

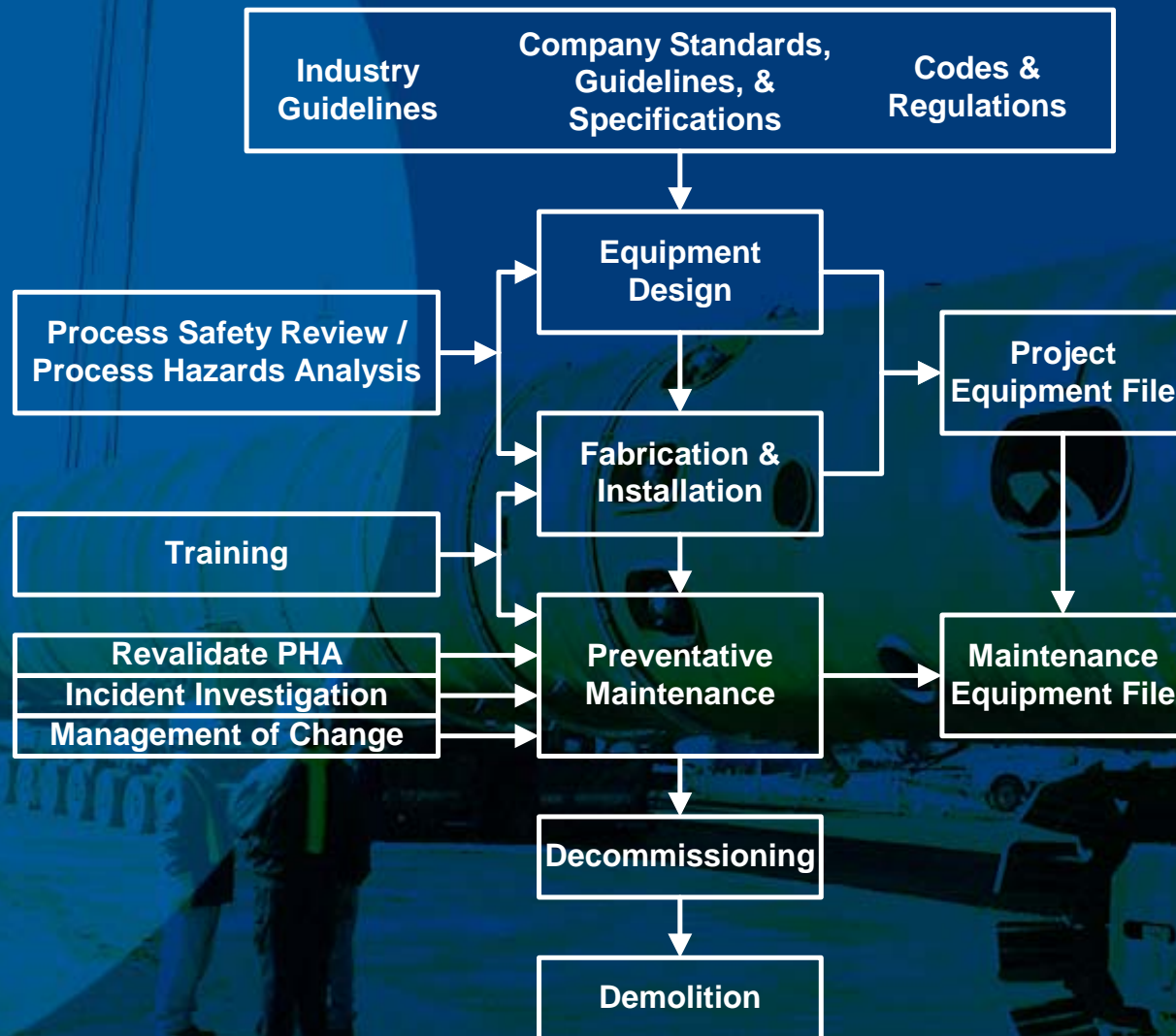
**55th Canadian Chemical Engineering Conference
Process Safety Loss Management Symposium
Lessons Learned and Risk Control Session**

