

connect

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SeeQ®

The Evolution of Seeq in Oil & Gas: Industry Solutions & Capabilities

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Agenda

- Industry Snapshot
- Introducing Seeq Industry Solutions
- *Seeq for O&G: Refining*
- Providing Solutions with Radix
- Focusing on Asset Health and Equipment Reliability
- What's next?
- Today's wrap-up

Industry Leaders Choose Seeq

3

of the top 5 global
petrochemical
companies

4

of the top 5 global
oil & gas
companies

64%

of American
refining capacity
companies

Honeywell
UOP

أرامكو السعودية
Saudi Aramco

Marathon Oil



Williams



equitrans
Midstream

ExxonMobil

ENERGY
TRANSFER



SYENSQO

BASF
We create chemistry

Westlake

Chemours

allnex

INDORAMA
VENTURES

Air Liquide

Cargill

Rio Tinto

GUARDIAN
INDUSTRIES

BIRLA CARBON

ALBEMARLE

CASERONES
PROYECTO DE SGM MINERA LUMINA COPPER CHILE

CEMEX

Alcoa

Martin
Marietta

Bristol Myers
Squibb

VERTEX

Roche

Abbott

Genentech

Lilly

Lonza

MERCK

sanofi

intel

3M

T. Marzetti
A LANCASTER COLONY COMPANY

PRATT
INDUSTRIES

British Sugar

International
Paper

TVA
TENNESSEE
VALLEY
AUTHORITY

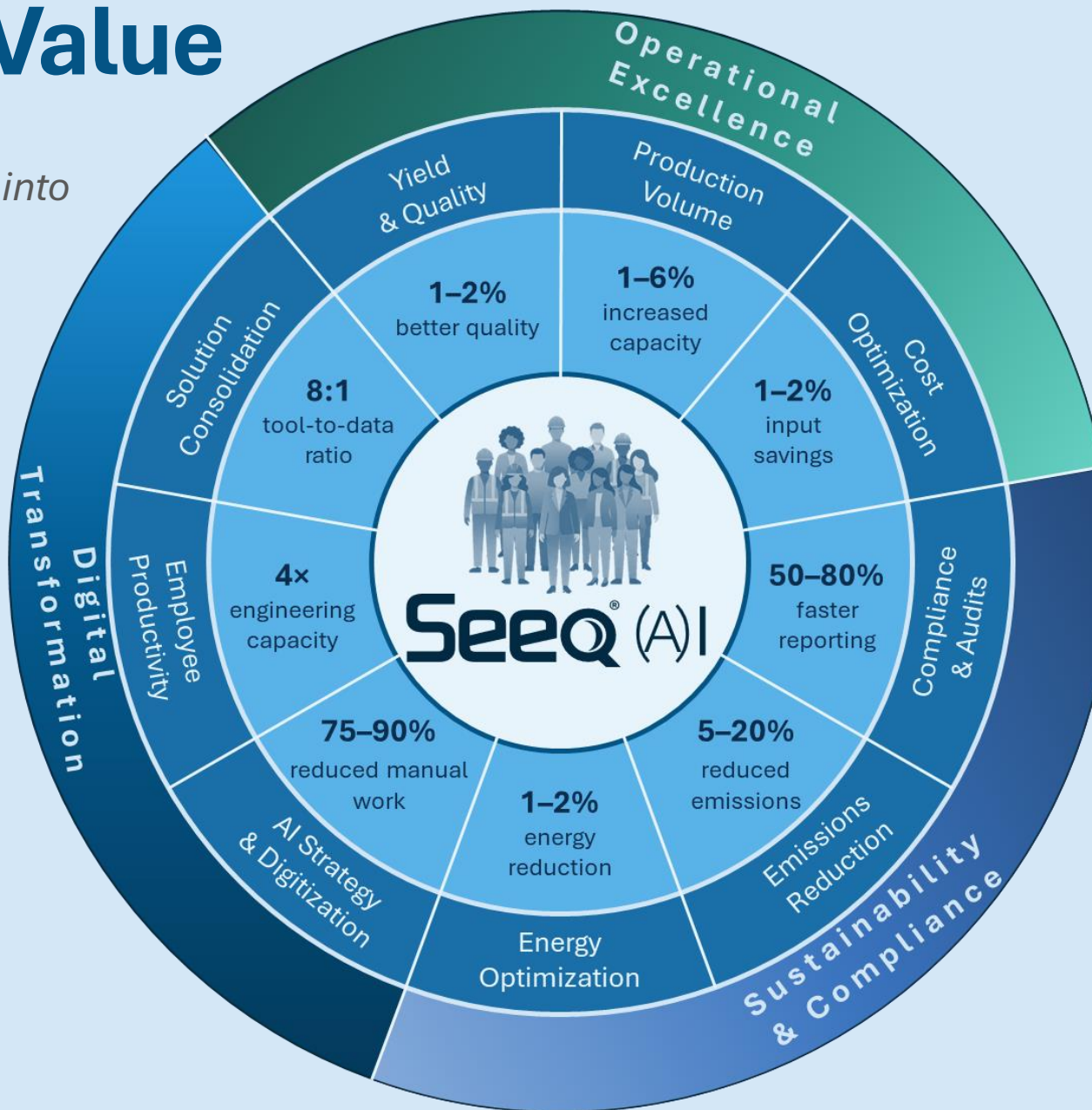
Dominion
Energy

ORMAT

conneqt

Compounding Value

Gains across operations compound into enterprise-wide impact



Industry Solutions

Getting to Outcomes

Planning Implementation



Deliver meaningful change to parameters/KPIs that the business cares about that directly or indirectly have a business impact

Getting to Outcomes



Upstream	Midstream	Downstream	LNG
Volatile crude prices & declining mature fields	Pressure to maximize throughput & meet delivery contracts	Tight refining margins & rising energy costs	High global LNG demand & need for export capacity
Maximize recovery & production uptime	Protect throughput & asset reliability	Improve margin & energy efficiency	Maximize liquefaction train availability
Reduce unplanned deferment from artificial lift	Improve compressor station availability	Reduce energy intensity across units	Cut refrigerant compressor trips & boil-off
