

EON Control Room

Premium simulation connected to field practice and actual work



Five customer advantages and the engineering specification
Team review package 27 September 2026

The product in everyday words

Control room

Practise running the operation from screens, alarms and controls.

Field team

Practise at the equipment, then use approved guidance during real work.

Emergency command

Practise coordinating people and resources when an incident grows.

One simulated operation. Each person sees the information relevant to their role.

A complete product with five customer advantages

The essential capability

Accurate simulation, familiar controls and dependable engineering tools.

The EON difference

AI creation, coordinated teams and a direct connection to actual work.

The commercial result

Less effort to create, update and own the accepted system.

The delivery obligation

Twenty benefits connect to 24 requirements, named owners and acceptance tests.

The mandate is comprehensive. Each released domain must pass its declared scope and performance gates.

EON Control Room competitive advantage

Five buying decisions make the 20 benefits easier to compare

Buying decision	Customer benefit	EON	AVEVA	Emerson	Honeywell	Yokogawa	Atmos	DNV	SynergyXR	Uptale
Simulation depth Trust the model and test operating decisions	Physics and operator simulation	Done+	✓	✓	✓	✓	✓	✓	—	—
	Engineering studies and control checkout	Done	✓	✓	✓	✓	—	—	—	—
	Reuse of 3D assets or component libraries	Done	—	✓	—	—	—	—	✓	✓
	Online process models for operations	Done	—	—	✓	✓	—	—	—	—
	No-code interactive 3D authoring	Done	—	—	—	—	—	—	✓	✓
AI creation Build equipment and procedures with less work	AI-assisted training creation	Done	—	—	—	—	—	—	✓	✓
	Documents to interactive training	Done	—	—	—	—	—	—	—	Beta
	AI equipment twins from photos or P&IDs	Done	—	—	—	—	—	—	—	—
	AI internal equipment knowledge	Done	—	—	—	—	—	—	—	—
	AI procedures linked to validated models	Done	—	—	—	—	—	—	—	—
Team rehearsal Operators, field and command practise together	Field and control-room joint exercises	Done	✓	✓	✓	✓	—	—	—	—
	Command joins the field and operators	Done	—	—	—	—	—	—	—	—
	Shared replay of roles and process state	Done	—	—	—	—	—	—	—	—
Connected work Approved guidance and lessons reach the real job	AR guidance at real equipment	Done	✓	—	—	—	—	—	—	—
	Rehearsal linked to permits and evidence	Done	—	—	—	—	—	—	—	—
	Work evidence improves approved training	Done	—	—	—	—	—	—	—	—
Speed and cost Less effort to create, update and own	10-minute playable procedure draft	Done	—	—	—	—	—	—	—	—
	80% fewer approved authoring hours	Done	—	—	—	—	—	—	—	—
	90% fewer content update hours	Done	—	—	—	—	—	—	—	—
	60% lower five-year ownership cost	Done	—	—	—	—	—	—	—	—

✓ Vendor documented — Not verified, not absent Beta = vendor beta Product scope and sources in notes

EON “Done” assumes completed delivery and validation. Done+ adds tighter accuracy. Savings require matched tests.

10-minute draft scope: 10 steps, prepared equipment and complete inputs. Customer use follows acceptance.

Simulation depth

Trust the model and test operating decisions

Customer benefit	EON	AVEVA	Emerson	Honeywell	Yokogawa	Atmos	DNV	SynergyXR	Uptale
Physics and operator simulation	Done+	✓	✓	✓	✓	✓	✓	—	—
Engineering studies and control checkout	Done	✓	✓	✓	✓	—	—	—	—
Reuse of 3D assets or component libraries	Done	—	✓	—	—	—	—	✓	✓
Online process models for operations	Done	—	—	✓	✓	—	—	—	—

Why this matters

Familiar controls and credible process behavior give the team a dependable place to practise, test changes and investigate operating choices.

Example in the customer’s operation

An engineer tests a revised pump sequence in a study copy. The controller then rehearses it through familiar screens before the approved change reaches the site.

Done+ adds a premium accuracy offer against agreed reference cases.

✓ Vendor documented — Not verified, not absent Beta = vendor beta Product scope and sources in notes

EON “Done” is the completed-release scenario. Delivery, accuracy and savings require acceptance evidence.

AI creation

Build equipment and procedures with less manual work

Customer benefit	EON	AVEVA	Emerson	Honeywell	Yokogawa	Atmos	DNV	SynergyXR	Uptale
No-code interactive 3D authoring	Done	—	—	—	—	—	—	✓	✓
AI-assisted training creation	Done	—	—	—	—	—	—	✓	✓
Documents to interactive training	Done	—	—	—	—	—	—	—	Beta
AI equipment twins from photos or P&IDs	Done	—	—	—	—	—	—	—	—
AI internal equipment knowledge	Done	—	—	—	—	—	—	—	—
AI procedures linked to validated models	Done	—	—	—	—	—	—	—	—

Why this matters

Authors start with equipment information and approved procedures. AI helps turn those inputs into an interactive exercise that specialists can review and release.

The advantage is less total work through approval, including corrections.

✓ Vendor documented — Not verified, not absent Beta = vendor beta Product scope and sources in notes

EON “Done” is the completed-release scenario. Delivery, accuracy and savings require acceptance evidence.

Example in the customer’s operation

An author supplies an approved valve procedure and equipment data. The system drafts the field steps, connects actions to the right simulated component and prepares an assessment.

Team and emergency rehearsal

Operators, field teams and command practise together

Customer benefit	EON	AVEVA	Emerson	Honeywell	Yokogawa	Atmos	DNV	SynergyXR	Uptale
Field and control-room joint exercises	Done	✓	✓	✓	✓	—	—	—	—
Command joins the field and operators	Done	—	—	—	—	—	—	—	—
Shared replay of roles and process state	Done	—	—	—	—	—	—	—	—

Why this matters

Each person practises their own responsibility while seeing how their decisions affect the whole operation. One replay exposes missed information and weak handoffs.

