

# Integrating Process Safety in Engineering Project - Best Practices

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# Focus Area



Process Safety and its integration



Process Incidents



Types of Projects and its Life-cycle



Why is integration required?



Nayara Energy's approach



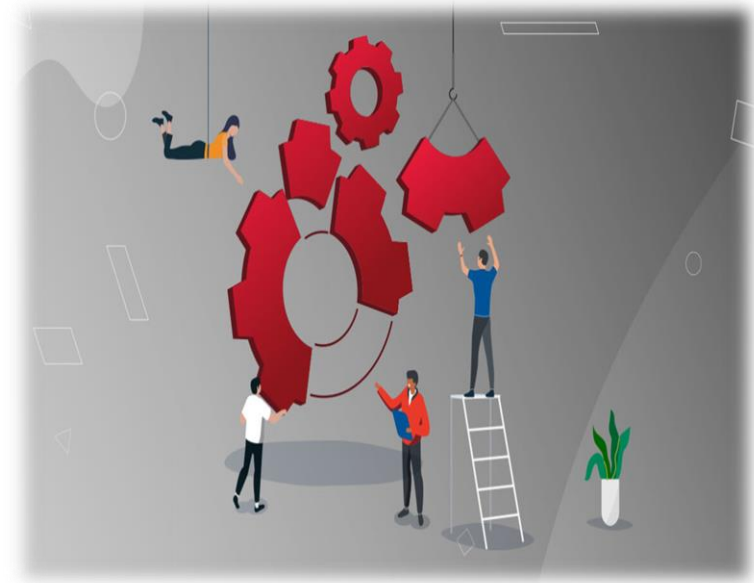
Conclusion

# Process Safety:

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Process Safety is a systematic way (identify, evaluate, and mitigate the process risk) to manage the Process systems and assets to ensure that it will operate as per the design intent, without impacting Human, Environment and Assets.

Process safety helps to manage highly hazardous materials and energy to prevent catastrophic events.



# Process Safety integration:

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Process Safety incidents often originate from poor design decisions made early in a project. Once a facility is built, correcting these issues becomes expensive or nearly impossible.

Integrating process safety from the beginning ensures that risks are eliminated or minimized **by design**—the most effective and sustainable approach.



# Process Safety Incidents:

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Process Safety incident is an unplanned or uncontrolled release of any material, energy, or substance (including toxic, flammable, reactive, or high-pressure materials) from a process that could cause harm to **People, Environment, Assets and Reputation** of the organisation.



# Engineering Projects:

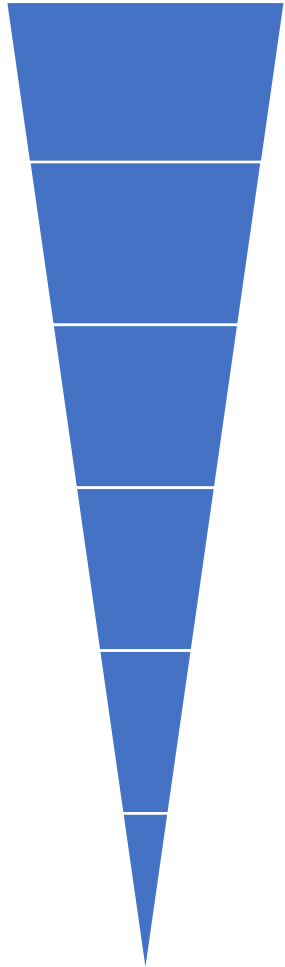
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- Green field, Brown field & Debottleneck
- Indoor & Outdoor, Onshore & Offshore
- Major Modifications (covered by MOC)
- Loading and offloading systems
- Control systems
- Utility systems
- Buildings
- Pipelines, etc.



# Project Life Cycle:

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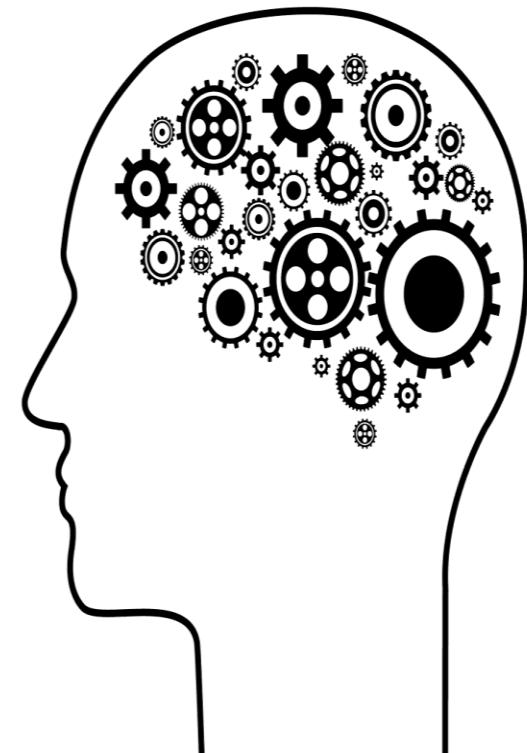