Cut lift-related downtime by 15%	Reduce unplanned compressor downtime by 20%	Improve energy efficiency by 2%	Increase train uptime / throughput by 3%
ESP / rod-pump health & failure prediction	Recip & centrifugal compressor anomaly detection	Furnace / exchanger fouling & boiler steam optimization	Refrigerant compressor health & boil-off monitoring

Industry Solutions

SeeQ®
FOR
PHARMA



*Operational
Efficiency and OEE
Continuous Process
Verification*

SeeQ®
FOR
OIL & GAS



Refining

SeeQ®
FOR
CHEMICALS



*Operations
Foundation*

SeeQ®
FOR
MINING & METALS



Critical Minerals

Industry Solutions – Focus on High Impact

SeeQ[®]
FOR
PHARMA



Drug Manufacturers

- ↑ Throughput and capacity
- ↓ Cost per batch
- ↓ Drug shortages

OEE+ analytics feed GMP-relevant decisions

SeeQ[®]
FOR
OIL & GAS



Refining

- ↑ Throughput and margin
- ↓ Energy intensity
- ↓ Unplanned outages

Templates and integration with CMMS

SeeQ[®]
FOR
CHEMICALS



Specialty Chemicals

- ↑ Throughput and yield
- ↓ Variability
- ↓ Quality deviations

Prioritization for operators and engineers

SeeQ[®]
FOR
MINING & METALS



Critical Minerals

- ↑ Throughput and recovery
- ↓ Energy intensity
- ↓ Downtime events

Grinding and flotation leading indicators and trade-off views

Radix



WHO IS RADIX

180+

Customers

4,500+

Transformational
Projects

1,800

Dedicated
Experts

35+

Countries
Globally

500+

Engineers

100+

Data
Scientists

800+

Technology &
Industry
Experts



Houston



Rio De Janeiro
São Paulo
Belo Horizonte



Amsterdam

RADIX CUSTOMERS



RADIX CUSTOMERS



"The Radix team has a level of capability and expertise, the breadth of which has been a great partnership for Devon. We've got a team that works with real-time streaming data, production data, but their ability to look across a broad swath of different technologies and what could be required - that partnership with our own internal teams is what has been special and what has allowed us to deliver."

