



EMERSON EXCHANGE 2025

ACCELERATING INNOVATION



ACCELERATING
INNOVATION

Catalyzing Change: A Collaboration to Crack the Code in Catalyst Activation

3-1805

Emerson Exchange 2025

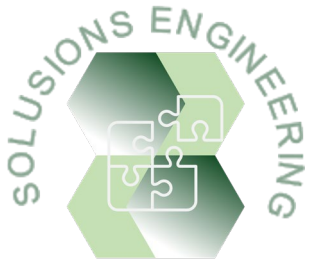
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Inquiries should be directed to:
EmersonExchange@Emerson.com



✓ **What does success really look like in a high-stakes industrial project ?**



Emerson Impact Partner

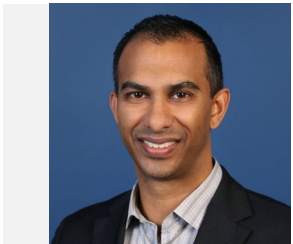
✓ **What Role does Collaboration & Innovation play in simplifying complexity in project**





Neil Gordon

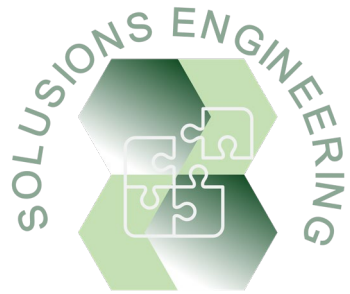
President and Founder | Solutions Engineering & Consulting Inc.



Trishin Naidu

Account Manager, Capital Projects | Lakeside Process Controls



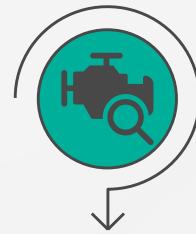


Solutions Engineering & Consulting Inc.



Engineering Solutions

Combustion applications.
Safety Instrumented
Systems



System Expertise

Design, supply, &
cradle-to-grave
support of
systems



Technical Knowledge

System Integrator/
OEM with diverse
expertise and
multi-discipline
engineering team.



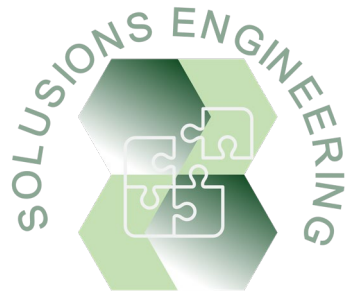
Industry Focus

Petrochemical,
Chemical, Cement,
Mining,
Wastewater,
Municipal Landfill
+more



Global Experience

Catalyst Activators:
Over twenty (20)
systems deployed
with our OEM
partner.



