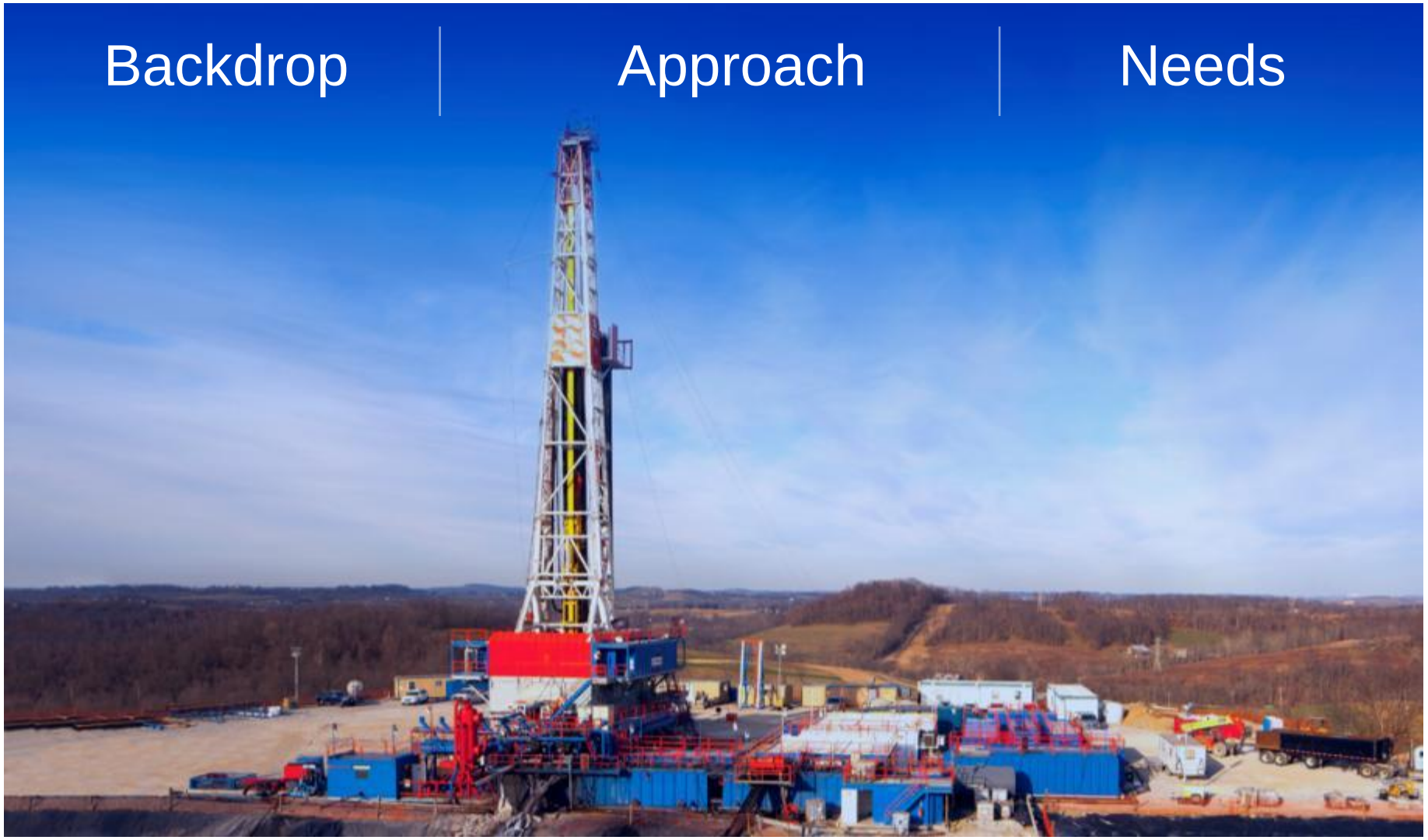
Process Safety Management in Upstream and Gas