- Trey Lowe, Chief Technology Officer, Devon Energy



BV

"This result [of this project] was only possible thanks to the preparation, planning, professionalism, and dedication of everyone involved. In many ways, this project was a pioneer and became a reference."

- Petrobras Executive

"What we find in the partnership with Radix is that we have a lot of skill sets from industry, chemical engineers, mechanical engineers, that now have turned into a hybrid of technology domain skill sets. That has been a really exciting journey for us - the speed of turning our vision and our dream into our reality in a very short amount of time."

- Ibrahim Al-Syed, Directory, Digital Transformation Manufacturing, Celanese



"What the teams have accomplished in the past six months reflects a very high level of engineering collaboration and discipline. Together with Radix, we successfully tropicalized a project initially designed for the U.S., adapting equipment selection, utilities, layout, and integration strategies to Brazil. This approach enabled close to a 40% reduction in cost per ton of biooil produced, while leveraging strong synergies with existing industrial assets and local capabilities."

Luciano Zamberlan, VP of Operations and Engineering, Cemvita



RADIX TURNS THE INDUSTRY SOLUTION INTO AN OPERATING CAPABILITY

1. Define Value:

Align on outcomes, KPIs, and decision owners.

2. Contextualize Data:

Integrate, cleanse, and align data across assets, systems, and time.

3. Build Models:

Combine first-principles, physics, and ML with refinery context.

4. Quantify Impact:

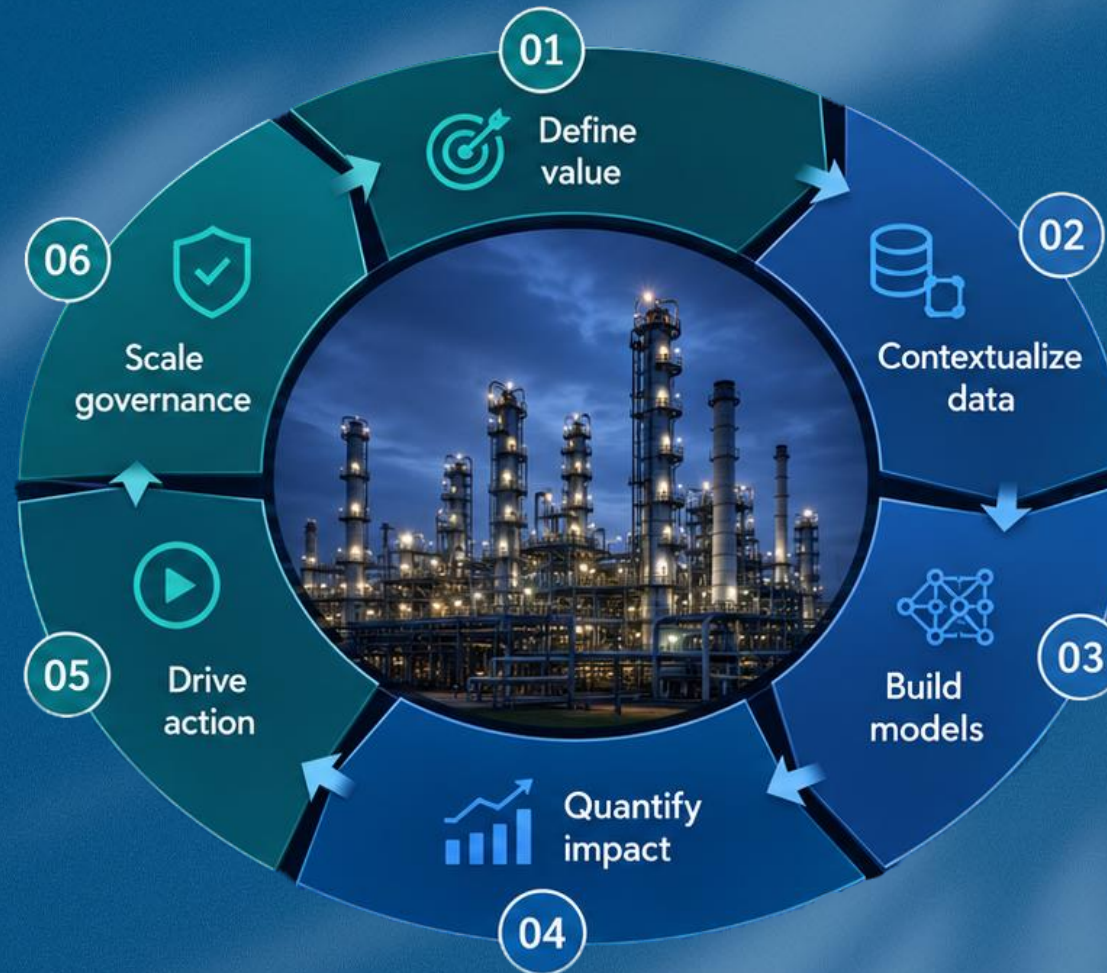
Measure value, risk and trade-offs to prioritize what matters most.