Fitness-for-Service and Its Role in Mechanical Integrity: An Essential of PSM

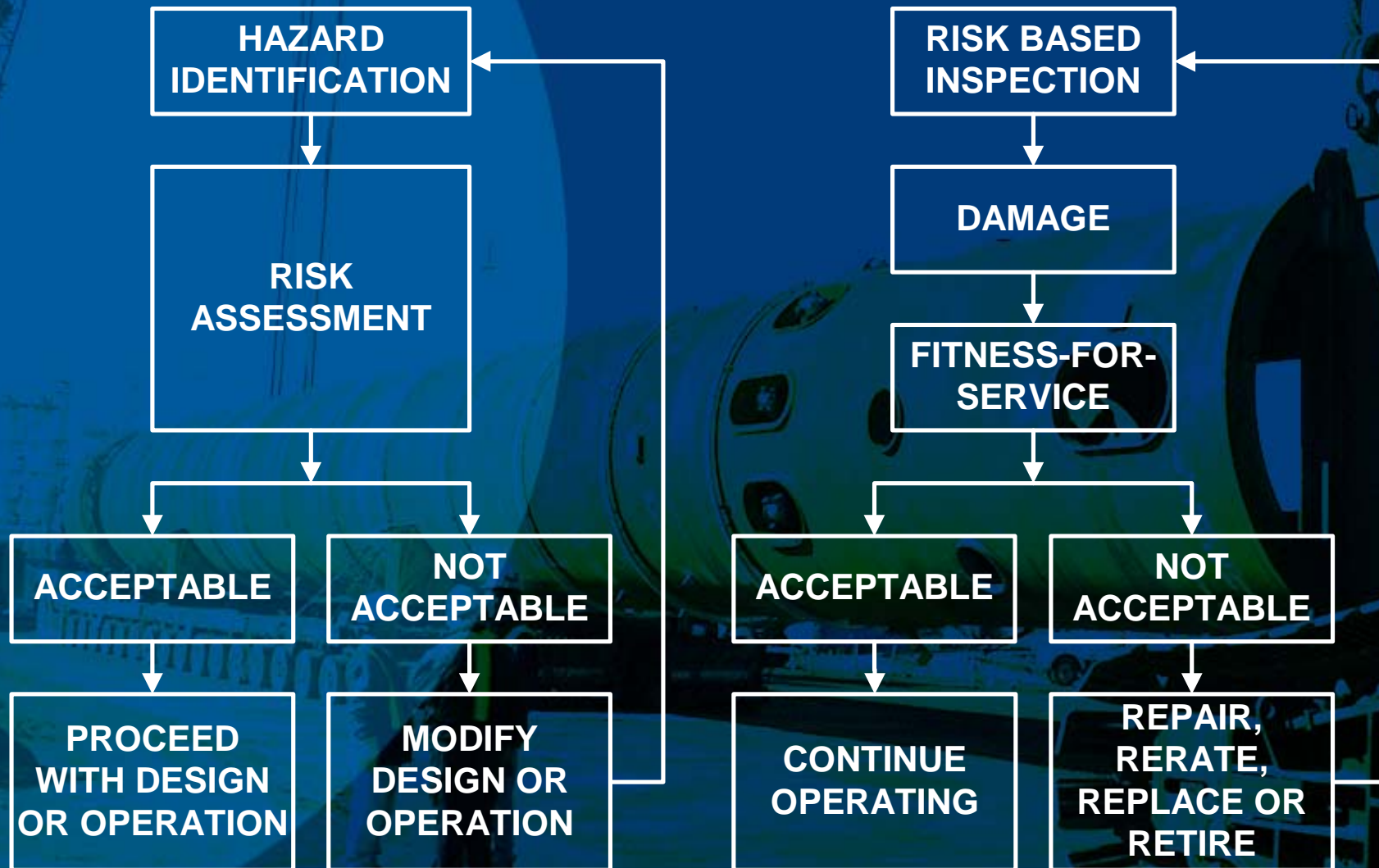
**October 19, 2005
Toronto, Ontario, Canada**