Chevron

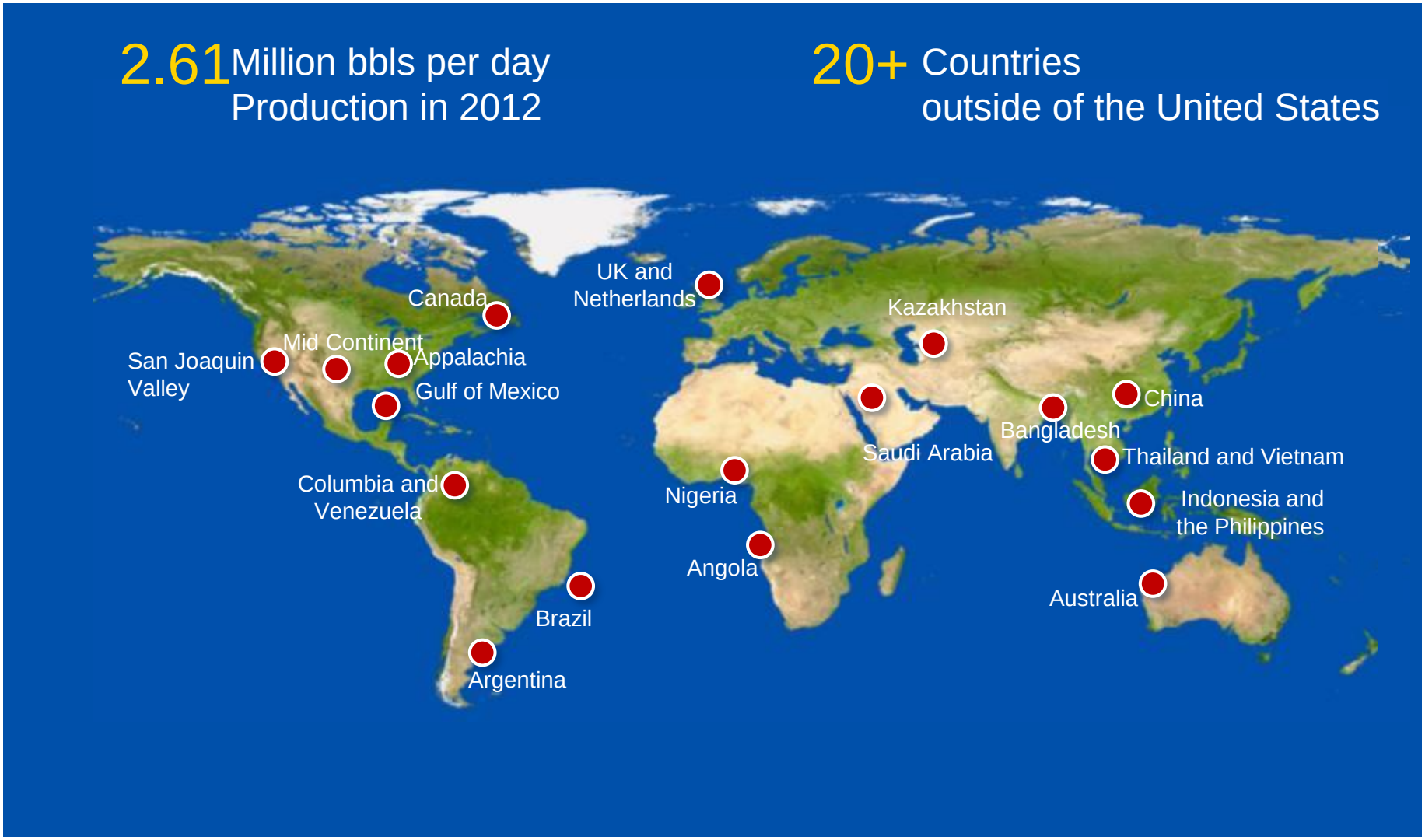
Human Energy®

AIChE/SACHE 2014 Faculty Workshop

Areas of Discussion



Backdrop: Geographic Diversity



Operational Diversity