5. Drive Action:

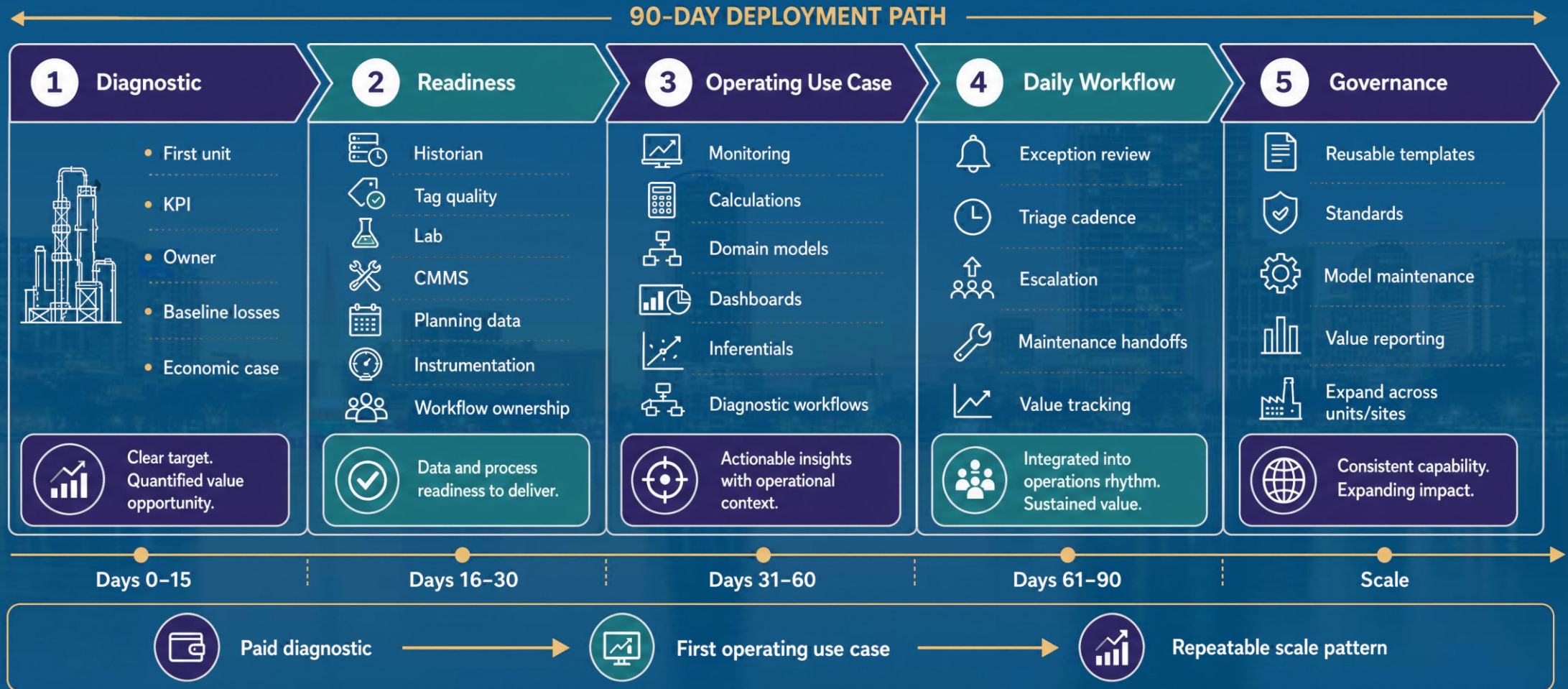
Embed insights into workflows, tools, and governance for action.