**Alister Chieng, P.Eng., Mark Dejmek, Shiju George, P.Eng.,
Trevor Seipp, M.Sc., P.Eng.**

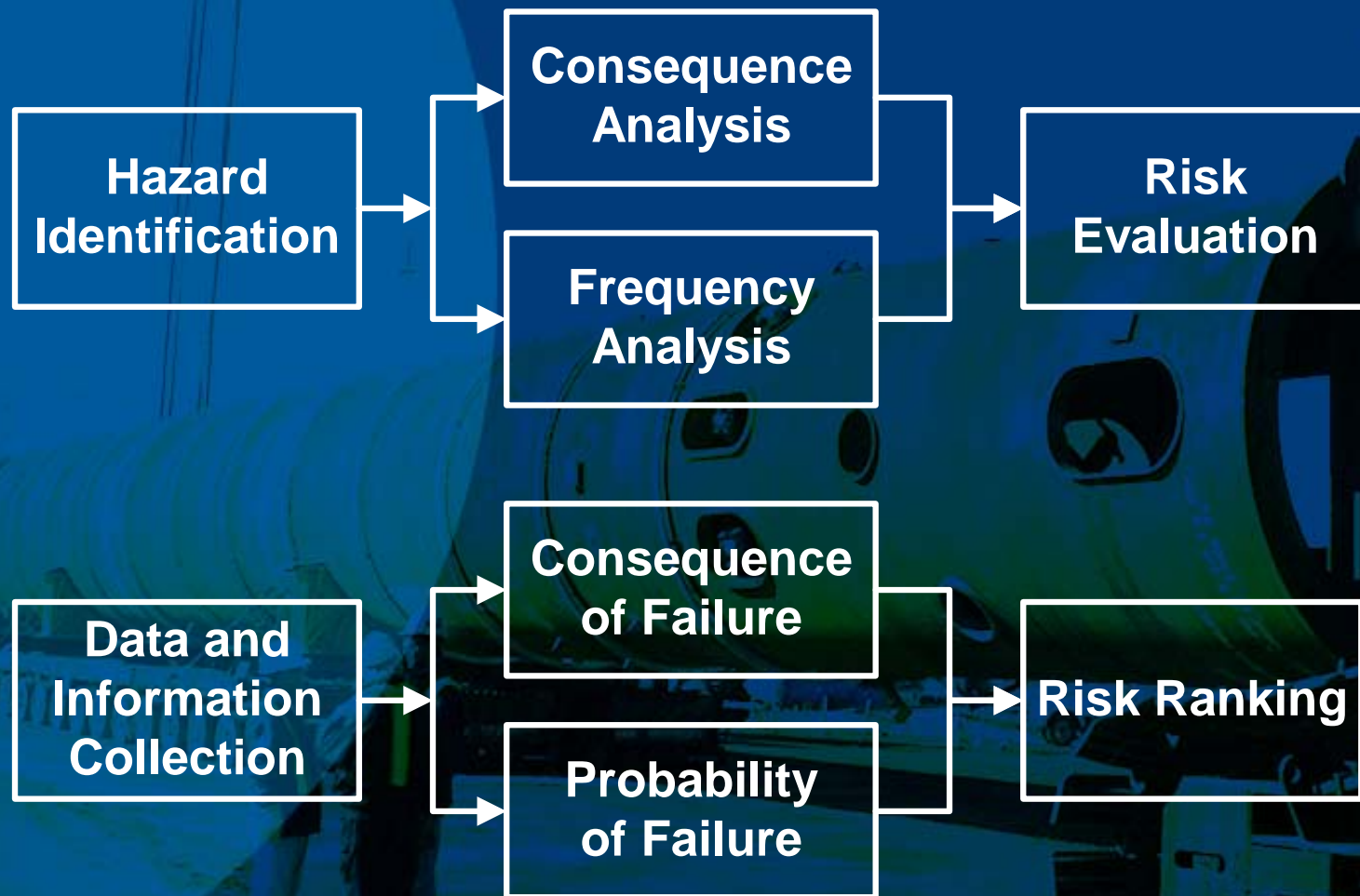
Process Equipment Integrity



Hazard Evaluation



Risk Assessment



Damage Mechanism

- Crack-like flaws
- Shell distortions and weld misalignments
- Blisters and laminations
- Pitting corrosion
- Local metal loss (corrosion/erosion)
- General metal loss