Example in the customer’s operation

A pressure alarm triggers a field check. A delayed report changes the command team’s coordination decisions. The debrief reconstructs every role’s information and the simulated process response.

Emergency Command rehearses coordination on simulated equipment.

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EON “Done” is the completed-release scenario. Delivery, accuracy and savings require acceptance evidence.

Connected work

Carry approved guidance and lessons into the real job

Customer benefit	EON	AVEVA	Emerson	Honeywell	Yokogawa	Atmos	DNV	SynergyXR	Uptale
AR guidance at real equipment	Done	✓	—	—	—	—	—	—	—
Rehearsal linked to permits and evidence	Done	—	—	—	—	—	—	—	—
Work evidence improves approved training	Done	—	—	—	—	—	—	—	—

Why this matters

Training stays connected to the procedure people actually use. Reviewed job evidence improves the next exercise and the next approved work instruction.

Example in the customer’s operation

During a maintenance handover, a technician records a mismatch. A reviewer corrects the approved procedure, checks the affected simulation and publishes the update to training and work.

Practice and real work share approved knowledge under separate authority.

✓ Vendor documented — Not verified, not absent Beta = vendor beta Product scope and sources in notes

EON “Done” is the completed-release scenario. Delivery, accuracy and savings require acceptance evidence.

Speed and cost

Reduce the effort to create, update and own the system

Customer benefit	EON	AVEVA	Emerson	Honeywell	Yokogawa	Atmos	DNV	SynergyXR	Uptale
10-minute playable procedure draft	Done	—	—	—	—	—	—	—	—
80% fewer approved authoring hours	Done	—	—	—	—	—	—	—	—
90% fewer content update hours	Done	—	—	—	—	—	—	—	—
60% lower five-year ownership cost	Done	—	—	—	—	—	—	—	—

Why this matters

Customers can afford to train more procedures and keep them current. The commercial test includes the complete accepted system and the effort required to maintain it.

Example in the customer’s operation

A revised SOP updates the affected role views and tests. Specialists review the change once before release, and the cost record includes every correction and approval hour.

10-minute draft scope: 10 steps, prepared equipment and complete inputs.

✓ Vendor documented — Not verified, not absent Beta = vendor beta Product scope and sources in notes

EON “Done” is the completed-release scenario. Delivery, accuracy and savings require acceptance evidence.

The problem is the handoff

The screen

A controller sees a signal but may not know what the equipment looks like.

The equipment

A technician sees the local condition but may not know the whole process.

The response

A coordinator needs both views to decide who should act next.

The training target includes communication, uncertainty and verification.

The product family

Offering	Who uses it	What they practise
EON Control Room	Operators and instructors	Process operation, alarms and abnormal events
Connected field training	Technicians and supervisors	Equipment procedures with Genesis and EON Live
EON Emergency Command Simulator	Incident and response teams	Coordination through Situation Room
Work Intelligence connection	Workers and assessors	Approved guidance, evidence and reviewed learning

EON Control remains the portfolio workspace. EON Control Room is the simulator product.

A suspected pipeline leak

1 Notice

The operator sees an unexpected pressure pattern.

2 Check

The field trainee reports a local observation and its uncertainty.

3 Coordinate

The response team assigns tasks under the approved incident plan.

4 Learn

The whole team replays the decisions and process consequences.

Illustrative exercise. Site engineers define the approved response.

Ordinary work also needs rehearsal

Use case	Connection to practise	What the debrief checks
Restart after maintenance	Field readiness and operator authorization	Correct handover, evidence and sequence
Product changeover	Control schedule and field line-up	Correct destination and acknowledged changes
Pump changeover	Local equipment state and control response	Role coordination and process stability
Communication failure	Missing telemetry and local reports	Stale information and escalation

Emergency command explained

Control room

Operates the equipment and responds to process alarms.

Incident command

Directs the response at the incident under the organization's plan.

Emergency center

Coordinates information, resources and wider support.

A practice center can use screens and realistic consoles connected to a simulator.

A simple way to create an exercise

1 Describe

Choose the site, equipment, procedure and learning goal.

2 Generate

Genesis prepares a draft using approved source material and reusable assets.