Bigelow-Liptak/Solutions Engineering & Consulting



Project Overview

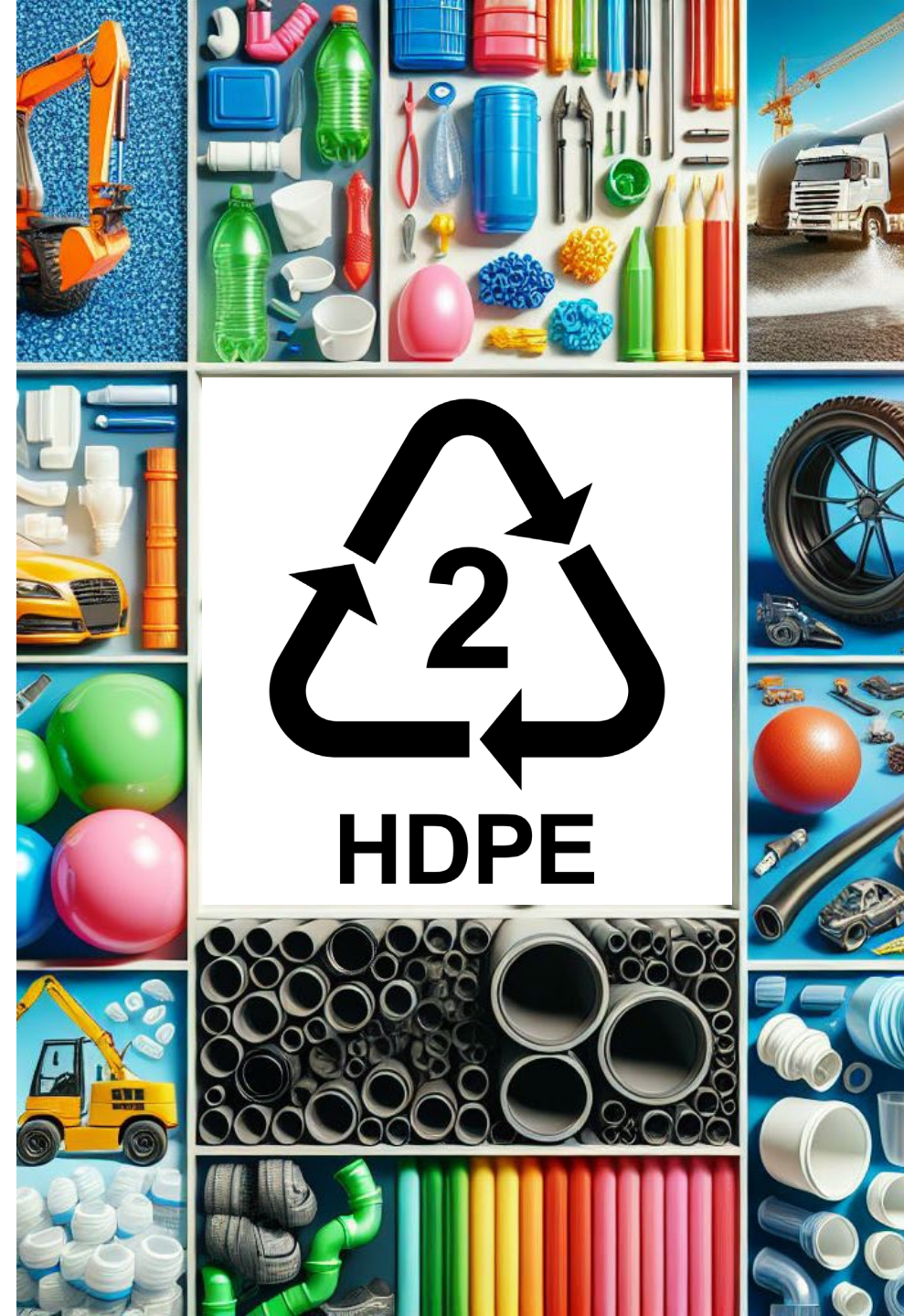
Golden Triangle Polymers



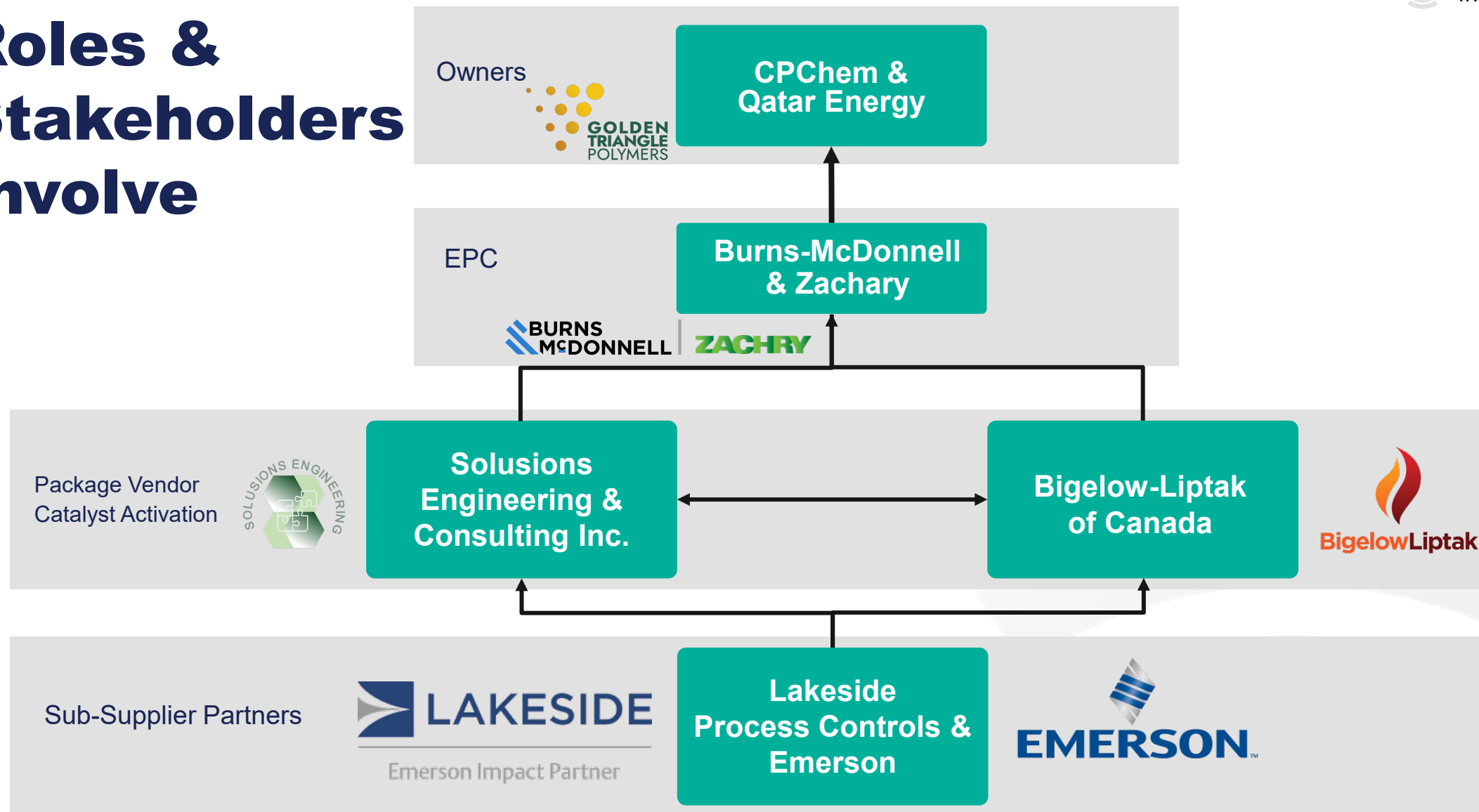
Golden Triangle Polymers

Why HDPE?