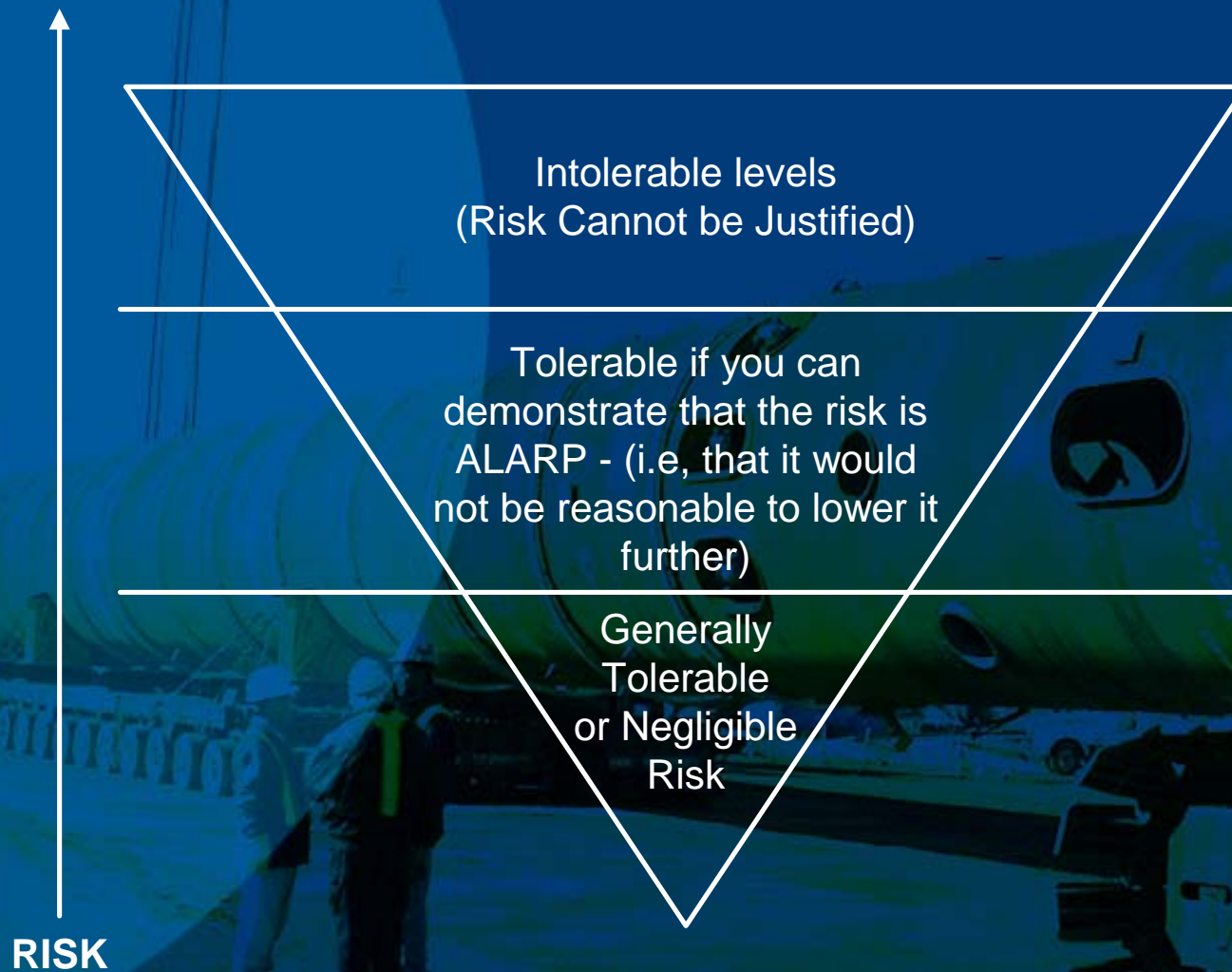
Mechanical Fitness-for-Service

- “...can be used to make run-repair-replace decisions to help ensure that pressurized equipment containing flaws which have been identified by inspection can continue to operate safely.”
- Uses industry standard methodologies
- Uses industry standard safety factors