3 Review

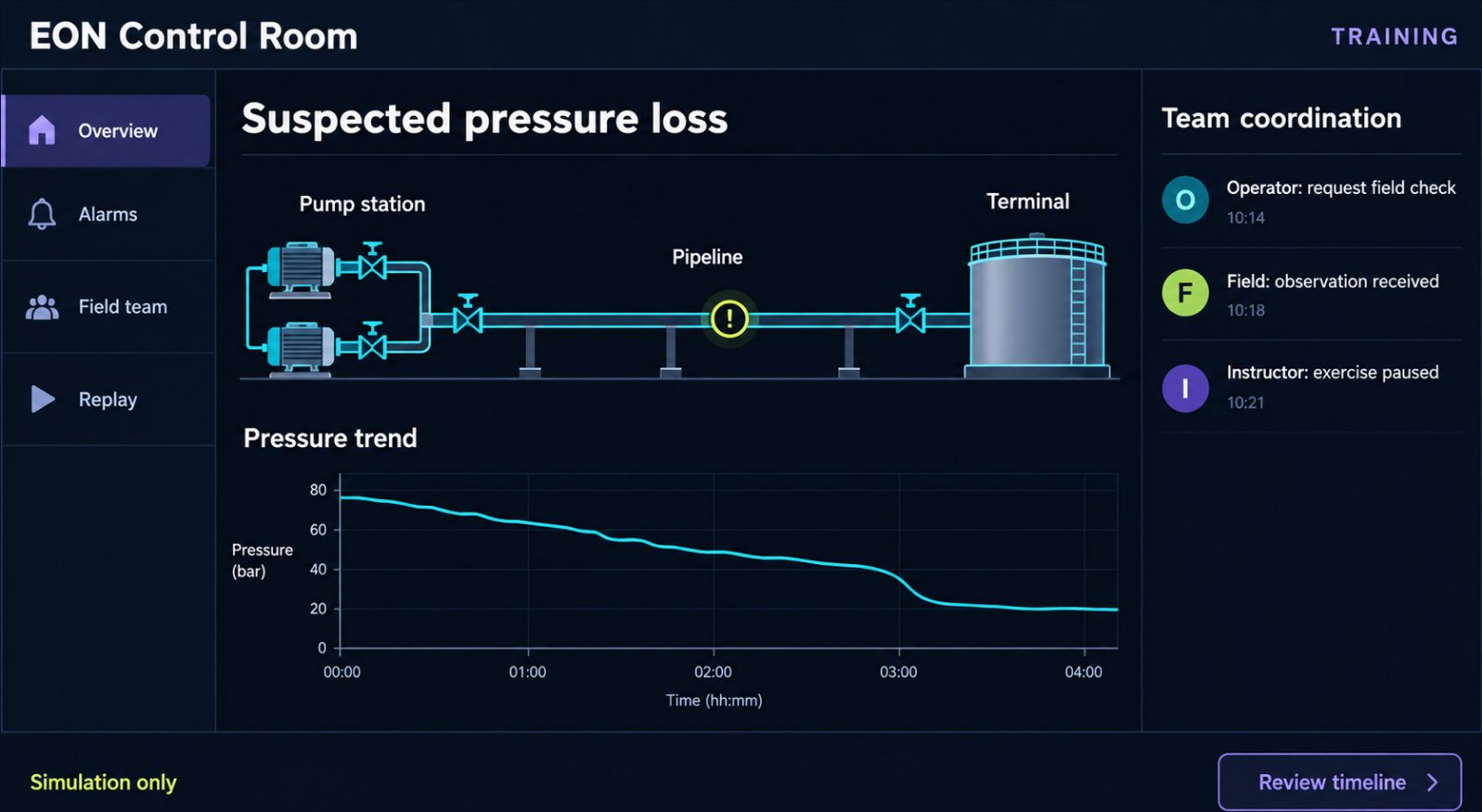
The specialist checks behavior, hazards, roles and missing information.

4 Practise

Release a version and invite the team into the same exercise.

The goal is a short authoring journey with visible engineering checks.

The control-room experience



Proposed interface concept. BPCL trainee screens would reproduce its approved SCADA conventions.

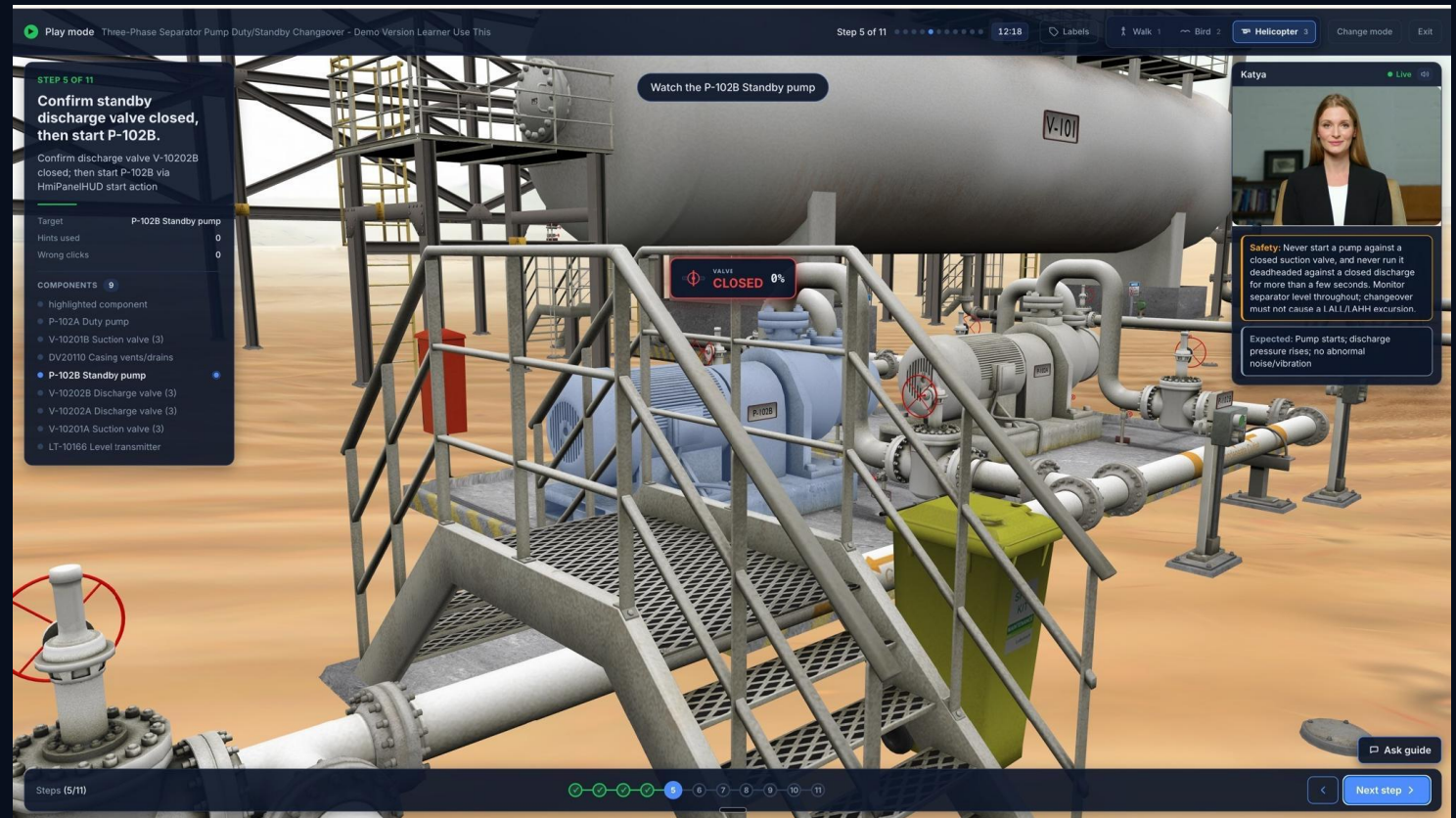
Immersive practice at the equipment

Genesis

A learner explores equipment and follows a procedure in the scene.