- Concept or Feasibility Stage
- Basic Design Engineering Package
- Front End Engineering Design
- Detailed Engineering
- Construction
- Pre-commissioning & Commissioning
- Handover to Operations

# Integration Objective:

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- Inherently safer design (ISD)
- Identification of high risks
- Statutory and Regulatory compliance
- Late stage design changes
- Project reliability, operability and efficiency
- Reduce the like hood and severity of catastrophic releases
- Reduce risk to the People, Environment, Assets and Reputation



# How to integrate:

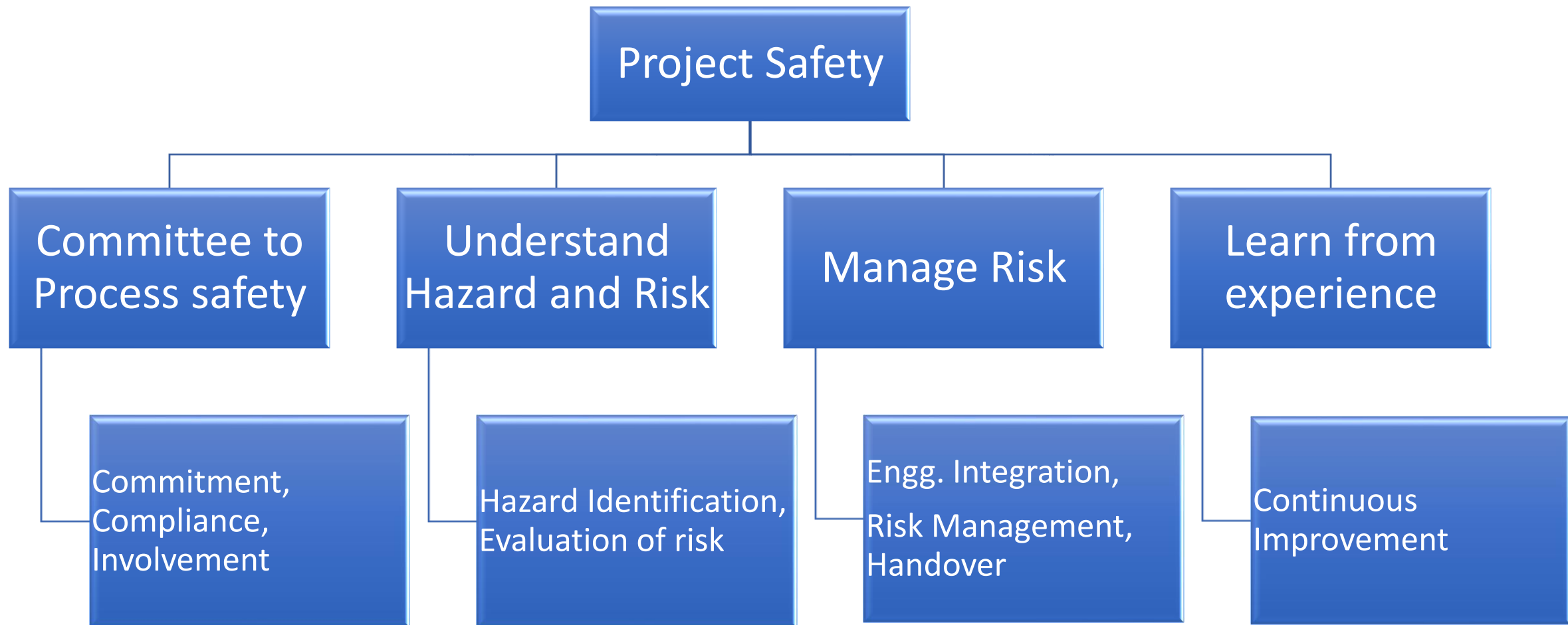
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- Stage of the Project
- Integrate with engineering
- Integrate with the compliances
- Integrate with Contractors
- Integration the Leadership
- Manage the Changes
- Handover
- Continuous improvement



# How Nayara's integration is ?

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# Commitment:

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- ✓ Ownership and Key responsibilities
- ✓ Competency and culture
- ✓ Safety prioritized over cost and schedule
- ✓ Contractors engagement & commitment



# Compliances:

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- ✓ Develop compliance register
- ✓ Monitoring & Audit
- ✓ Incorporate requirements in Design Basis
- ✓ Early plan and timely approvals





# Stage of the Project:

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- ✓ Include early process safety experts from project inception
- ✓ Inherently Safer Design (ISD) approach
- ✓ Develop risk acceptance criteria's and risk matrix
- ✓ Conduct Process Hazard identification and evaluation
- ✓ Develop the safety design and philosophy documents
- ✓ Develop and maintain Safety deliverables