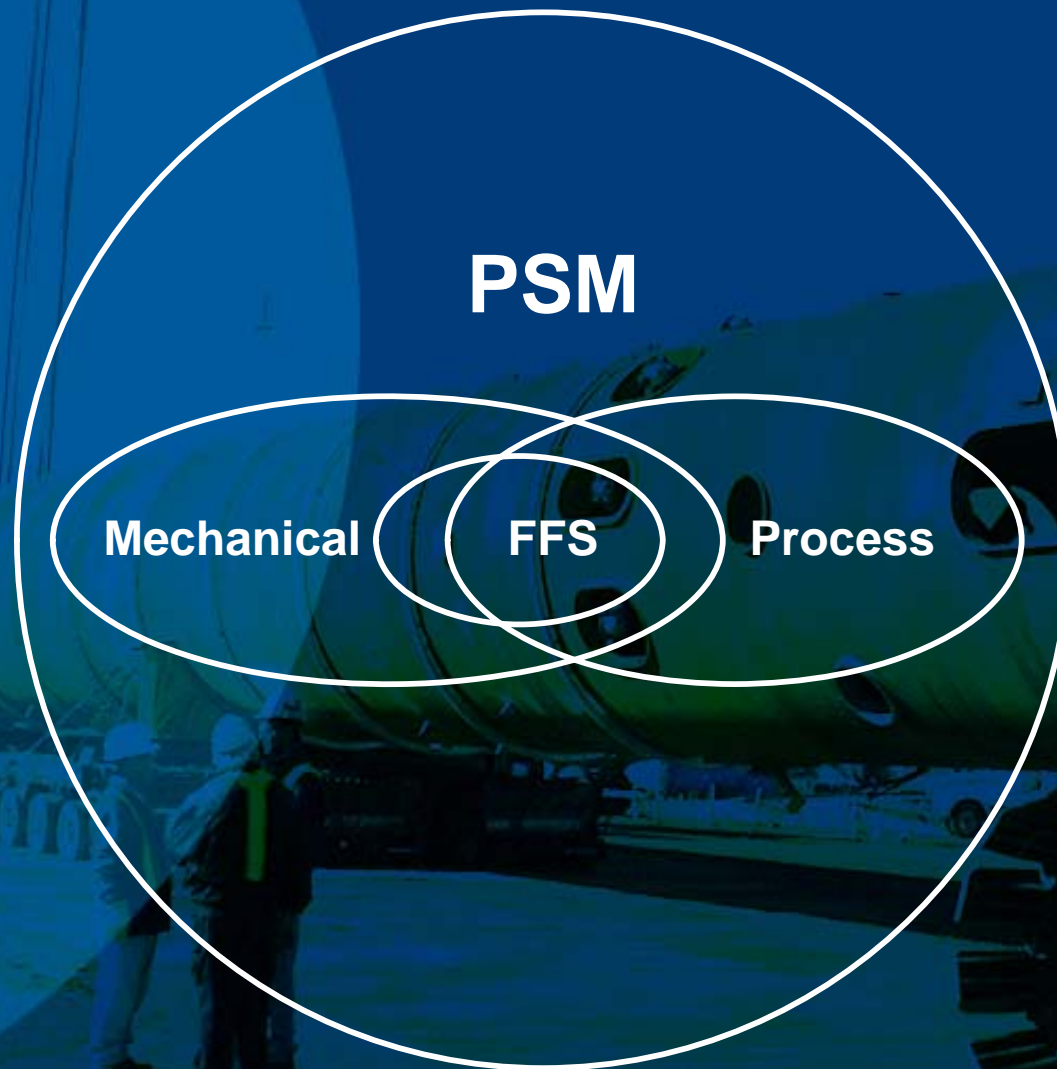
Industry Standards

- **Standard safety factors (design margins)**
- **ASME Boiler & Pressure Vessel Code**
 - Section VIII, Divisions 1 & 2
- **ASME Piping Codes**
 - B31.1, B31.3
- **API RP-579 “Fitness-for-Service”**