Control Room extension

The operator's actions and the field learner's actions affect one session.



Supplied Genesis demonstration image from EON v20, page 7.

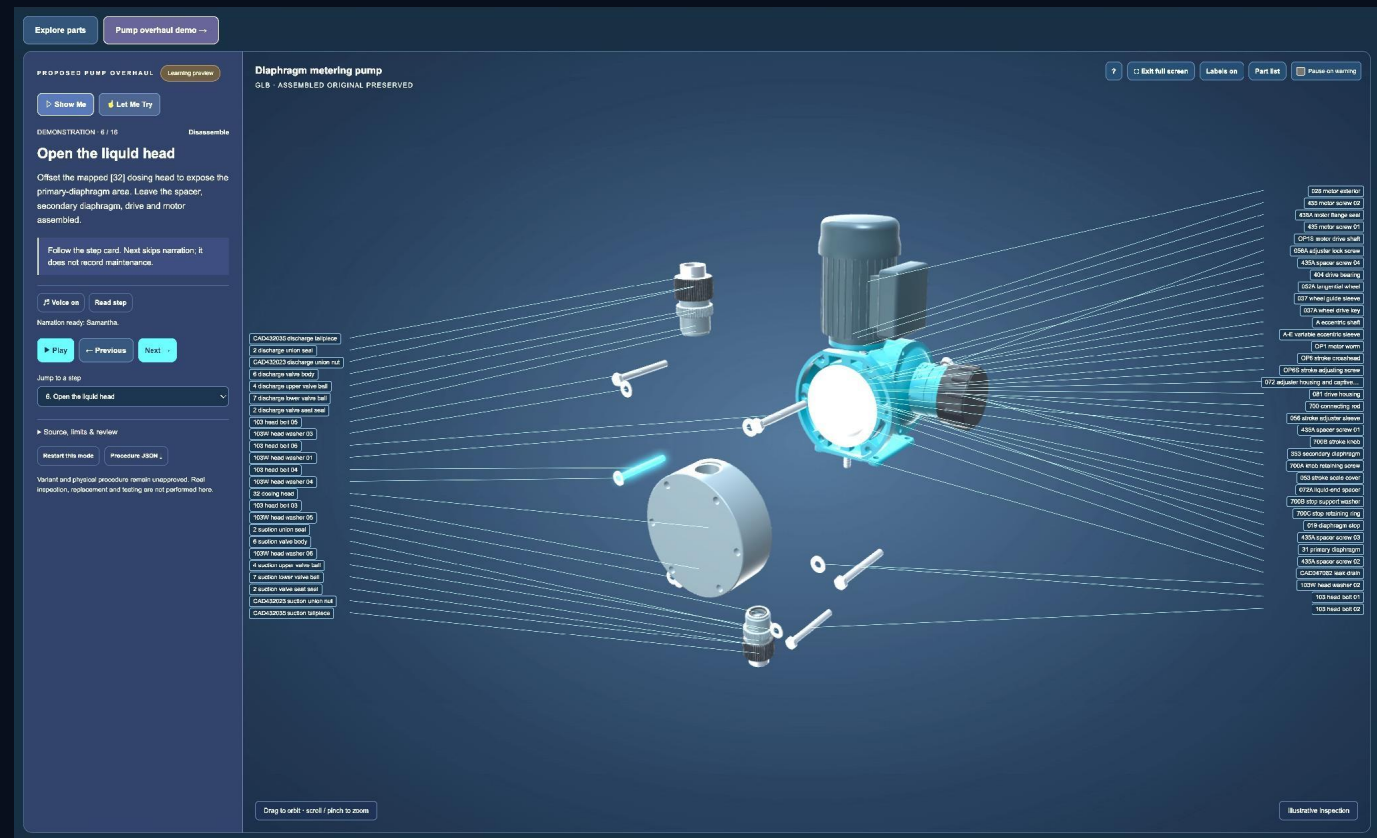
Equipment knowledge goes beyond a panorama

Model Inside

Inspect internal parts and see how they fit together.

Simulation extension

Connect relevant parts to
procedure rules and
validated behavior.



Supplied Model Inside engineering prototype image from EON v20, page 15.

Real work completes the learning loop

Field IQ

Guidance and evidence at the equipment during the real job.

Reviewed learning

A qualified person approves lessons before they update future training.



Illustration supplied in EON v20, page 27. Proposed integration extends the work loop.

The EON products behind the experience

EON products	Customer benefit	Control Room connection
Universal and Model Inside	Equipment identity, geometry and internal parts	Bind assets to process tags and model parameters
Genesis and XR Infinite	Authoring and immersive learning	Generate coordinated, role-specific exercises
EON Live and Situation Room	Behavior and incident rehearsal	Shared simulation runtime and command roles
Field IQ, Assess IQ and Work Intelligence	Work evidence and learning	Versioned feedback, team scoring and replay

Future-release product view. The technical section defines the integration and validation work.

EON has built connected simulation before

2013

A gas-processing facility simulator was already operating.

2015

ExxonMobil named EON Reality as co-developer and granted a global commercial license.

Now

The proposed product applies EON's current authoring and work tools to this established domain.