6. Scale Governance:

Institutionalize learnings, standardize practices, and continuously drive value.



90-DAY DEPLOYMENT PATH FROM VALUE CASE TO SCALE



Industry Solutions Coming Soon

SeeQ®
FOR
OIL & GAS

SeeQ®
FOR
PHARMA

SeeQ®
FOR
OIL & GAS

SeeQ®
FOR
CHEMICALS

SeeQ®
FOR
MINING & METALS



Upstream

Wells Monitoring and Surveillance

↑ Runtime and field yield

↓ Production deferment

Exception-driven surveillance and CMMS workflows at fleet scale

Asset Health Monitoring

- CDMO Data Sharing and Tech Transfer
- *Multivariate Batch Monitoring*

- Upstream
- *Midstream*
- *Downstream*
- *LNG*

- Steel
- Cement
- Pulp & Paper



Focusing on Asset Health & Equipment Reliability

Enterprise Monitoring: Asset Health and Equipment Reliability

Improve Productivity, Reduce Downtime, and Drive Remote Collaboration through Fleet-wide Monitoring



Monitoring 4000+ Wells
1500 Tasks Autogenerated/month



ML-based monitoring of
38k+ Variables on 4000+ Assets



“Easy button” ML monitoring
scaled to 600+ assets

Deploy a fleet-wide monitoring programs as quickly as 3 months

- Monitor thousands of assets from a central location
- Utilize univariate, ML-based, or proprietary algorithms to identify anomalies
- Consume alerts with agentic workflows, dashboards, or other integrations

Agentic AI Workflow Takeaways

Production-ready monitoring and diagnostics, **from the wellhead to the refinery**

UPSTREAM

Wells, artificial lift, and wellsite compression.
Catch degradation before it becomes deferred production.

MIDSTREAM

Pipeline pumps and reciprocating / centrifugal compression. Avoid unplanned downtime and protect throughput.

DOWNSTREAM

Refinery rotating equipment, exchangers, and furnaces. Reduce upsets and protect runs between turnarounds.

What the agent delivers on every asset:

- **Detect what alarms can't:** slow degradation flagged months before any threshold trips
- **Maintain on condition, not the calendar:** act on real asset health instead of fixed schedules
- **Explainable, not a black box:** drifting signals, FMEA match, and ruled-out failure modes, all visible
- **Root cause, not just a score:** plain-language diagnosis with confidence levels and an evidence package
- **Close the loop:** auto-generates and submits the work order (SAP PM and others) with the evidence trail

Wrap-Up

Three Stories, One Through-Line

Pipelines, compliance, refining — one pattern

Each talk replaced manual, siloed spreadsheets with automated, scaled analytics that put quantified decisions where the work actually happens



ANALYZE

MARATHON PIPE LINE · A. FOLTZ

Monte Carlo Network Capacity & High-Pressure Risk

From deterministic estimates to 10,000-iteration stochastic simulation in Seeq Data Lab.

6,500 BPD

volume curtailment avoided
>50% year-over-year cut in DRA spend



OPERATIONALIZE

MARATHON PETROLEUM · S. IBARRA

Environmental Compliance with Seeq Vantage

From homebrew spreadsheets to automated, audit-ready compliance built into the daily routine.

Words → Math

annotations become live compliance calcs
Self-service apps reduce permit deviations



SCALE

PBF ENERGY · D. AICHINGER + K. CLARK

Enterprise Energy Stewardship at Scale

From monthly manual spreadsheets to daily, equipment-level KPIs across every site.