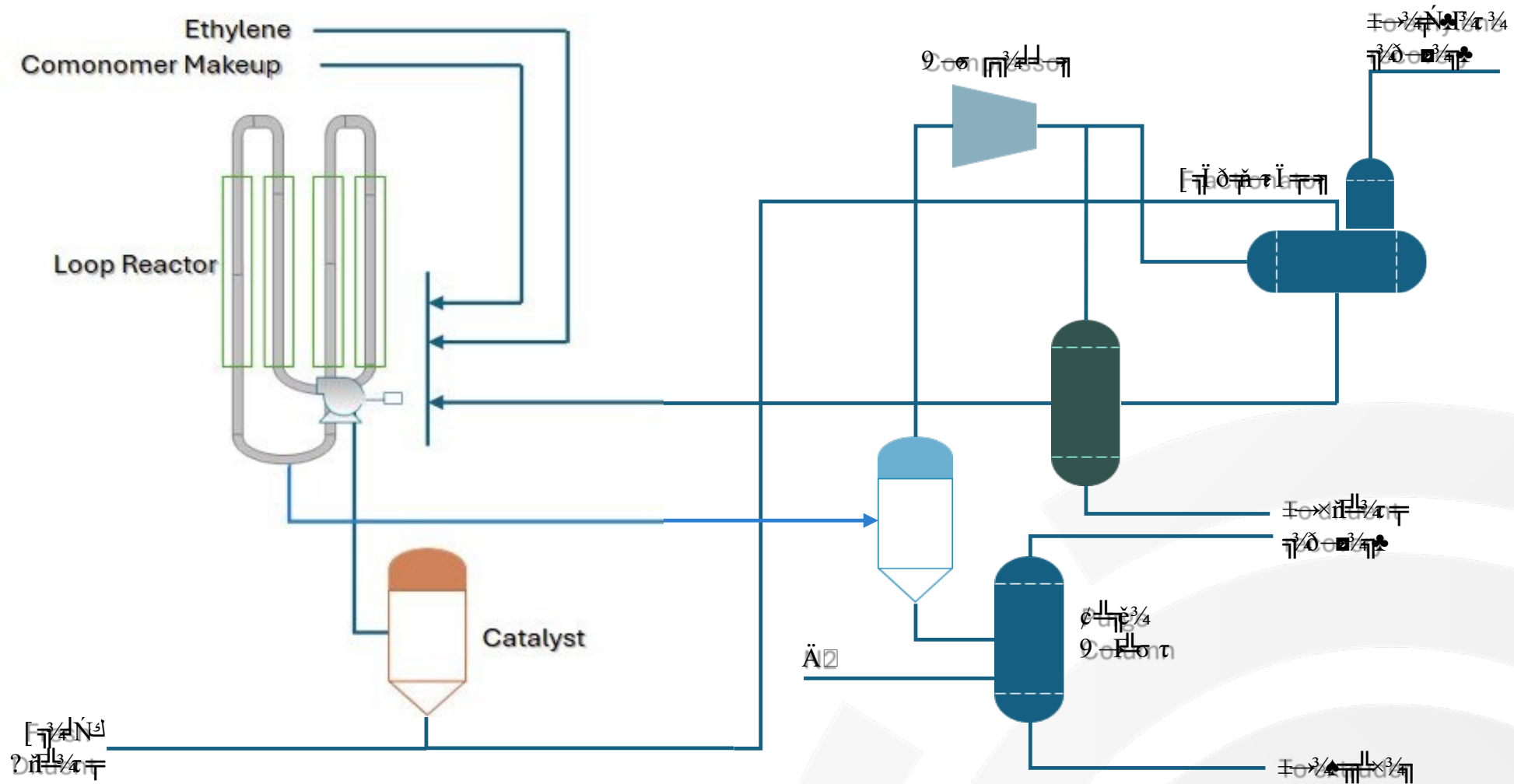
- 100% recyclable
- Global market demand is growing at expected 4-6% CAGR
- Versatile material used heavily in:
 - Construction
 - Packaging
 - Automotive industries.



Roles & Stakeholders Involve

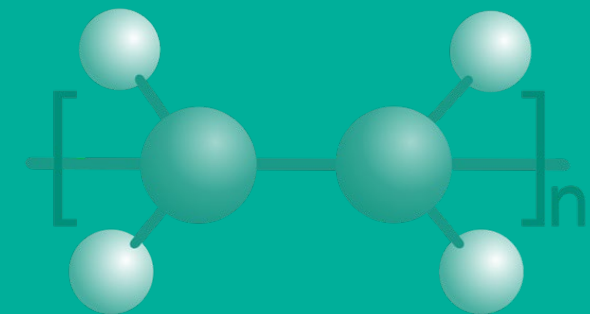
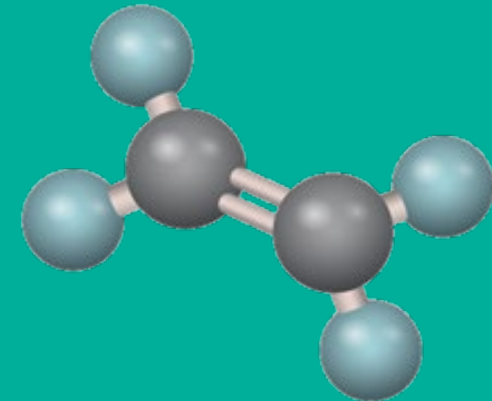


Process & Technology



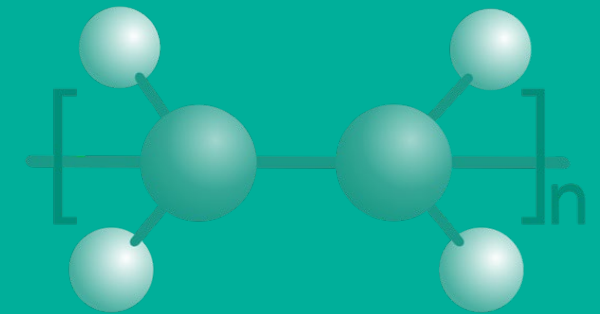
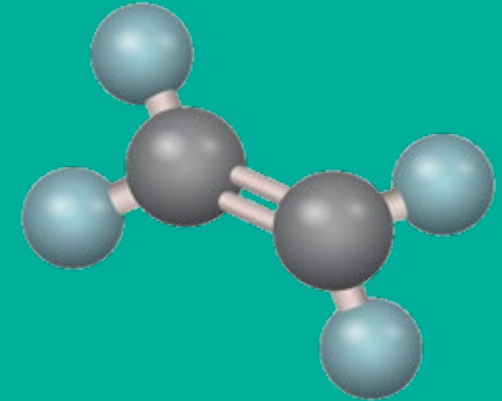
Process & Technology

- The HDPE Technology is based on the Phillips Process first commercialized in 1961 by Phillips Petroleum Corporation.
- Catalyst is chromium oxide on a high-surface area silica substrate.
- "Raw" Catalyst is heated in a Fluidized Bed (Reactor) in a Batch Operation.
- Catalyst is "Activated" at elevated temperature where Trivalent Chromium oxidizes to Hexavalent chromium. The valence state is increased (Cr^{+3} to Cr^{+6}).