# Integrate with Engineering:

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- ✓ Process design
- ✓ Mechanical design
- ✓ Electrical
- ✓ Instrumentation
- ✓ Civil & layout design
- ✓ Safety system designs
- ✓ Avoid retrofiting safety at later stages



# Risk Management

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- ✓ Identification and mitigation of construction risks
- ✓ Identification and mitigation of Precom and Comm. risk
- ✓ Verification of all installation by SME's before PSSR
- ✓ Compliance of MOC process during projects
- ✓ Compliance of ERP
- ✓ Pre-Startup Safety Review (PSSR) compliance
- ✓ Review and verification of PSI documents
- ✓ Develop or follow the SOP and SWP



# Handover:

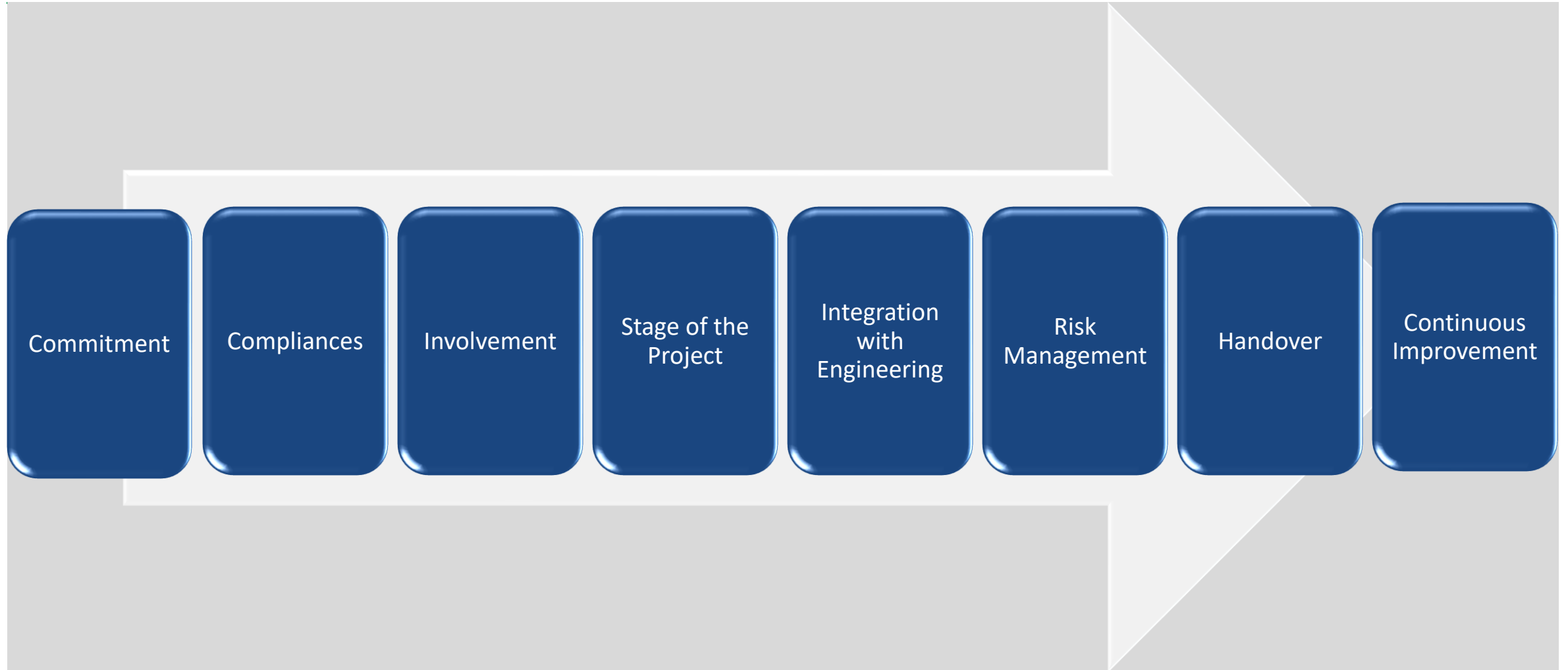
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- ✓ Maintain updated PSI's and safety studies
- ✓ Handover complete safety documentation
- ✓ Ensure operations understand design intent
- ✓ Preserve lessons learned for future projects





# Recap:



# Conclusion:

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- ✓ Management commitment is essential
- ✓ Early integration is key to success
- ✓ Process safety must be part of engineering design
- ✓ Safety-driven projects are sustainable projects
- ✓ Develop a procedure for Process safety integration

*“Accidents are not caused by a lack of knowledge,  
but by a failure to use the knowledge,  
that is available”.*

*Dr. Trevor Kletz*



Source:

NEW ERA OF  
**INFINITE POSSIBILITIES**

***Thank You All***



NEW ERA OF  
**INFINITE POSSIBILITIES**