337+ KPIs

live across 6 refineries, 114 units
~\$160M/yr enterprise opex-savings lever



TOGETHER, THEY TURN THE DECISION INTELLIGENCE FLYWHEEL

ANALYZE



OPERATIONALIZE



SCALE

Analyze the data, operationalize the decision, scale it across the enterprise, then repeat

Wednesday, June 3rd

TRACK	ROOM
Innovation with AI	Palm A & B
Performance Optimization	Palm C
Champions	Cypress
Asset Reliability	Dogwood

Topical Breakout Tracks (Level 1, Lower Level)

Buses depart @ 6:30 pm



Thank you!



SeeQ[®] *ANALYTICS*
SeeQ[®] *ENTERPRISE*
SeeQ[®] *INTELLIGENCE*

	Seeq for Pharma: Operational Efficiency and OEE	Seeq for Oil and Gas: Refining	Seeq for Chemicals: Operations Foundation	Seeq for Mining and Metals: Critical Minerals
Launch	May 12, 2026	June 1, 2026	June 1, 2026	June 1, 2026
Outcome(s)	Increased throughput and capacity. Lower cost per batch. Mitigate drug shortages by meeting demand.	Higher throughput and margin, lower energy intensity, and fewer unplanned outages across refining operations.	Better yield, better throughput, lower variability, fewer quality deviations, and clearer prioritization for operators and engineers.	Higher mineral recovery by , lower energy intensity and extend asset life by enabling confident decision-making based on grinding and flotation leading indicators and clear trade-off views.
Target prospects	Drug manufacturers only (no medical devices). Global Big Pharma, top CDMOs, mid/specialty pharma.	Downstream (Refining and Petrochemicals)	Specialty Chemicals or Batch Manufacturer that are early in their analytics journey to remove barriers for adopting Seeq. Special focus on current Trend Miner customers.	Critical Minerals concentrators (copper, lead, zinc, nickel, gold, and silver)
What is it?	• Vantage for management by exception, capturing of reason codes • SPC and other Statistical calculations for variability in event detection (batches, shifts, changeovers, cleaning/CIP/SIP, etc.) • Seeq for Pharma capabilities (locking, versioning, audit trails, test/production tenants, structured releases) where OEE+ analytics feed GMP-relevant decisions • AI summarization, prescriptive recommendations and automated reporting • Optional integration of ML and MVDA outputs from Data Lab or external platforms • In the future, Reusable Models that encapsulate OEE logic	• Seeq Industry Models GA/shipped models for heat exchangers, boilers, controllers, rotating equipment, anomaly detection; refining models (distillation, blending, quality/giveaway) in development • SPC for process stability, drift, and constraint monitoring (temperature, pressure, catalyst performance) • MVDA (PCA/PLS) for multivariate process behavior, root cause, and yield/quality prediction • Vantage for event detection and exception-based monitoring across process units (fouling, instability, control loop drift) • CMMS-integrated workflows for alerting, triage, and maintenance action • AI (Seeq Intelligence) for natural language querying and automated insight generation	• Workbench. fundamental time-series and batch analytics, golden batch templates, feature extraction • Organizer. dashboards and KPI views organized by batch, product, phase, not just asset • Scaling Tables & SPC. Basic statistics/Six Sigma. simple distribution, sigma, capability-style analysis • Advanced Analytics. AI Use Case library to kick off model and potentially models if calculations can be packaged this way.	• Data & context layer. Connections to historians and SCADA for process signals. Optional integration with ERP/CMMS for asset, cost, and maintenance data or contextual tags for operating states. • Grinding model: Phenomenological estimator as a virtual sensor, operating-regime detection, and recommendation engine. • Flotation Model: Adaptive feed characterization via clustering, recommendation engine for the operating envelope. • Vantage to capture and create workflows for anomalies. AI will be used to interact for knowledge creation, transfer and visualization.
Seeq license (Intelligence highly encouraged)	Seeq for Pharma and Enterprise	Seeq Enterprise		
Services Providers	Accenture, Cognizant, Reckamp and Professional Services	Radix and Professional Services	Professional Services and Partner Ecosystem	Vertex and Professional Services