Historical delivery establishes relevant experience. New product performance needs its own evidence.

The right kind of XR for each task

Representation	Useful for	Additional requirement
360° photography	Site orientation and visual hazard recognition	Interaction rules for procedural practice
Interactive 3D	Equipment actions and assembly relationships	Behavior models for physical consequences
Process simulation	Pressure, flow and control response	Calibrated parameters and validated numerics
AR work guidance	Instructions on real equipment	Asset confirmation and approved work authority

EON's own Worlds Module supports 360°, video and 3D. Modality follows the learning task.

The cost advantage has three clocks

First playable draft

Time to generate a scene and a usable first exercise.

Approved procedure

Time including specialist review, corrections and evidence.

Accepted site simulator

Time including calibration, integration and customer testing.

Target the complete approved result. V20 cost claims are a separate evidence basis from the new TCO target.

The Bharat Petroleum application

Two pipelines

Mumbai–Manmad
252 km

Bina–Kota
260 km

Training center

Five independent
trainees

One instructor
One engineering station

Delivery context

Jobner installation

50 SCADA screens

Operation without
internet

Requirement summary from the local BPCL bid drafts. Buyer documents remain the contractual authority.

How the product would fulfill BPCCL's need

EON Control Room

Reproduces the operator screens and instructor training functions.

EON Live extension

Provides validated pipeline behavior, equipment and control logic.

EON training foundation

Adds authoring, guided practice, assessment and evidence records.

Connected extensions

Uses Genesis for immersive field roles and Situation Room for command rehearsal.

The base tender emulates field actions through the instructor. Immersive roles and command are additions.

A BPCL lesson and a richer team exercise

Required training baseline

The trainee operates a pipeline.

The instructor introduces a pump trip and performs simulated field actions.

The system records response and scores the agreed objectives.

Connected product extension

A field trainee joins through Genesis.

Emergency roles join through Situation Room.

The debrief shows process response alongside team decisions.

The enhanced exercise must preserve independent sessions and the accepted training baseline.

PART TWO

The product and delivery design

A complete simulation stack, 24 leadership requirements and BPCL acceptance

How leadership becomes an engineering plan

Capability floor

No missing mandatory feature and no material regression on the agreed case set.

Winning target

A measurable improvement in each buying dimension where improvement is meaningful.

Traceable build

Existing EON foundations plus a named extension, accountable owner and release gate.

Comparable proof

Match inputs, hardware, fidelity and support before comparing results.

A visually impressive demonstration does not compensate for a failed process or controls test.

The targets for a decisive commercial advantage

Measure	Proposed target	Conditions that keep the comparison fair
T1 Creation	10-minute draft; 80% fewer approved hours	Pre-bound ten-step procedure; include specialist review
T2 Updates	90% fewer end-to-end update hours	Include impact analysis, regression and approval
T3 Integration	70% less repeat-integration effort	Same supported profile and comparable tag volume
T4 Five-year TCO	60% lower total ownership cost	Equal fidelity, functions, scale and support

Proposed design targets, not measured results. Equal scope, quality and benchmark rules apply.

The targets for a stronger simulation product

Measure	Proposed stretch target	Required engineering discipline
T5 Physics	1% / 5% / 2.5% error limits	Half the draft BPCL limits, subject to reference quality
T6 Team learning	30% fewer critical handoff errors	Matched scenarios and independent assessment
T7 Performance	10x speed; ≤ 250 ms command acknowledgement	Declare hardware, workload and simulation lag
T8 Engineering	50% shorter engineering cycles	Include review; no increase in escaped defects

Proposed design targets, not measured results. Equal scope, quality and benchmark rules apply.

The expansion of EON Live

Layer	Existing foundation	Extension to engineer
Equipment behavior	EON Live behavior on a twin, described in v20	Parameter contracts and validated domain models
Process network	Equipment and asset context across EON	Pipeline topology, boundaries and numerical solver
Simulation runtime	Interactive training applications	Independent sessions, clocks, snapshots and restore
Integration	Prior EON process-simulation experience	SCADA, Genesis and command adapters with one event history

The compressor demonstration does not establish long-distance liquid-pipeline accuracy.

The expanded simulation architecture

Asset and knowledge layer

Universal, Model Inside and Tacit bind equipment, procedure and expert knowledge.

Deterministic runtime

Physics, controls, scenario execution and ordered events share one session clock.

Role experiences

Control Room, Genesis and Situation Room render the right view of that session.

Work and improvement

Field IQ and Assess IQ feed reviewed changes into versioned releases.

AI assists creation and explanation. Released models determine the simulated physical response.

Astra-assisted engineering at product scale

Implement

Draft kernels, controls, adapters, migration tools and scenario compilers.

Verify

Generate property tests, failure cases, regression harnesses and performance profiles.

Review

Engineers inspect code and compare results against independent references.

Release

Version code, models, assets and evidence as one reproducible package.

L12 targets 50% shorter engineering cycles at equal quality. AI capability is not acceptance evidence.

A physics program designed for leadership

Work package	Implementation	Proof before release
Numerical core	Network equations, boundaries and stable integration	Conservation, analytical tests and convergence
Equipment models	Curves, valve dynamics, transport and abnormal states	Component and coupled-system regression cases
Model quality	Parameter calibration, uncertainty and validity limits	Held-out events and incumbent comparison
Optimization	Profile, parallelize and cache safe computations	Same accepted error bounds at greater speed

Native development and licensed solvers are valid routes. The customer outcome determines the selection.

Broader engineering and operating capability

Capability	Required extension	Customer outcome
Engineering studies	Branched models, sweeps and comparison reports	Test operating changes before adoption
Control checkout	Virtual controllers and contract-tested adapters	Find control defects before commissioning
Operating context	Read-only historian and telemetry inputs	Rehearse from real conditions and inspect drift
Model portability	Published interfaces and agreed exports	Retain customer knowledge and reduce lock-in

L04, L18, L19 and L23 extend the product beyond a training-only purchase.

