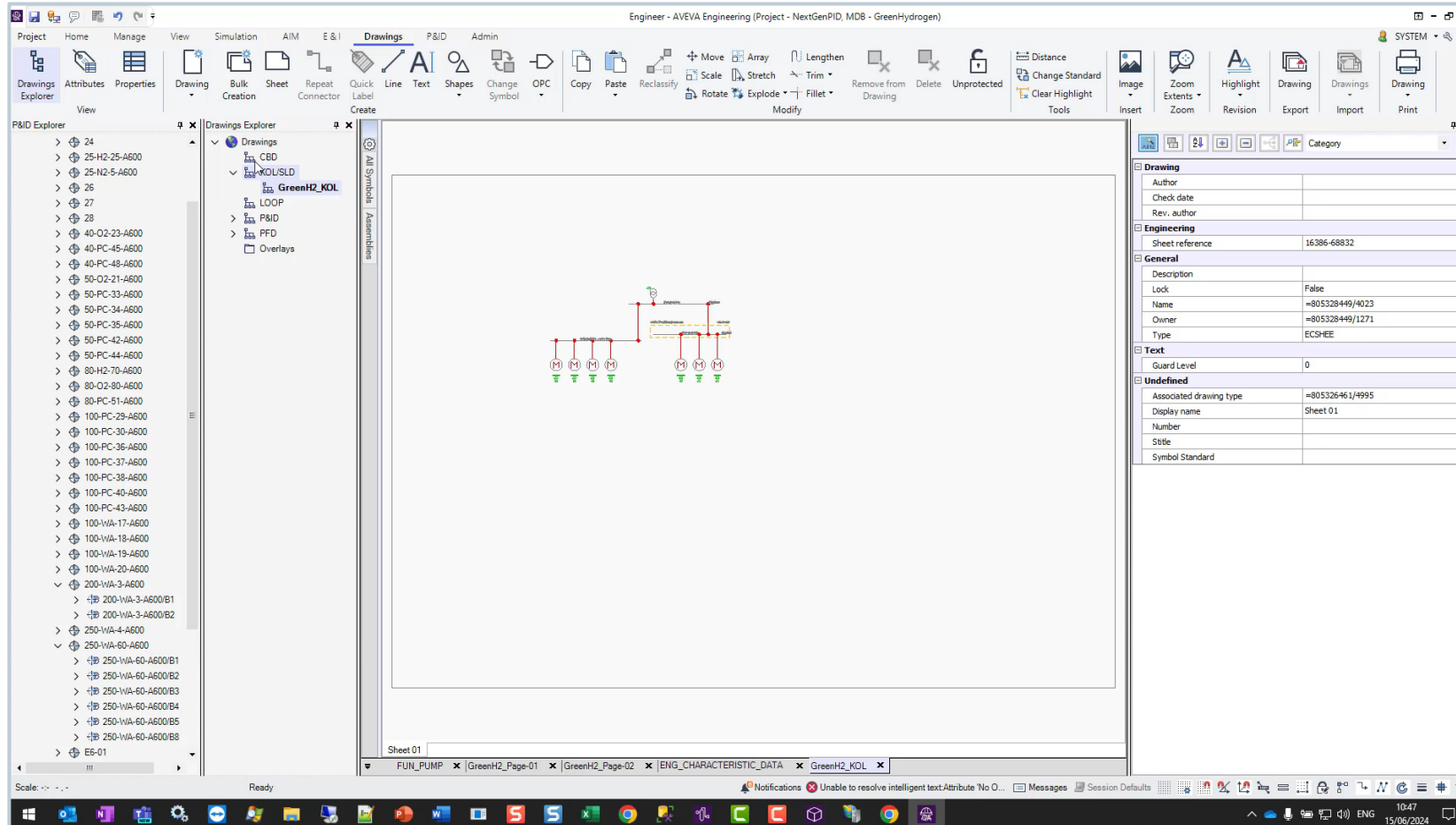
ENG	
manufacturer	

FEED	
FunEquRbEqui	

General	
Description	
Lock	False

AVEVA™ Engineering

Update KOL drawing



AVEVA™ Engineering

Create cable sizing and power cable

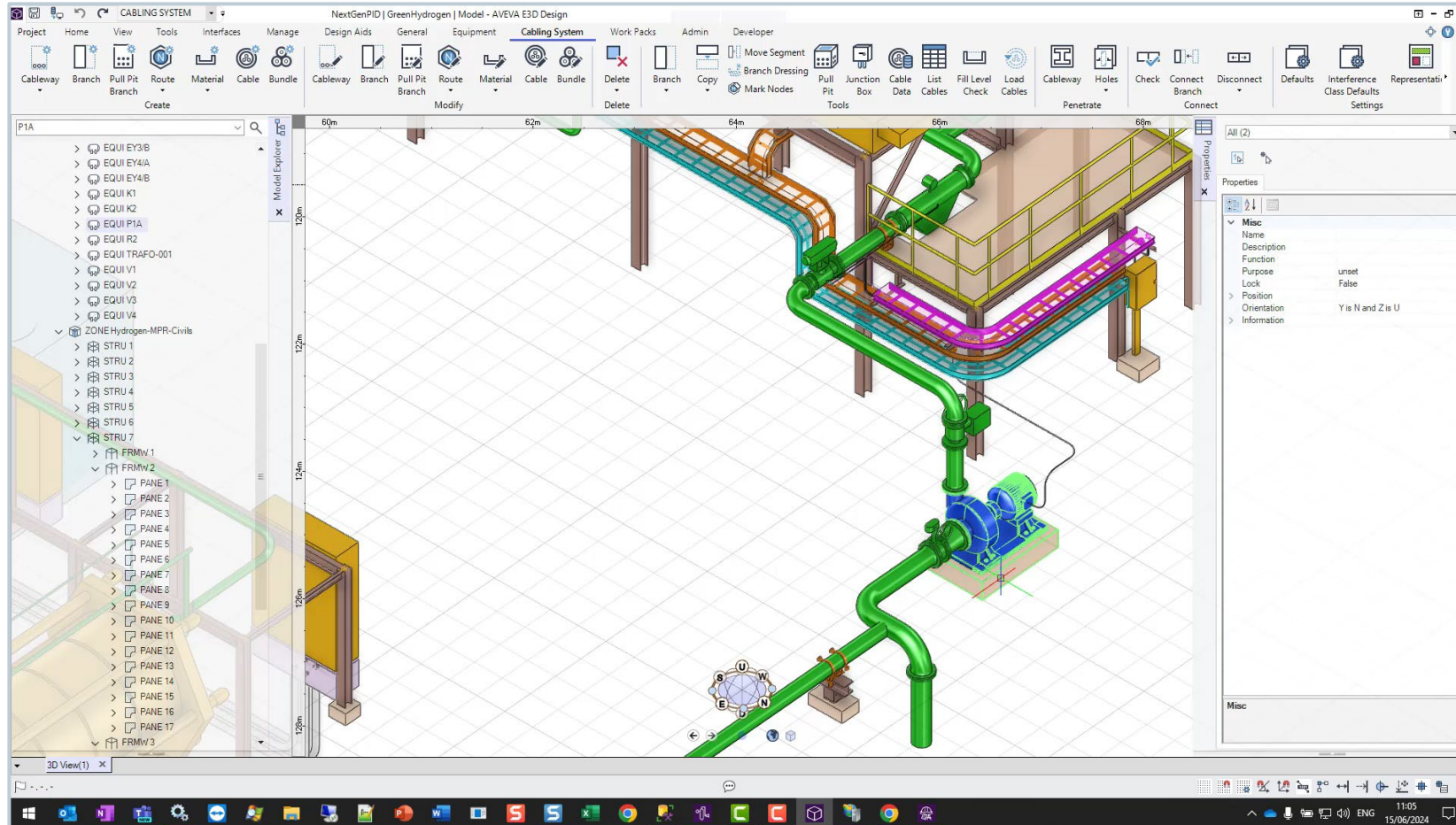
The screenshot displays the AVEVA Engineering software interface for a project titled "Engineer - AVEVA Engineering (Project - NextGenPID, MDB - GreenHydrogen)". The main workspace shows a power distribution diagram with three busbars: BUS: BUS-001 (415V, 50Hz), BUS: BUS-002, and BUS: BUS-004. BUS-001 is connected to three motors (E1, E2, E3). BUS-002 is connected to four motors (E4, E5, E6, E7). BUS-004 is connected to two motors (E8, E9). The diagram also shows a power source of 210.89kW and a cable labeled "415V, TN, 50Hz (Normal)".