Seeq for O&G: Refining

Seeq for O&G: Refining

Data & Systems Layer AVEVA PI · Aspen IP.21 · Honeywell PHD · OPC-UA · DCS / APC · LIMS · CMMS (SAP PM / Maximo) · ERP · LP Planning

SEEQ ENTERPRISE

Seeq Workbench SPC · MVDA · capsules · event detection · scaling

Process Deviations & Instability

Product Giveaway and Off-Spec

Constraints & Bottlenecks

Quality / Loop & Instrument Drift

Seeq Templates packaged calculations (shipped)

Control Loop Performance
Monitoring

Heat Exchanger Performance
Monitoring

Detect Process Change (Historical)

SPC and Statistics

SEEQ VANTAGE

Monitor by Exception

Operationalize analytics at scale — continuously watch every unit & asset, surface only the exceptions that matter, and route them to the right owner for action

Watching: throughput · yield · giveaway · constraint use · energy intensity · utilization · off-spec · equipment health

SEEQ INTELLIGENCE

Agent Q, Agent Builder — natural-language query · automated insight · root-cause assistance · recommended next-best action

Action optimize to economic limits · cut giveaway & off-spec · prevent upsets & downtime · just-in-time maintenance · cut energy

Value: +1% throughput · giveaway \$0.2–0.4/bbl · -5% maintenance cost · -5% energy intensity



Three Main Outcomes Delivered in Refining

Margin Optimization (Yield, Giveaway, Constraints)



Maximized C5 recovery on Rheniformer stabilizer via temperature optimization; **~\$2.7M/year** gross margin uplift



Fuels blending analytics to cut giveaway and off-spec risk; **~\$27M/year** realized savings with potential to reach **multi-million dollar savings per year**

- Throughput Constraint Identification
- Yield Optimization Across Units
- Product Giveaway Reduction
- Blend Quality Monitoring

Increase Operational Reliability (Process Stability and Asset Health)



Reactor/regenerator cycle tracking and optimization; **>\$720K/year** value from small reductions in cycle-time/yield losses and fewer upsets



Monitors critical equipment and transient events across key refinery units; reduced unplanned downtime and protected **multi-million-dollar** annual profit from avoided outages

- Process Upset Detection
- Transient Event Detection
- Equipment Health Monitoring
- Maintenance & Turnaround Optimization

Energy Efficiency and Emissions Reduction



Energy-management dashboards for boilers, furnaces, and steam/O₂ control; starting at **\$10M/year** savings from improved energy efficiency



PARKLAND

Applied Seeq on flare flows to establish a true baseline and flag excess flaring; analyzed >10 years of data quickly and **identified and mitigated ~\$600K/year of excess flaring**

- Heat Exchanger Fouling Detection
- Furnace Efficiency Monitoring
- Hydrogen Network Optimization
- Utility Consumption Optimization

Partner with us to deploy these production-ready solutions **as** quickly as 3 months.