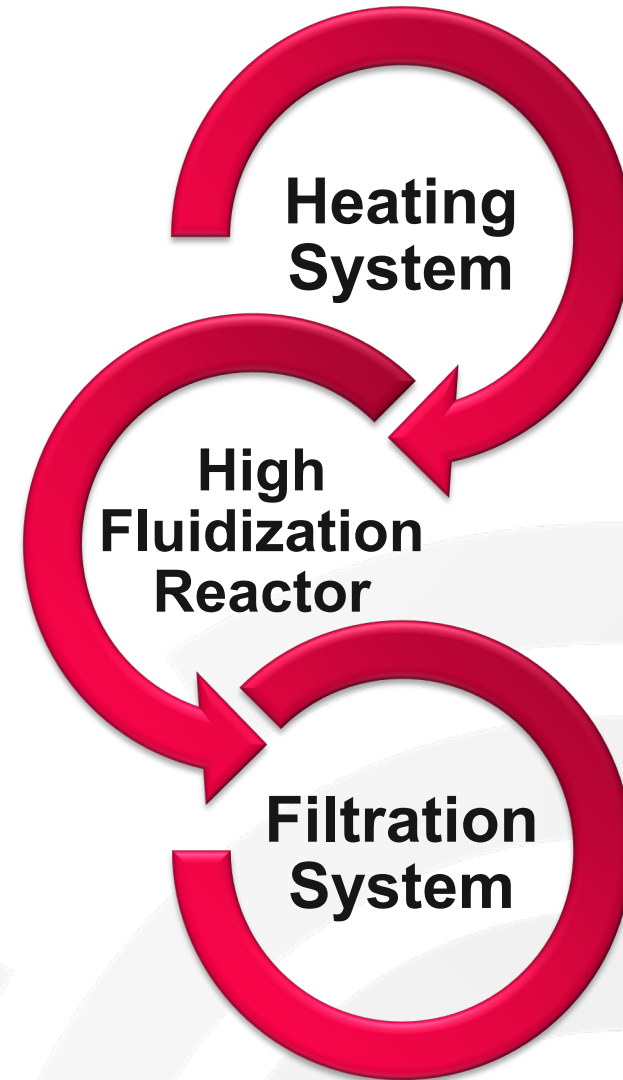
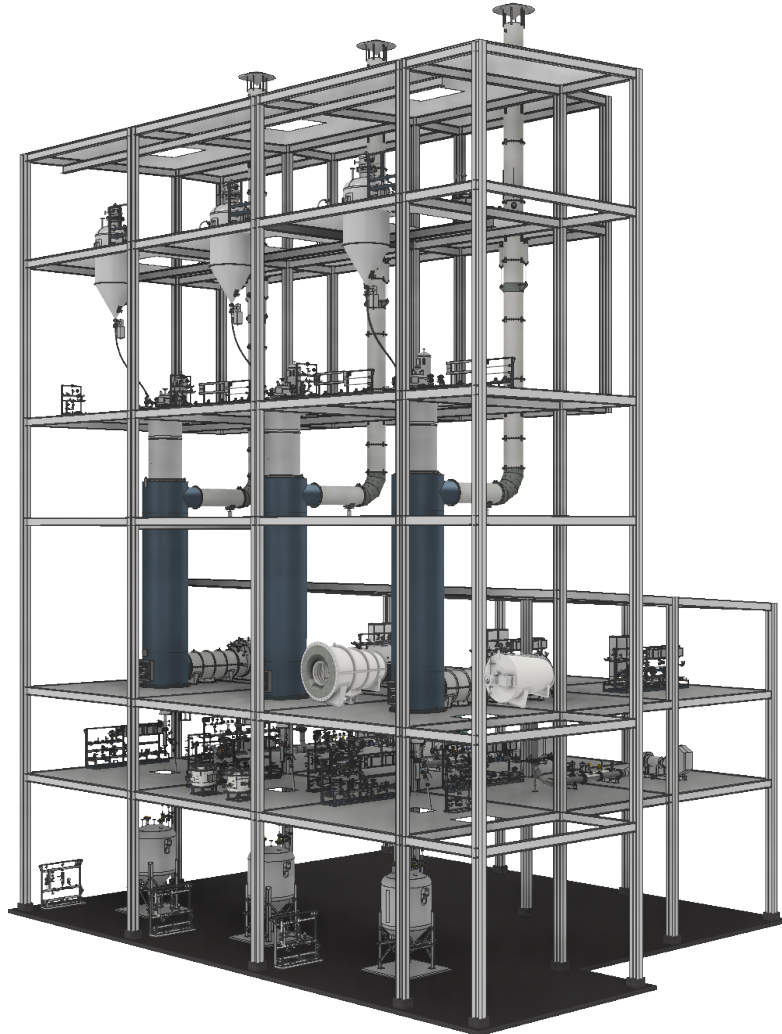
Process & Technology

- Catalyst is introduced into the polymerization reactor as slurry in a saturated hydrocarbon (iso-butane)
- The "Activated" catalyst is reacted with ethylene monomer to polyethylene during polymerization in the loop reactor.
- Phillips Catalyst accounts for 25% of the global polyethylene production