Growth

Continued Development of Existing Production

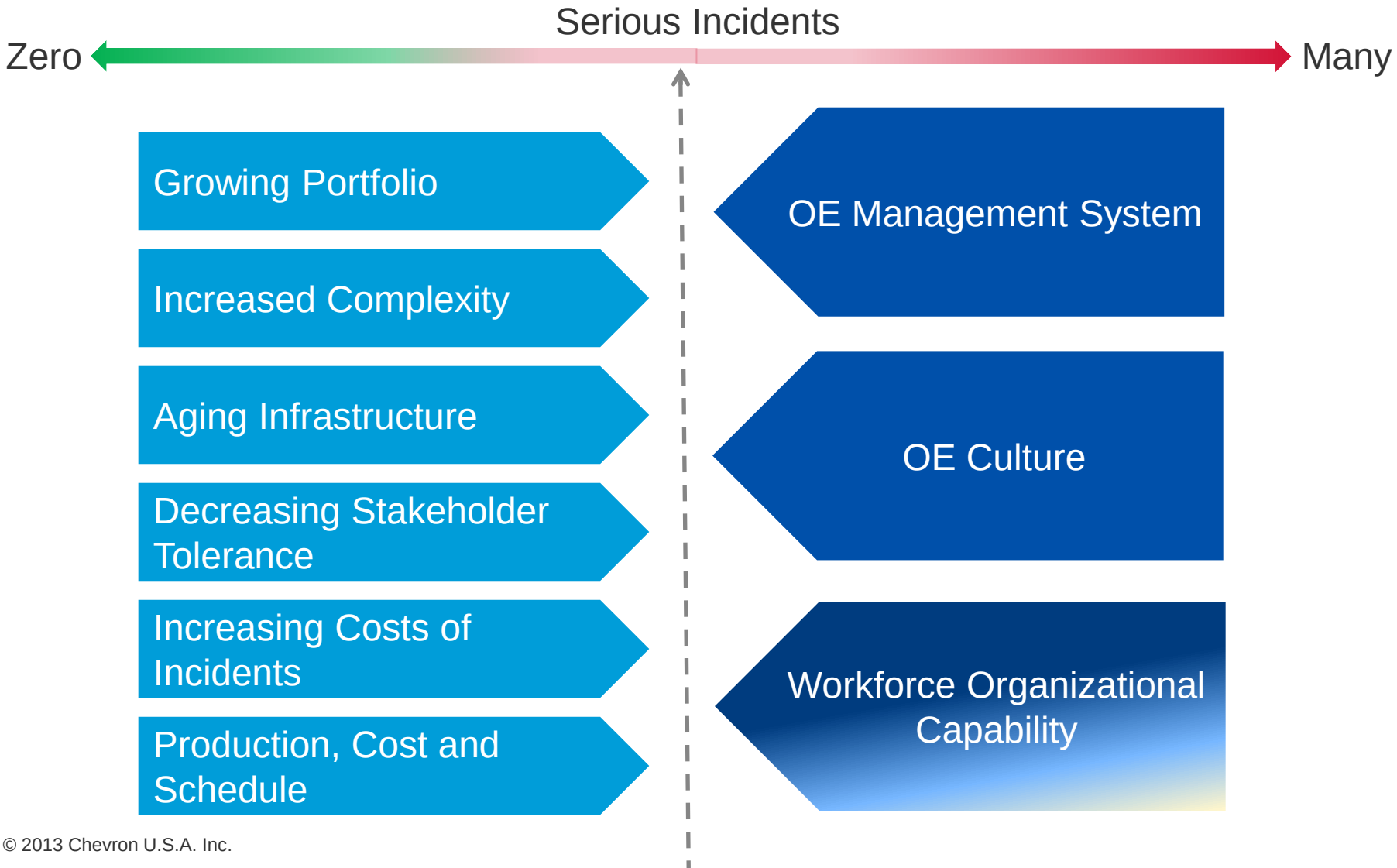
- Reliability and efficiency improvement
- Enhanced recovery
- Expanded production