Emergency command as a full product package

Command workspace

Incident board, map, role assignments, resource requests and communications.

Exercise control

Timed injects, missing information, escalation and simulated response delays.

Connected consequences

Field reports and command decisions join the selected process session.

Measured learning

Review decision quality, coordination time and adherence to the approved plan.

L14 supports separate command exercises and combined room-to-field rehearsal.

One authoritative simulation state

Model services

Compute pressure, flow, temperature and equipment state.

Control services

Apply interlocks, controller logic, trips and command authority.

Session coordinator

Orders accepted actions and advances a common simulation clock.

Role clients

Show the control room, field world, command view and instructor tools.

Every view reads the same session. The server determines accepted state changes.

Shared identifiers and the event contract

Object	Required fields	Why it matters
Asset	Site, tag, component class, geometry link	The same valve appears in every product
Command	Session, actor, role, asset, request ID, expected revision	Authority, deduplication and stale-command rejection
Event	Simulation time, sequence, cause, value, unit, quality	Ordered consequences and understandable replay
Release	Procedure, model, logic, scene and rubric versions	A repeatable exercise with traceable evidence

Proposed integration schema. Event timestamps alone do not establish causal order.

Simulation adapters and external models

Lifecycle

Initialize, run, pause, step, change speed, snapshot, restore and stop.

Capabilities

Declare supported physics, variables, units, state capture and determinism.

Standards

Use FMI where supported and OPC interfaces for agreed tag exchange.

Fallback

Integrate a proven licensed solver if native models miss the acceptance gate.

Tag exchange alone does not provide complete simulation lifecycle control.

Pipeline physics needs specialist engineering

Behavior	Model requirement	Verification approach
Pressure and flow	Liquid continuity, momentum, friction and elevation	Analytical cases and independent reference runs
Fast transients	Wave propagation, pump trips and valve closure	Time-step convergence and pressure envelopes
Slack line and vapor	Appropriate column-separation treatment	Known cases across the valid operating range
Products and additives	Batches, thermal properties, pigs and DRA	Transport balance and held-out operating events

The method of characteristics is a candidate for liquid transients. Method choice alone proves no accuracy.

Control-room fidelity

Function	BPCL adaptation	Acceptance evidence
SCADA screens	50 screens using approved colors, faceplates and tags	Operator review and screen-by-screen tests
Control logic	PID, local/remote modes, permissives and interlocks	Cause-and-effect test register
Safety response	Trips, ESD, voting, bypass timing and reset rules	Approved logic tests including failed instruments
Alarms and trends	Quality, timestamps, acknowledgement and history	Sequence-of-events and replay comparison

EON’s prior simulation delivery is the foundation. BPCL conventions and logic require exact mapping.

Instructor and trainee functions

Capability	Required behavior	Test case
Independent sessions	Different scenarios, faults and speeds per trainee	Five sessions run without state leakage
Time control	Freeze, resume and 0.1x to 5x speed	All services respect the selected simulation clock
Scenario control	Initial conditions, faults and branching	Repeat the same scenario from the same release
Self-training	Assignment, guidance, scoring and stored results	Trainee completes an exercise without instructor help

Existing EON authoring and assessment provide reusable foundations for these runtime features.

Scenario generation and release

1 Ingest

Parse the SOP, P&ID, tag list and equipment evidence with source references.

2 Bind

Match steps to assets, states, role permissions and model capabilities.

3 Check

Test branching, missing data, units, hazards and assessment evidence.

4 Release

A specialist approves an immutable package for rehearsal or work guidance.

AI drafts the scenario. Approved sources and validated components determine what can run.

Replay that explains what happened

Capture

Record process state, logic state, tasks, messages and instructor changes.

Restore

Recover the model, control system, clock and random seeds together.

Replay

Show what each role knew when the decision occurred.

Compare

Score actions against the approved rubric and retain assessor review.

Observed evidence supports assessment. Missing evidence remains visible.

Offline deployment for BPCL

Local runtime	Host models, assets, identity, reports and instructor functions on the training LAN.
Packaged AI	Run approved local inference where feasible or use pre-generated content.
Controlled updates	Import signed packages and updates through the approved maintenance process.
Isolation	Keep simulation commands away from live process controls.

A cloud demo or an OCI deployment does not establish offline BPCL compatibility.

Work Intelligence with governed learning

Customer evidence

Keep site procedures, worker records and operational data in the customer boundary.

Reviewed changes

A qualified owner approves changes to procedures and scenario releases.

General knowledge

Share permitted engineering lessons only under explicit governance and agreement.

Operational mode

Use approved job guidance with its own permissions and audit history.

V20's governance rule applies to the combined product and the Distillery.

Specification for simulation depth

Requirement	Required outcome	Owner and stage
L01 Physics fidelity	Validated accuracy plus automatic regression evidence	Simulation lead P1
L02 Equipment and domains	One component binds physics, geometry and procedure	Domain library lead P1 / P3
L03 Controls and SCADA	Exact controls plus assisted mapping and change tests	Controls lead P1
L04 Engineering studies	One model across study, rehearsal and work context	Engineering tools lead P2
L18 Operational decision support	Read-only operating context feeds rehearsal and field explanation	Operations integration lead P3

Detailed requirements and acceptance tests are preserved in the notes and white paper.

Specification for AI creation

Requirement	Required outcome	Owner and stage
L09 Scenario creation	SOP to a bound exercise with visible source evidence	Genesis authoring lead P2
L10 Asset creation and reuse	Reuse the equipment meaning as well as its appearance	Asset pipeline lead P2
L12 AI engineering	Astra-assisted implementation with independent verification	Engineering director P1 onward
L13 Field realism	Internal equipment knowledge tied to real consequences	XR and behavior lead P2
L15 Access and localization	One released procedure across devices and languages	Experience lead P2
L16 Usability and collaboration	One launch flow with role-specific views and shared review	Product design lead P2

Detailed requirements and acceptance tests are preserved in the notes and white paper.