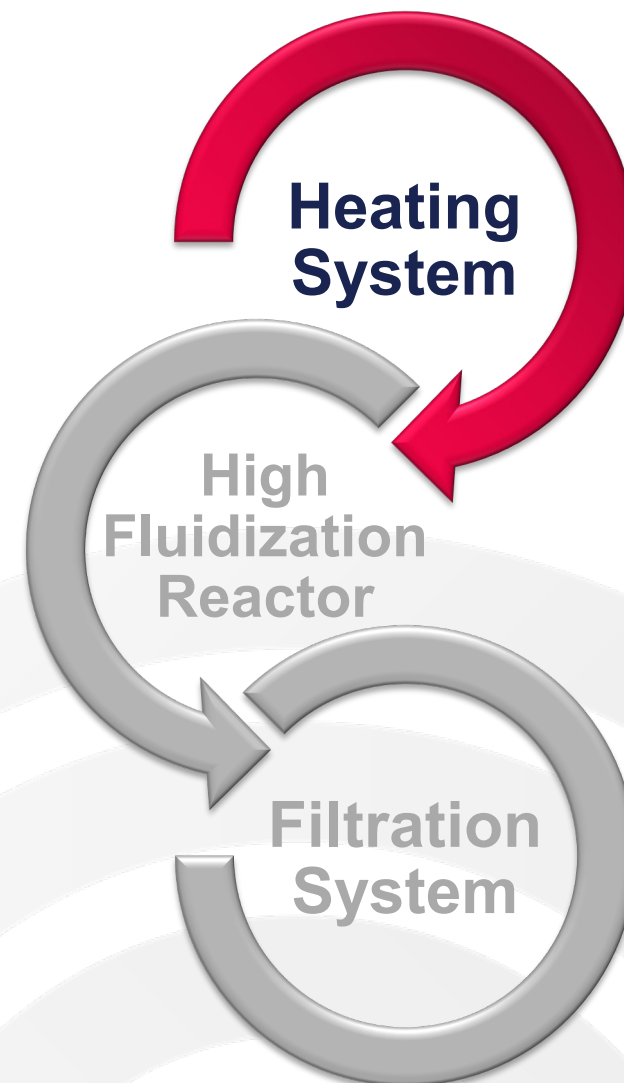
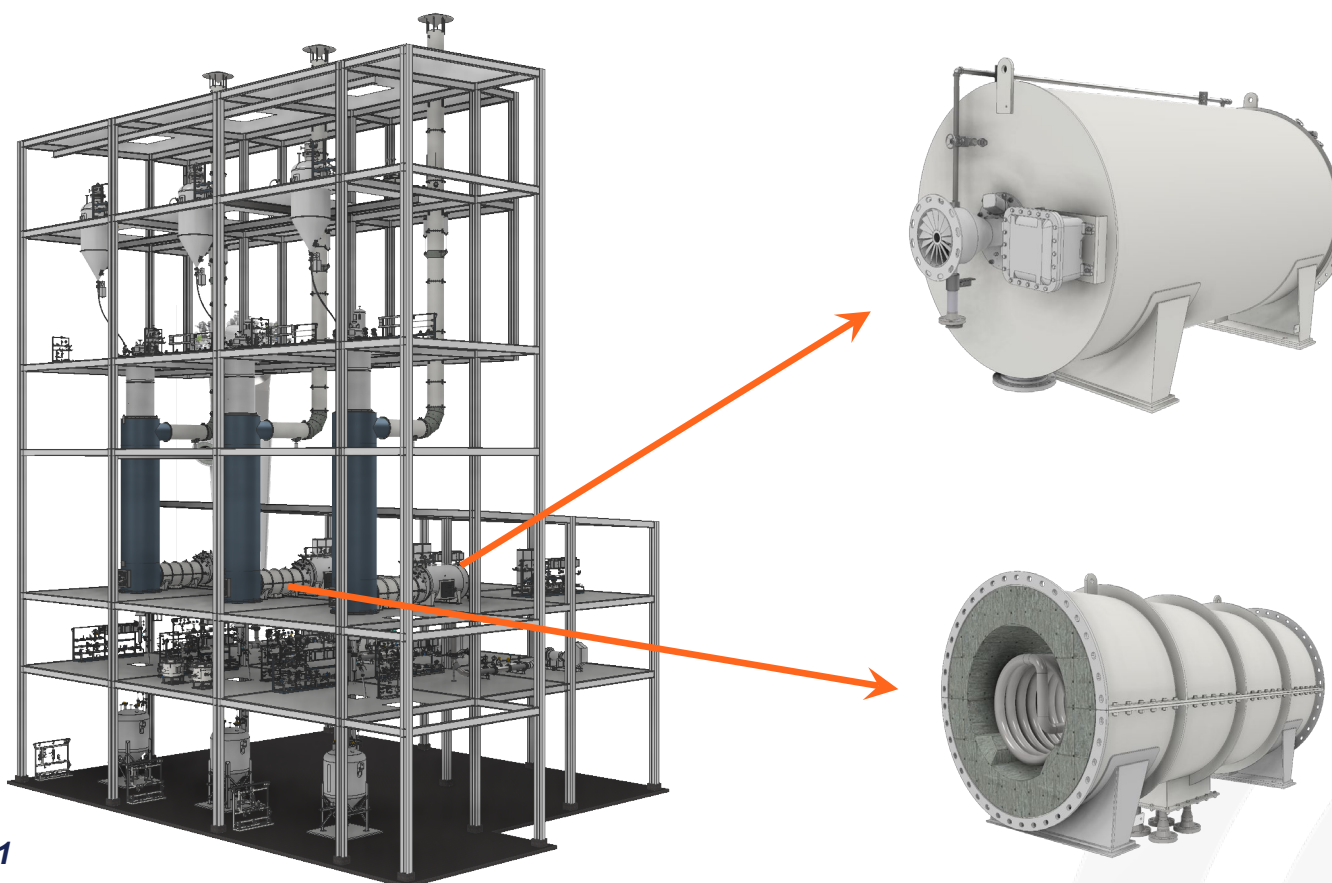