The right-hand panel shows the properties for the selected motor, "P1/A/MOTOR". The properties are organized into several sections:

- Basic definition**
 - Clone references: P1/A/MOTOR
- E&I Part**
 - Equipment Plug
 - Equipment Sockets
 - Fed Item Connectors
 - Internal Connectors
 - Terminal Container Terminals: =805336641/4 =805336641/5 =805336...
- E&I Reference**
 - Connection Voltage: 415V, TN, 50Hz (Normal)
 - DC Connection Identifier
 - Output Voltages: 415V, TN, 50Hz (Normal)
 - Phase: Phase 123N (Normal)
 - Powered Equipment Carrying Potential: Phase 123N (Normal)
- E_List**
 - Absorbed Efficiency: 0.85Ratio
 - Absorbed Power Factor: 0.9
 - Nameplate Efficiency: 0.85Ratio
 - Nameplate Power: 12.00kW
 - Utilisation: Continuous
- Electrical**
 - Current Type
 - DC Negative
 - DC Positive
 - Diversity Factor: 1.00Ratio
 - Efficiency 100%
 - Efficiency 25%
 - Efficiency 50%
 - Efficiency 75%
 - Equipment Frequency: 50.00hertz
 - Equipment No Of Phases: 3
 - Equipment Project Voltage: 415.00volt
 - Include In Load Calculations
 - Include Power Consumed
 - Intermittent Current: 0.00ampere
 - Intermittent No Diversity Factor Con...: 0.00ampere
 - Intermittent No Diversity Factor Con...: 1
 - Intermittent No Diversity Factor Con...: 0.00Vareac
 - Intermittent Power Factor: 1