Risk Tolerability - ALARP



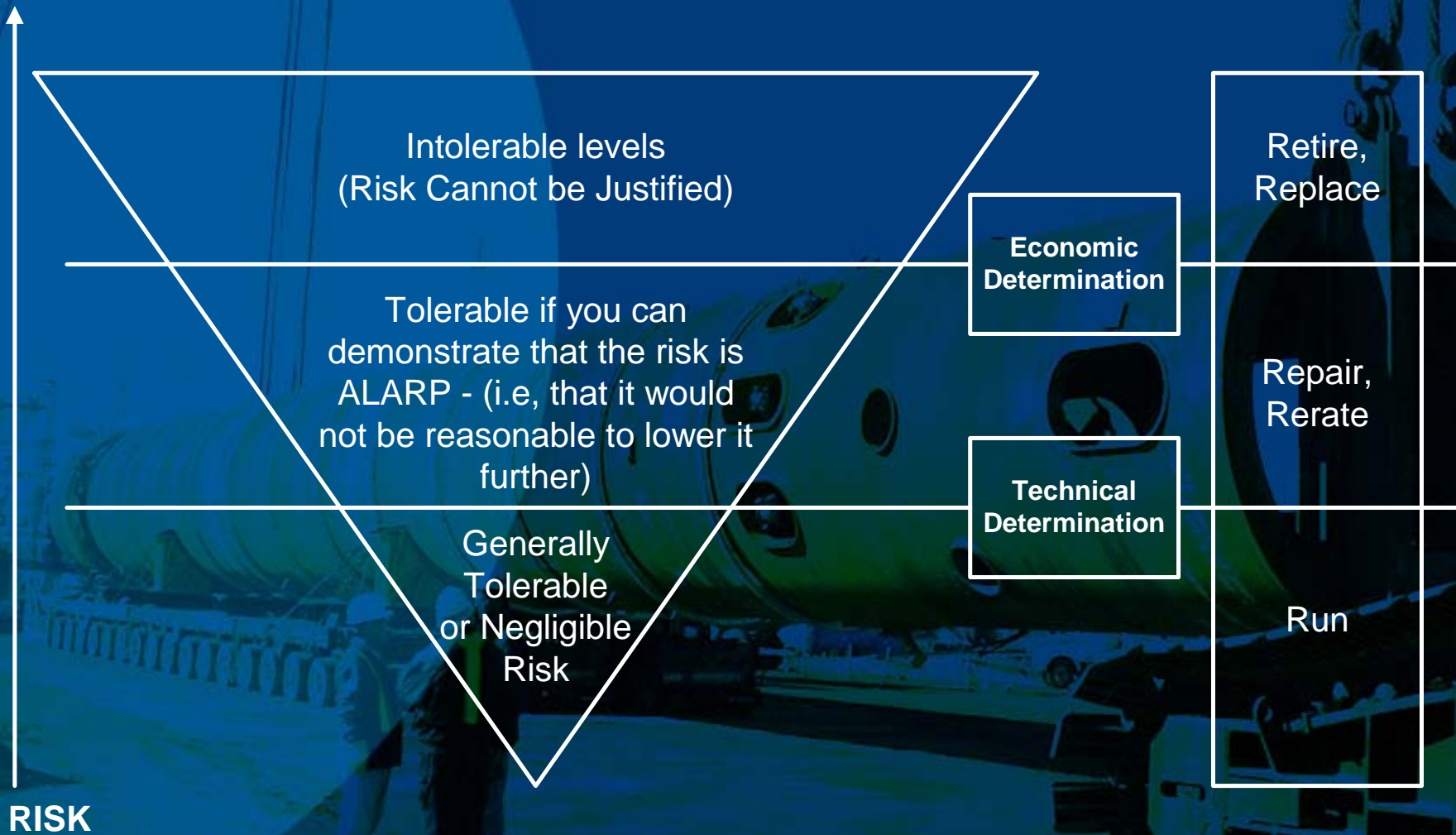
Mechanical & Process Integration



Mechanical & Process Integration

- **Mechanical needs:**
 - Operational history of equipment
- **Mechanical and Process develop:**
 - Criteria for acceptability
- **Inter-disciplinary communication vital**
- **High skill level for FFS evaluations:**
 - Plant personnel
 - Consultants