Project Execution

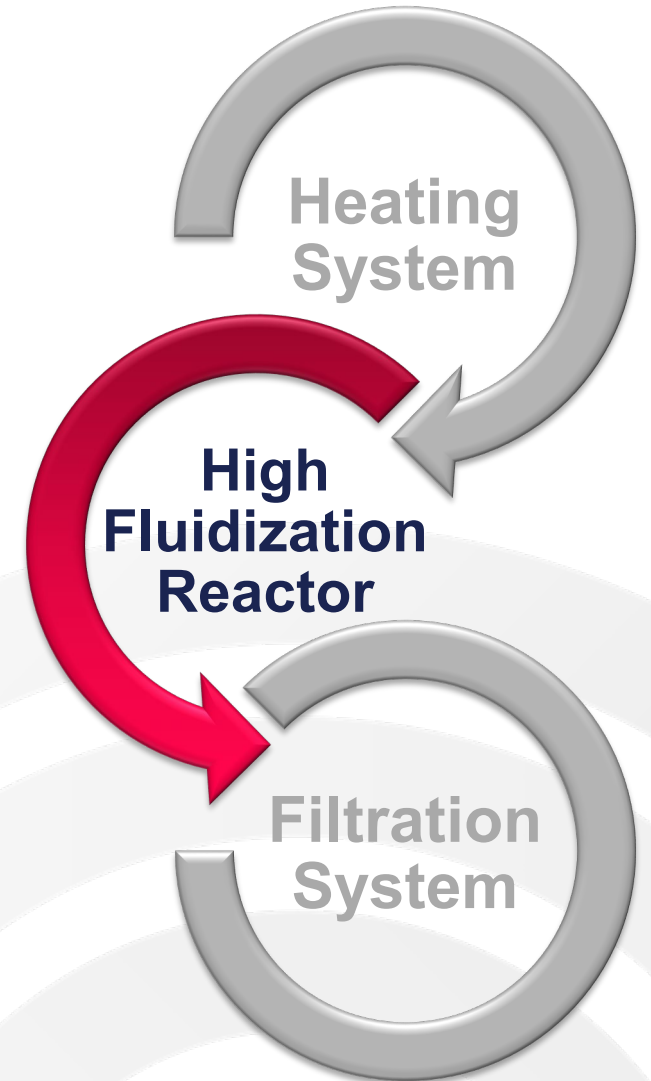
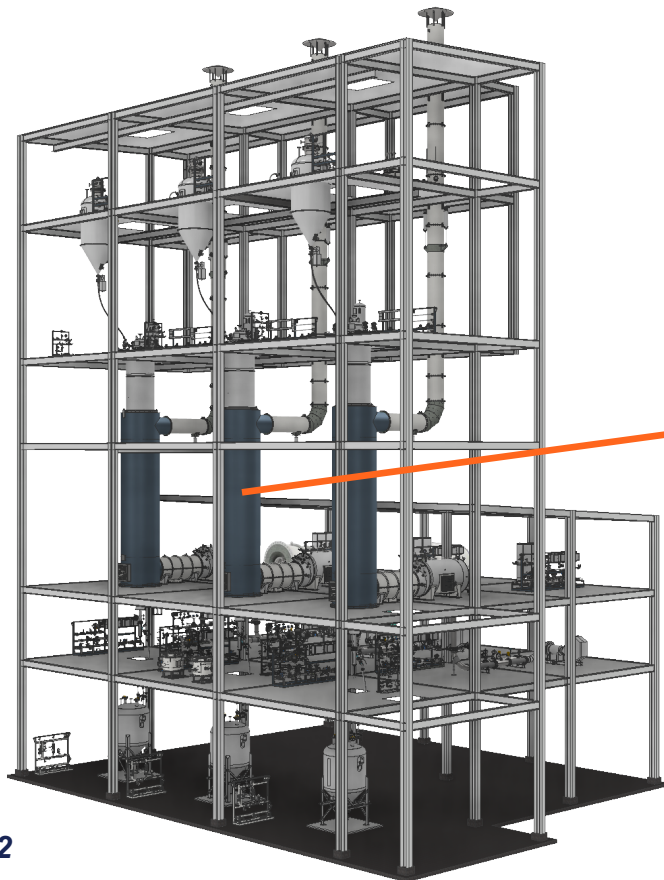
Catalyst Activation Process Subsystems



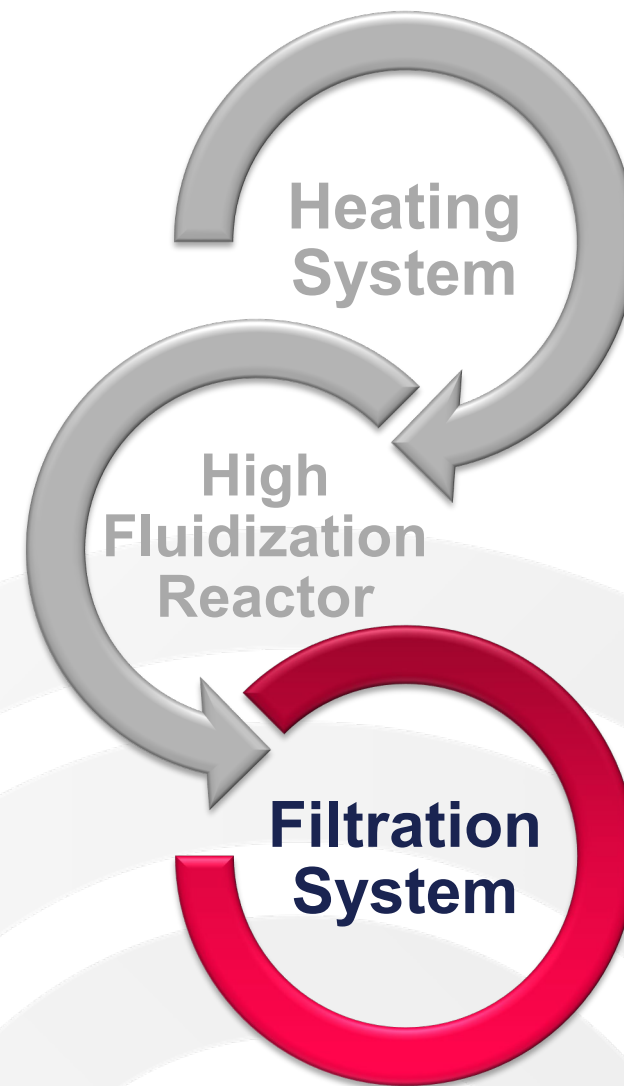
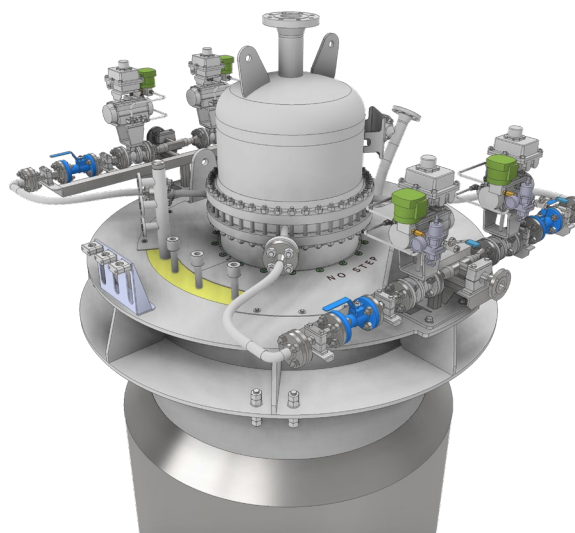
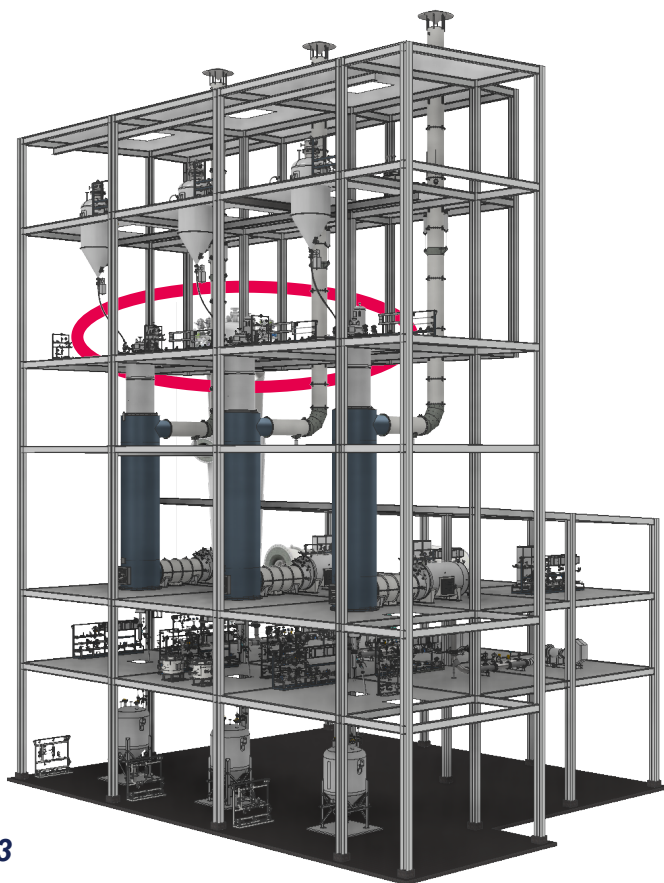
Catalyst Activation Process Subsystems