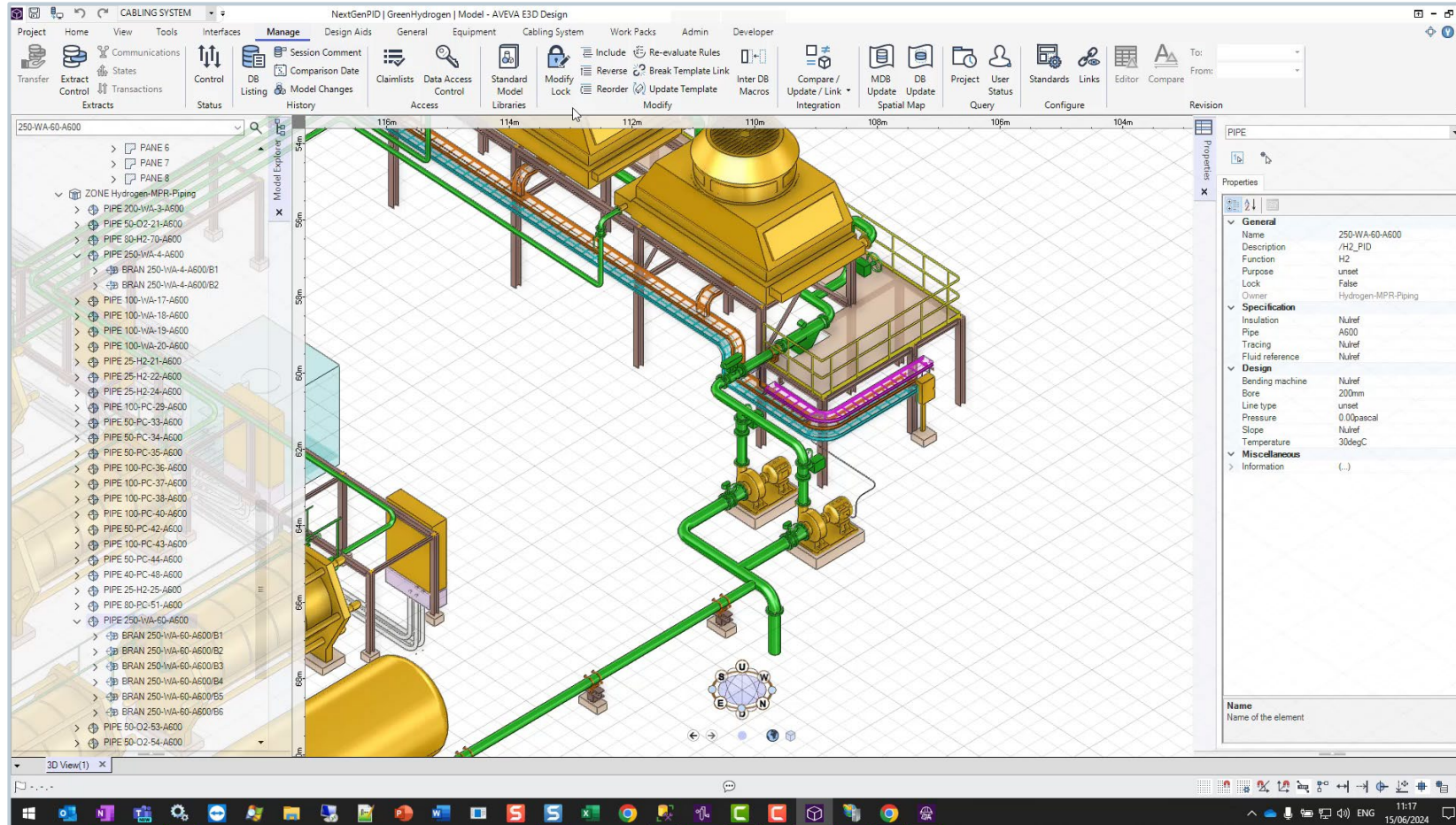
AVEVA™ E3D Design

Copy existing feedwater pump and modify connected piping



AVEVA™ E3D Design

Import cable by compare and update and route cable



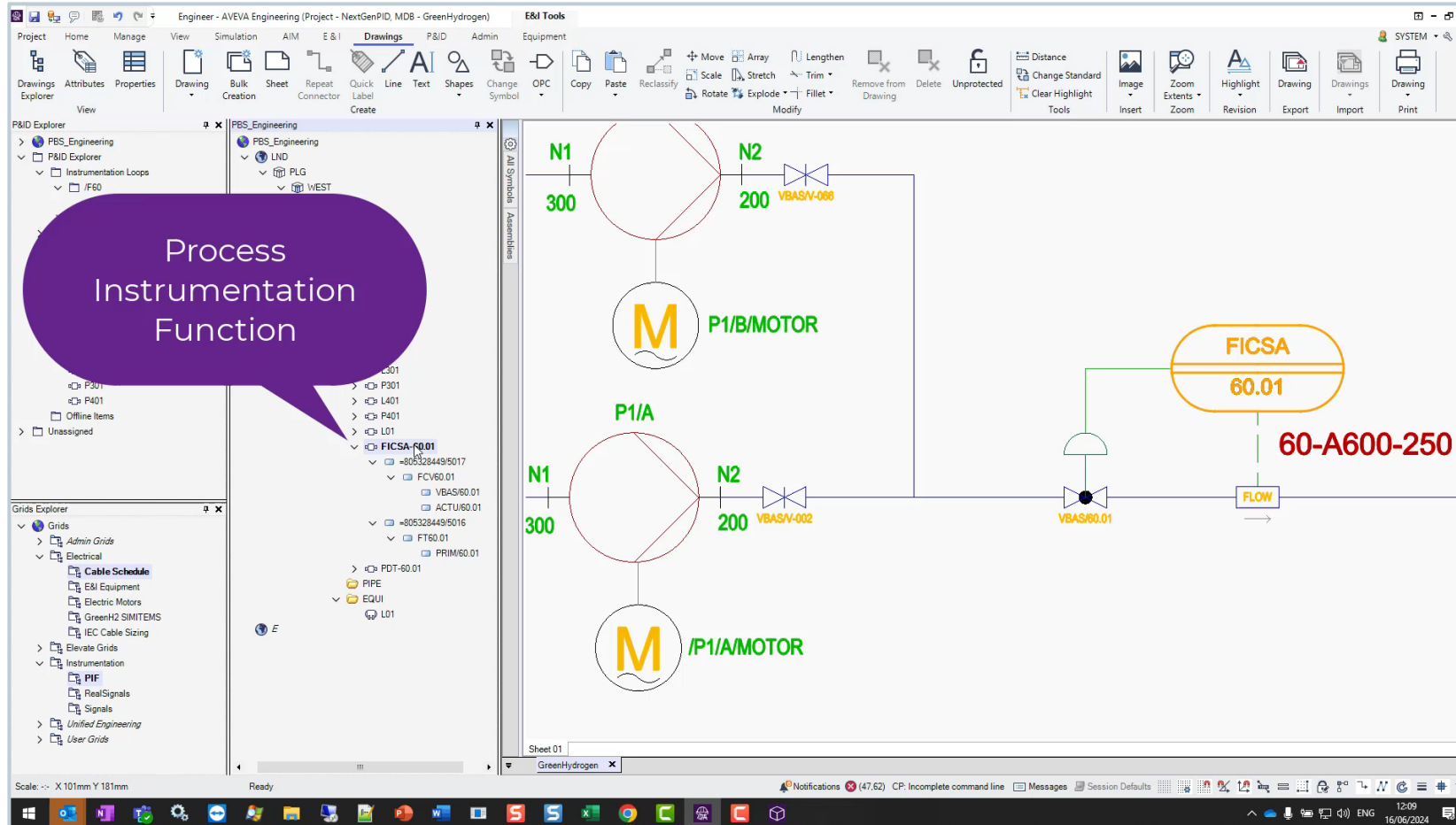
AVEVA™ Engineering

Import length by compare and update from AVEVA E3D Design