Specification for team and emergency rehearsal

Requirement	Required outcome	Owner and stage
L05 Instructor control	Generate faults and branches from approved objectives	Training runtime lead P1
L06 Replay and recovery	Causal replay of process, field and command decisions	Distributed systems lead P1
L07 Team learning	Operator, field and command roles share one event history	Learning science lead P2
L08 Assessment and coaching	Evidence-linked coaching across work and simulation	Assessment lead P1 / P2
L14 Emergency command	Command tasks and resource decisions join the process exercise	Emergency exercise lead P2

Detailed requirements and acceptance tests are preserved in the notes and white paper.

Specification for connected work

Requirement	Required outcome	Owner and stage
L11 Procedure changes	One approved change updates every affected experience	Release platform lead P2
L17 Guidance during work	The approved training procedure becomes job guidance	Field IQ lead P2
L19 Enterprise interfaces	Reusable adapters with automated contract tests	Integration lead P1 / P2
L20 Knowledge improvement	Reviewed field lessons regenerate future practice	Knowledge governance lead P2

Detailed requirements and acceptance tests are preserved in the notes and white paper.

Specification for speed and cost

Requirement	Required outcome	Owner and stage
L21 Runtime performance	Elastic sessions with bounded latency and visible model quality	Runtime performance lead P1 / P3
L22 Deployment and resilience	The same released exercise works on isolated LAN or cloud	Platform and security lead P1 / P2
L23 Ownership and support	Customer portability plus repeatable local delivery	Delivery and service lead P1 onward
L24 Total ownership cost	AI creation and reuse reduce full lifecycle cost	Product and commercial lead P2 onward

Performance, resilience and customer ownership apply across all five customer groups.

BPCL mapping: models and controls

Draft requirement	EON foundation and project extension	Evidence required
Two custom pipelines; §3 / §4.2.3	EON Live plus site topology, equipment and product data	Model release and approved data register
Hydraulics, pigs, batches, DRA; §4.4	Behavior framework plus validated transport modules	Benchmarks and operating-event comparisons
50 SCADA screens; §4.2.4	Prior EON control-room integration plus BPCL emulation	Screen and tag coverage register
Interlocks, ESD and SIS; Annex B	Executable simulation logic plus buyer cause-and-effect rules	Witnessed logic tests
OPC interface; §4.1 / §4.4	Adapter layer with buyer-agreed OPC profile	Interface and failure-recovery tests

Provisional mapping from bid drafts. No row represents a completed BPCL acceptance test.

BPCL mapping: training and scale

Draft requirement	EON foundation and project extension	Evidence required
Five independent trainees; §4.1-14a	Genesis experience plus isolated model sessions	Concurrent-session isolation test
0.1x to 5x; §4.2.1.1	Runtime time control extended across all services	Speed and numerical-equivalence tests
Freeze, restore, replay; §4.3	Training events plus complete runtime snapshots	Restore and causal replay tests
Assessment and self-training; §4.1-14	Genesis / Assess IQ plus instructor rubrics and reports	Rubric review and report reconciliation
Four 1,500 km models at 5x; §3.2	Scalable session design and optimized solver	Full load test on tendered hardware

Scale and speed are acceptance targets from the drafts, not established EON performance.

BPCL mapping: deployment and lifecycle

Draft requirement	Delivery design	Evidence required
Isolated LAN; §4 / §9	Local packages, local identity and controlled updates	Disconnected operation and hardening records
Engineering station; §4.4	Versioned model editor and separate study copies	Create a model without changing training releases
MAT, FAT, SAT; §5	Traceable model, factory and site test plans	Witnessed reports and defect closure
Training and documentation; §3.5–3.6	Operator, instructor and maintenance material	Courses, manuals and as-built records
Warranty and CAMC; §3.4 / §21	Prime contractor and OEM support responsibilities	Signed service scope and maintenance plan

Software capability is one part of a turnkey supply, installation and service commitment.

The BPCL accuracy gates

Draft criterion	Target in the bid drafts	How to establish acceptance
Critical steady variables	Within $\pm 2\%$, including operation down to 25% load	Agree reference, denominator and operating envelope
Non-critical variables	Within $\pm 10\%$, reached within one minute	Define variable list and stabilization condition
Transient behavior	Direction, magnitude and order; variables and time constants within 5%	Use held-out events and agreed alignment rules
Operator realism	No significant difference identified by experienced operators	Structured expert review alongside numerical tests

Near-zero values need agreed absolute tolerances. Calibration data and test data must be separate.

The test sequence

1 Verify the model

Analytical checks, convergence and independent benchmarks.

2 Calibrate the site

Use approved equipment data and selected historian events.

3 Witness acceptance

Complete model, factory and site tests against the requirement register.

4 Prove operation

Run disconnected, concurrent and recovery tests plus the specified trial.

MAT = model acceptance. FAT = factory acceptance. SAT = site acceptance.

What is familiar and what is difficult

Engineering area	Practical approach	Why care is still needed
Screens, roles and reports	Reuse established application patterns	Exact BPCL behavior and offline dependencies
Scenario and content generation	Extend EON authoring and component reuse	Source ambiguity and specialist review
Shared sessions and replay	Build explicit state and event contracts	Clock consistency, causality and recovery
Pipeline physics and acceptance	Use specialists and validated models	Accuracy, stability, scale and unusual operating states

Standard software patterns reduce effort. They do not remove process-engineering work.