Run, Repair, Replace



Summary

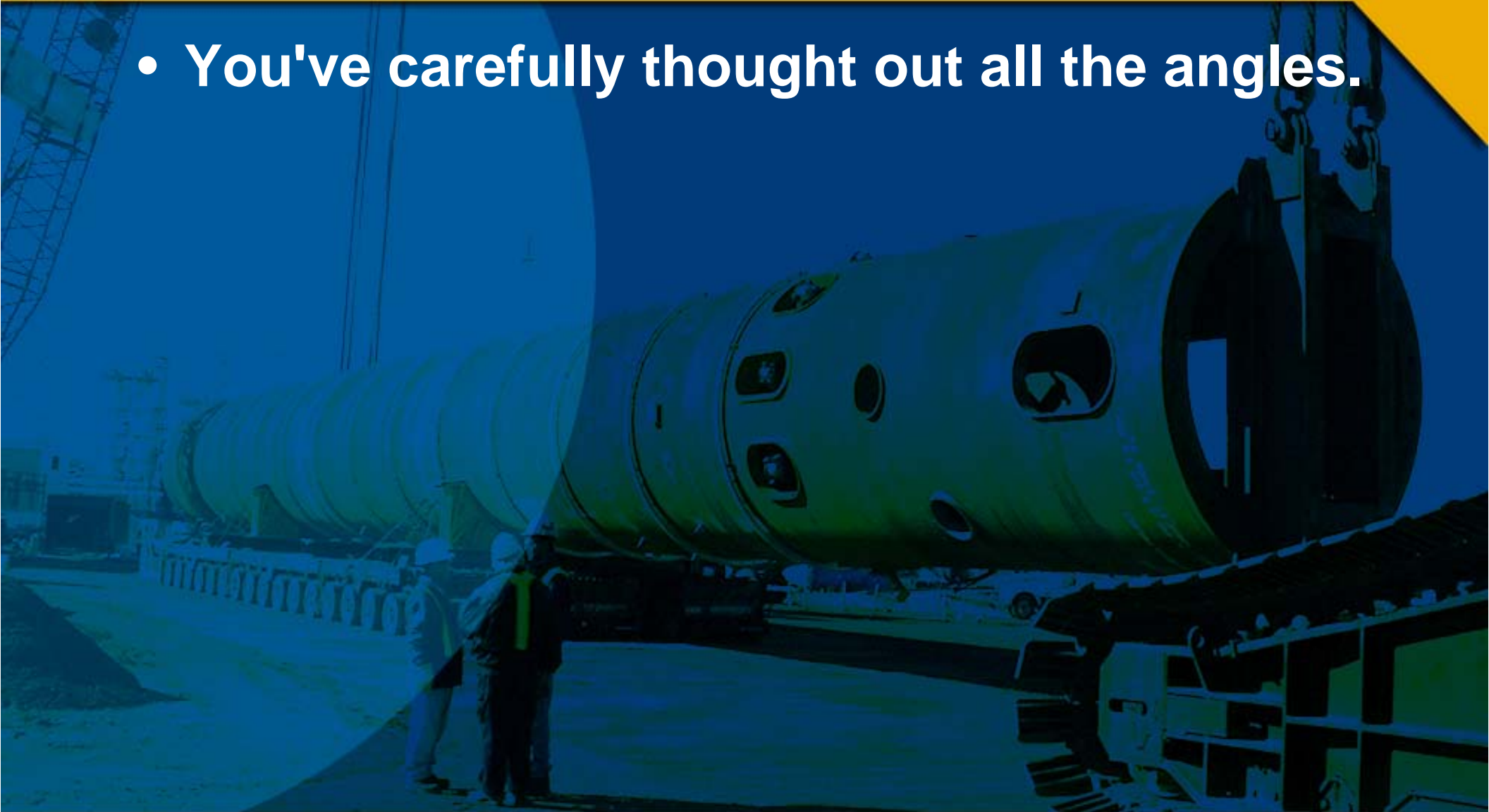
- Process Equipment Integrity
- Hazard Evaluation
- Risk Assessment
- Damage Mechanism
- Mechanical FFS
- Industry Standards
- Risk Tolerability
- Mechanical and Process Integration
- Run, Repair, Replace

Summary



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- You know what you're doing, its what you've been trained to do your whole life.

Summary

- You've carefully thought out all the angles.
- You've done it a thousand times.
- It comes naturally to you.
- You know what you're doing, its what you've been trained to do your whole life.
- Nothing could possibly go wrong, right ?

Summary



Any Questions?

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