New Development Areas and Opportunities

- Deepwater
- LNG
- Sour gas
- Shale gas
- Gas to liquids
- Oil sands

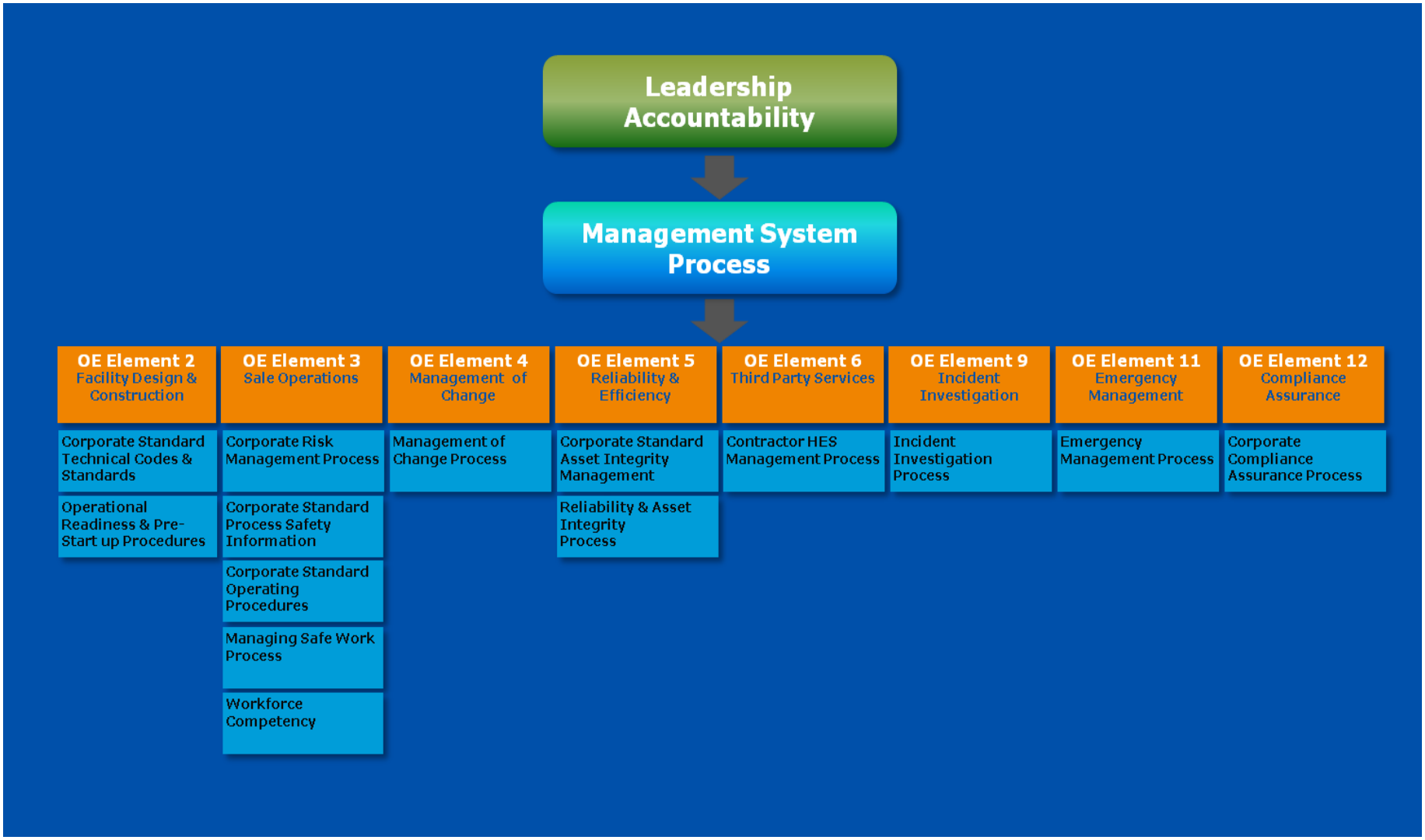
OE Equation

Potential for occurrence of a high impact incident in our expanding, complex portfolio is mitigated by our OEMS,OE culture and workforce OC