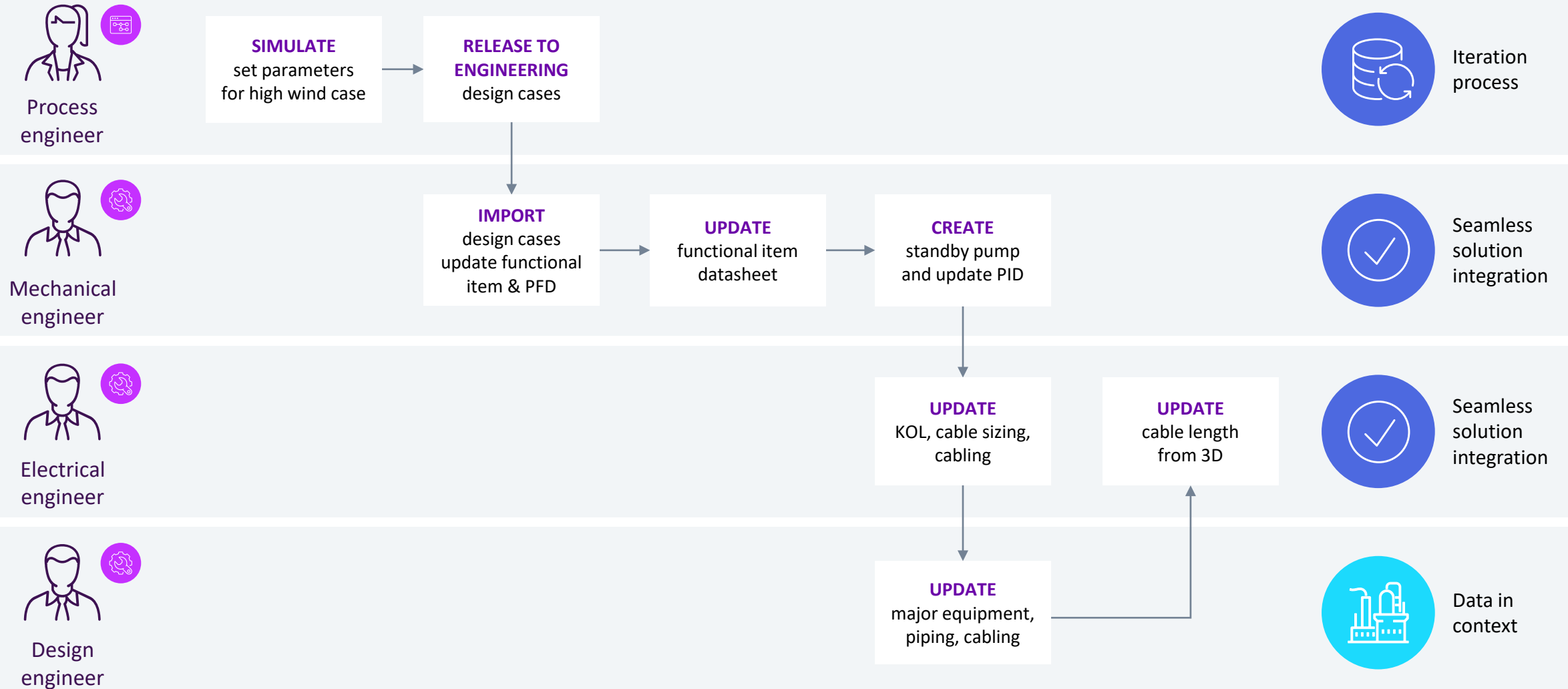


AVEVA™ Engineering

Review the flow control loop



AVEVA™ Unified Engineering 3.0



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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.

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