Catalyst Activation Process Subsystems



Catalyst Activation Process Subsystems



Emerson Automation Solutions

DELTA V™

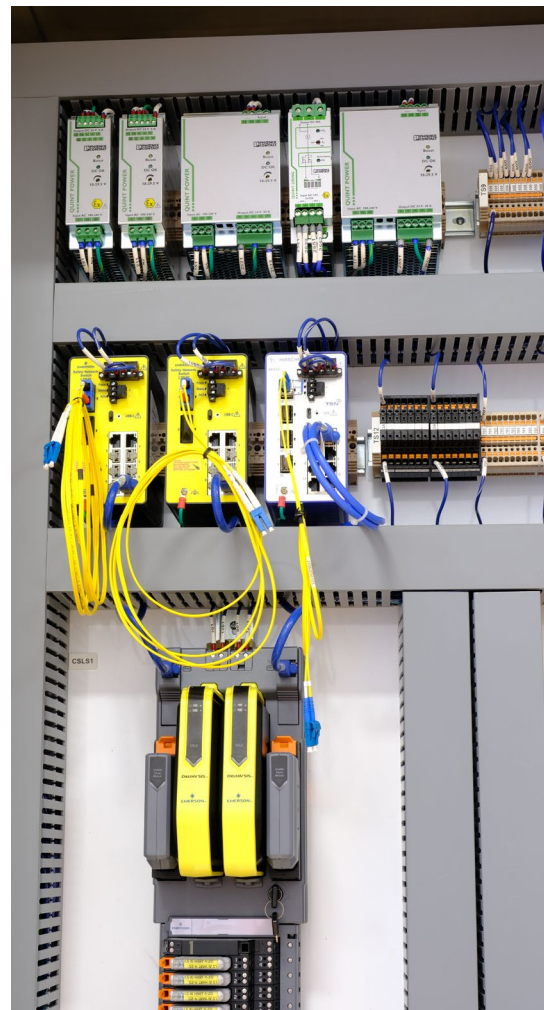
FISHER™

CROSBY™
ANDERSON GREENWOOD™


ROSEMOUNT™

MICRO MOTION™

Process Subsystems



Challenges, Solutions & Keys to Success



CRITICAL PROJECT SCHEDULE

CHALLENGE

- Tight timelines and milestones

SOLUTIONS

- Standardization on Emerson Solutions
 - Safety systems, measurement, and final control solutions




SUPPLY CHAIN



COMPLEX ENGINEERING



INTEGRATION WITH BOP SYSTEMS



CRITICAL PROJECT SCHEDULE



SUPPLY CHAIN

CHALLENGE

- **Delays and availability of materials**
 - Availability for materials globally impacted delivery schedules
- **Complex Sourcing:**
 - Numerous components & vendors involved - potentially 30+ on project

SOLUTIONS


- Emerson Portfolio Standardization



COMPLEX ENGINEERING



INTEGRATION WITH BOP SYSTEMS



Q4 2000 Q1 2001
Sep Oct Nov Dec Jan Feb Mar Ap

CRITICAL PROJECT SCHEDULE



SUPPLY CHAIN



COMPLEX ENGINEERING

CHALLENGE

- Design and fabrication of Catalyst Activation Trains


SOLUTIONS

- Partnership with Lakeside
 - Critical project support and reduced learning curve