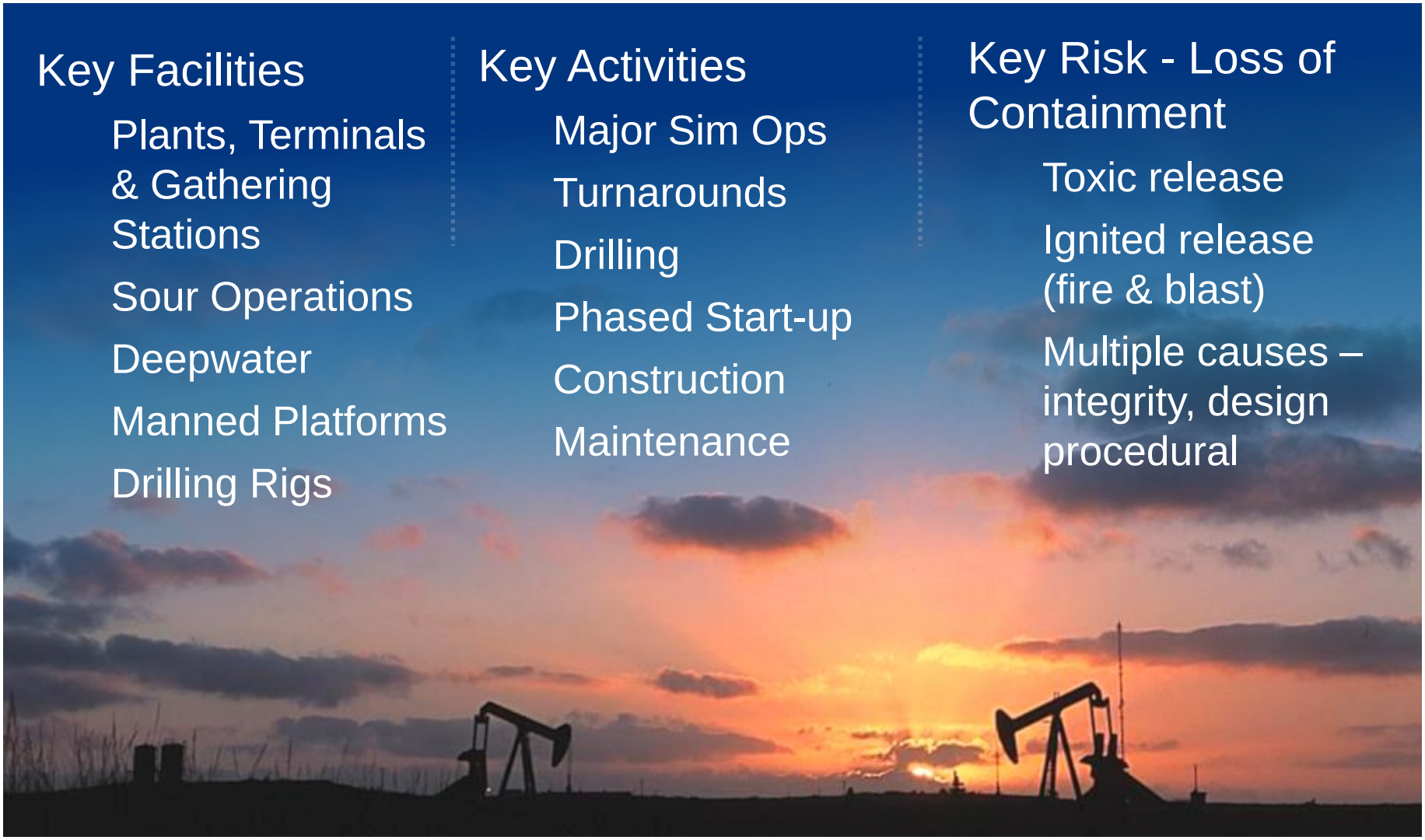


Approach to Applying Process Safety Management

Standardize



Prioritize



Key Facilities

- Plants, Terminals & Gathering Stations
- Sour Operations
- Deepwater
- Manned Platforms
- Drilling Rigs

Key Activities

- Major Sim Ops
- Turnarounds
- Drilling
- Phased Start-up
- Construction
- Maintenance

Key Risk - Loss of Containment

- Toxic release
- Ignited release (fire & blast)
- Multiple causes – integrity, design procedural

Apply to Projects

Concept Selection

- Siting
- Technology selection
- Inherently safer concepts

Engineering

- Inherently safer design
- Human factors
- Risk assessment
- Engineering standards
- Material selection
- Design assurance
- Technical authority