Delivery gates for the first application

Gate	Work package	Exit evidence
Scope and lineage	Original tender, repository audit, interface inventory	Requirement register and verified reuse decisions
Model feasibility	Representative pipeline event on target hardware	Accuracy, speed and scale results
Integrated exercise	One operator, one field role and instructor	Shared state, failures and replay demonstrated
Complete delivery	Site models, screens, logic, tests and training	Buyer acceptance and operational handover

The bid drafts state seven months. A committed schedule needs data access, staffing and validated scope.

Delivery stages preserve the full ambition

Stage	Capability to release	Exit condition
P1 BPCL core	Physics, controls, instructor, offline operation and support	Pass all mandatory buyer and regression cases
P2 Integrated leadership	Field, emergency, AI creation, assessment and work loop	Pass capability parity and published target tests
P3 Domain and scale expansion	Additional physics packs, online context and cloud scale	Validate each declared envelope and service objective
Every release	Owned backlog for every capability and competitive gap	No silent scope deletion or untested superiority claim

The draft seven-month BPCL window is not a delivery promise for every P2 and P3 capability.

The benchmark that makes the claim credible

Measure	Comparable assignment	Decision evidence
Authoring effort	Build an approved pump procedure from the same inputs	Total person-hours, review cycles and elapsed time
Integration effort	Connect the same room and field scenario	Asset/tag mapping effort and defect count
Update effort	Change an approved procedure and affected assets	Cost and consistency across every published view
Training and fidelity	Run agreed normal and abnormal cases	Model errors, missed handoffs and independent assessment

Compare equal fidelity, starting assets and acceptance standards. Report repeat-site economics separately.

The expansion beyond BPCL

Common product core

Sessions, instructor tools, event history, roles and assessment.

Domain packs

Validated pipeline, plant, utility or other equipment behavior.

Site packages

Customer tags, procedures, control screens and approved scenarios.

Work connection

Approved guidance and reviewed lessons across the customer's operation.

A reusable core supports expansion. Each new domain still needs its own validation envelope.

One product across five customer priorities

Simulation depth

Earn confidence in models, controls and engineering decisions.

AI and team practice

Create accepted exercises faster and rehearse the whole operation.

Connected work

Keep approved guidance and reviewed lessons consistent across training and work.

Speed and cost

Prove lower creation effort, update effort and total ownership cost.

Market leadership is the objective. Comparative results become claims only after the corresponding tests.

Evidence and claim wording

Evidence class	Example	Appropriate wording
Documented delivery	ExxonMobil's 2015 EON announcement	EON has co-developed connected operator simulation
EON-reported capability	V20 component library, authoring and work loop	EON describes or demonstrates the stated capability
Observed demonstration	Public EON Live and supplied application images	A demonstration exists; scope of testing is stated
Proposed extension	BPCL physics, shared sessions and new Control Room	Designed to deliver; subject to verification and acceptance

Customer comparison slides use a future-release scenario. Done requires completed delivery and validation.

BPCL scenario catalogue for design

Operations	Abnormal events	Equipment and communication faults
Cold start and hot restart	Leak and rupture	Transmitter freeze, drift and signal loss
Normal shutdown and throughput change	Station and pipeline ESD	Valve stuck, passing or slow
Batch routing and product changeover	High arrival pressure and SRV action	Pump trip, cavitation or degraded performance
Pig launch, tracking and receipt	Stuck pig and off-spec arrival	Power dip, RTU and field communication loss
DRA change and routing changes	Receiving terminal unavailable	Filter restriction and local-device failure

Catalogue derived from the local bid draft. Scenario availability and detailed behavior need verification.

BPCL data and engineering inputs

Input set	Required material	Engineering use
Pipeline and equipment	Route/elevation, pipe data, pump curves, valve coefficients	Topology, boundaries and equipment parameters
Controls	Tags, screens, logic, set-points and cause-and-effect matrix	SCADA emulation and executable logic
Operating evidence	Historian records, products, batches, DRA and temperature	Calibration and independent event validation
Training and service	SOPs, emergency plan, rubrics and hardware constraints	Scenarios, deployment and acceptance plan

Photos accelerate scene creation. They do not reveal all hidden connections or process parameters.

Terms in plain language

Term	Meaning
Digital twin	A digital representation of equipment with the information needed for its intended use
SCADA / HMI	The screens and controls an operator uses to monitor and operate a process
Physics solver	The calculation engine that predicts how pressure, flow or temperature changes
SOP / P&ID	An approved work procedure / a drawing of process equipment and instruments
ESD / SIS	Emergency shutdown / the safety instrumented functions being emulated for training

Sources for the product and BPCL design

EON v20

Pages 6–31: products and demonstrations. Pages 10 and 57: governance. Pages 67–72: qualifications and roadmap.

BPCL bid drafts

3b Technical Bid and 2b Partner Brief. Tender identity GEM/2026/B/8062246. Original buyer files must be reconciled.

EON history

ExxonMobil announcement, 4 May 2015.

Technical references

FMI 3.0.2 specification and FEMA's explanation of emergency coordination.

Detailed URLs and source notes accompany the relevant slides.

Sources for the competitive analysis

AVEVA and Emerson

XR Studio training and operations pages. DeltaV Mimic Field 3D product page.

Honeywell and Yokogawa

IFS launch description. JCCP implementation. OmegaLand 360° announcement.

Pipeline specialists

Atmos Trainer and DNV Synergi Trainer product pages.

Rapid authoring

SynergyXR Procedure Builder release documentation and Uptale platform services.

Published capabilities establish overlap. Price, effort and superiority require a comparable benchmark.

Sources for the expanded capability benchmark

AVEVA / Schneider

OTS delivery, dynamic simulation and PLC emulation.

Honeywell

UniSim Design modeling and APIs; Tutor assessment.

Emerson

DeltaV Mimic engineering and lifecycle simulation.

Yokogawa

OTS and MIRROR PLANT for operating-phase models.

Official product pages reviewed 27 September 2026. Vendor claims are not independent performance tests.