INTEGRATION WITH BOP SYSTEMS

Challenges, Solutions & Keys to Success



**CRITICAL
PROJECT
SCHEDULE**

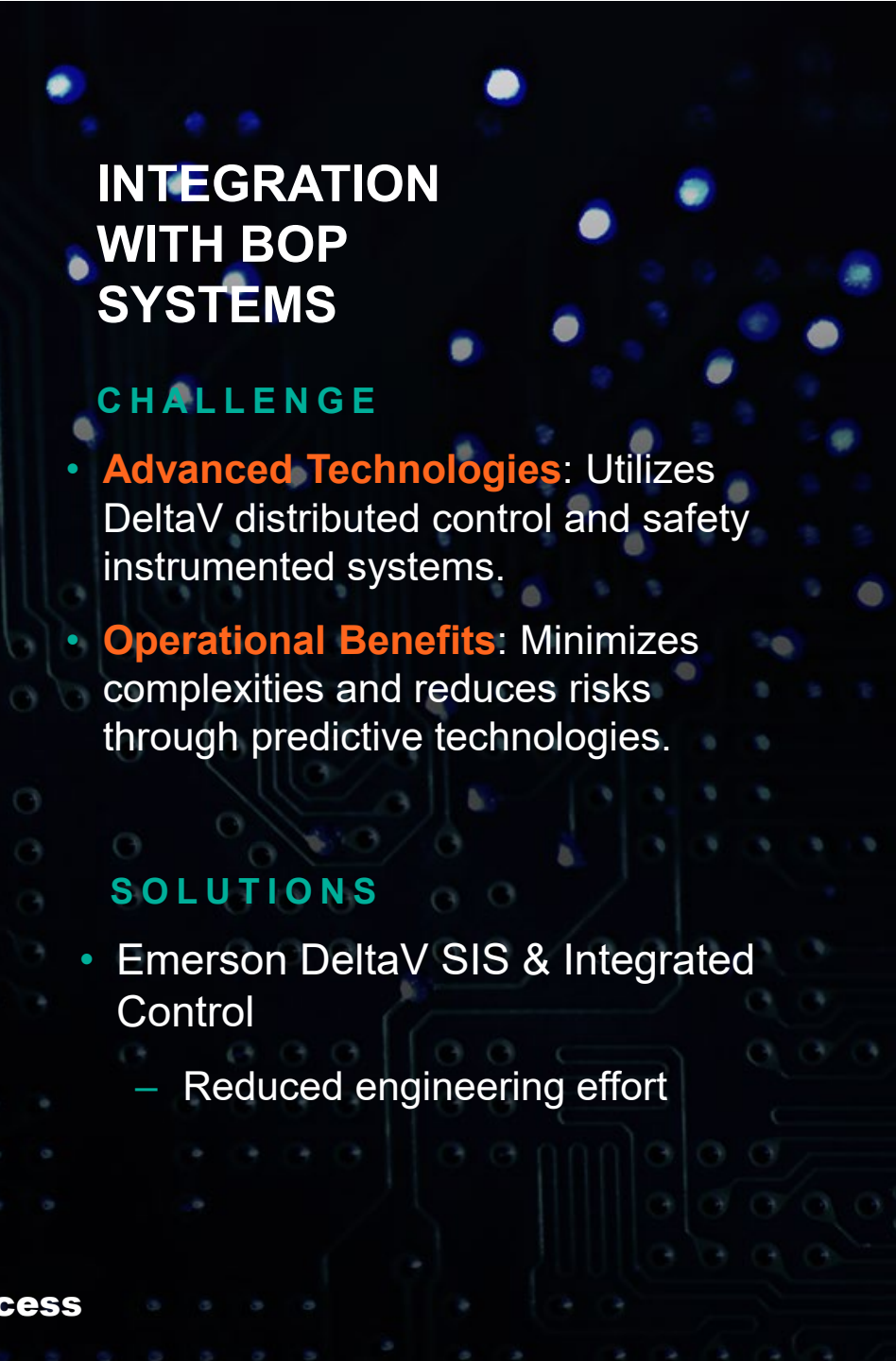


SUPPLY CHAIN



**COMPLEX
ENGINEERING**

Challenges, Solutions & Keys to Success



**INTEGRATION
WITH BOP
SYSTEMS**

CHALLENGE

- **Advanced Technologies:** Utilizes DeltaV distributed control and safety instrumented systems.
- **Operational Benefits:** Minimizes complexities and reduces risks through predictive technologies.

SOLUTIONS

- Emerson DeltaV SIS & Integrated Control
 - Reduced engineering effort

Results & Benefits



EFFICIENCY GAINS

- Reduction in engineering time and system integration by ~37%



COST SAVINGS

- Standardization leading to ~6% cost savings



PROJECT DELIVERY

- Completion within the contract schedule
- Moving from critical path to non-critical path
- Improved installation and construction scheduling



SUSTAINABILITY & ENVIRONMENTAL IMPACT

- Use of innovative emissions reduction technology
- Sustainable practices and technologies

Blueprint for Breakthroughs...

- **Summary:**
 - ✓ Project Significance: Significant economic and technological impact
 - ✓ Standardization on advanced Emerson Process Automation Solutions & Innovations.

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Lessons for Success

Importance of Collaboration:

- Essential for successful execution of complex engineering projects.
- Strong partnerships and open communication

Role of Innovation:

- Drives efficiency, reduces costs, and enhances project quality.
- Continuous investment in R&D is crucial.



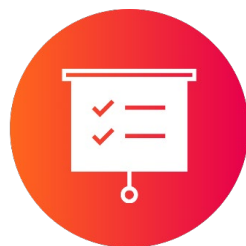
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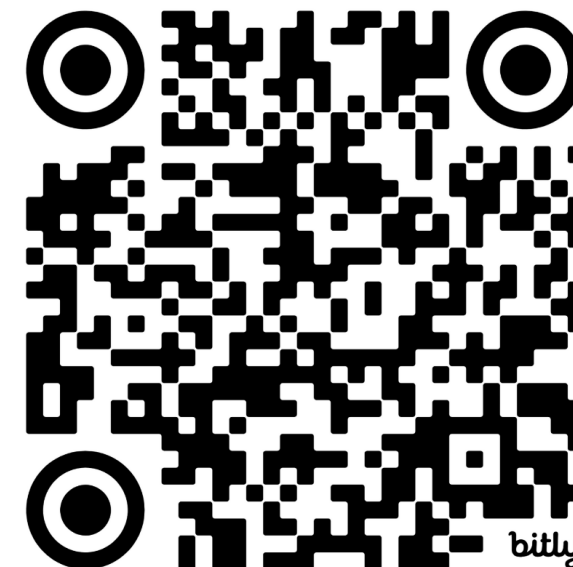


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Abstracts & Topics



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