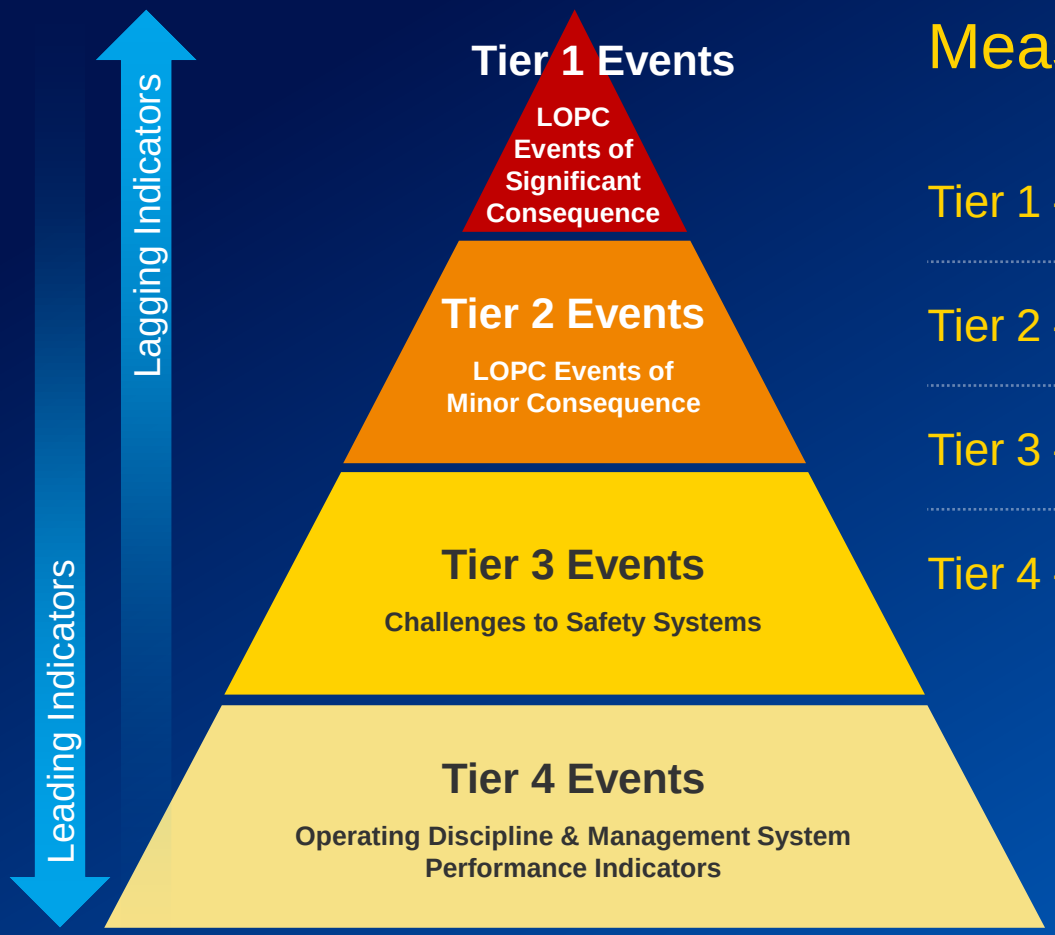
Construction

- Materials verification
- Inspection and quality control
- Management of change
- Management of PSI

Preparing for Operations

- Procedures
- Operational readiness and PSSR
- Organizational readiness
- Operator training
- Operator representation

Measure



Measurement

Tier 1 – Significant LOPC events

Tier 2 – Events of Lesser Consequence

Tier 3 – Challenges to Safety Systems

Tier 4 – Management System Indicators

Verify

Safeguard Stewardship

- Building process safety fluency at all levels of operations and engineering
- Helping leaders understand where to focus and what questions to ask
- Understanding and verifying critical safeguards
- Field hazard recognition
- Building a more formalized verification system – compliance assurance

Audit

- Improving audit and assurance at all levels
  - Audits are both a critical verification step and improvement opportunity

Needs

Competency of engineers in Process Safety

- Process safety competencies are needed in new hire engineers - need is not limited to Chemical Engineers
- Instill a sense of vulnerability

Research that addresses business needs

- Inherently safer technologies
- Improved understanding of risk
- Incident learning and Information Management