Seeq Industry Templates

Pre-built domain templates powering the Seeq for O&G: Refining Industry Solution

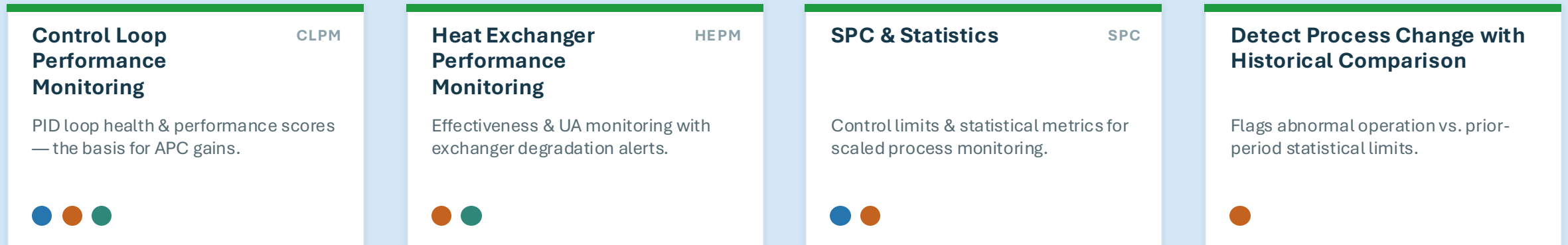
Outcome 1 — Margin Optimization

Outcome 2 — Process Stability & Throughput

Outcome 3 — Energy Efficiency

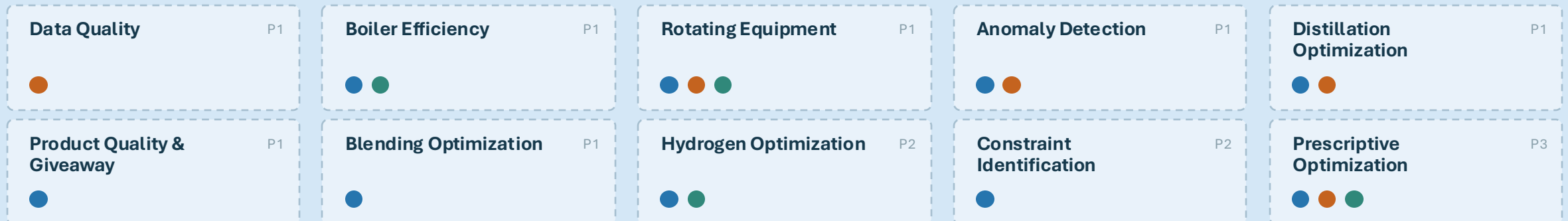
Shipped Templates — Available Now

4 production-ready



Templates Under Research — Roadmap Expansion

10 under research



Industry Templates encapsulate domain engineering into reusable computational structures — performance indicators, health metrics, and diagnostic conditions across refinery operations.

Better Together | Seeq Enterprise Accelerators

Accelerating data-driven decisions, at scale

Packaged Calculations

“I’ve built my best practice calculations for one unit. Now I want it to be reusable.”

Contextualized Data

“I have a list of tags. How do I organize this?”

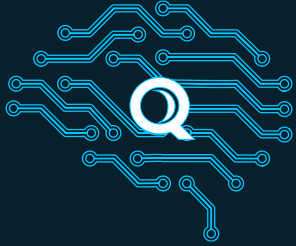
Scale your Analysis

“I need to deploy my calculations to 1000s of assets”

Seeq VANTAGE

Investigate, Analyze, Act
“I need to efficiently monitor my asset health to investigate, prioritize, and make data-driven decisions”

Seeq Intelligence



Agent Q

AI Analyst

Synthesis of Information



Agent Extensibility

Bi-Directional

Agent to Agent /
Custom Agents

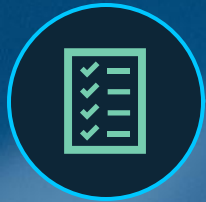


Document Access

Procedures, Manuals,
Investigations, etc.

Solve your most challenging problem with our expert team and proven **methodology.**

Production-ready, scalable solutions



PHASE 00

Qualification

Identify Gaps

Assess data infrastructure, historical data, and organizational support



PHASE 01

Design

Set the foundation

We map your data environment, define the right use cases, and architect solutions built to deliver value from day one.

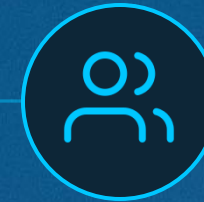


PHASE 02

Build

Move fast. Stay precise

Our experts take the keyboard — prototyping, iterating, and integrating until your solution is production-ready.



PHASE 03

Enable

Make it stick

We embed change management into every engagement so your team adopts quickly and impact gets documented and repeated.



PHASE 04

Operationalize

Go into production

With a governance strategy and execution roadmap in hand, you're equipped to go live.

Authority

INDUSTRY + DATA
SCIENCE EXPERTISE

21 yrs

AVG. TEAM EXPERIENCE

3 mo

TIME TO PRODUCTION

1,000s

CUSTOMER
ENGAGEMENTS