


**Using HAZOP/LOPA Early
and Throughout the Design
Cycle to Accomplish Multiple
Design Objectives and
Reduce Project Costs**
(GCPS-2019 – Paper 548409)

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Presentation/Handout/Additional Resources – <http://www.RMPCorp.com/Events-and-Resources/Conferences/GCPS/>

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Risk Management Professionals

- 39-Year Engineer – 35 in Process Safety Consulting Specializing in Hazard Analysis and QRA
- Mechanical Engineering
 - BS – Duke University
 - MS – Carnegie-Mellon University
- Professional Engineer – Mechanical & Chemical Engineering
- CCPS Technical Steering Committee – mid-1980s
- Past-President Southern CA Society for Risk Analysis
- Landmark Efforts
 - Platform Safety Shutdown System Effectiveness Study
 - Torrance Refinery Safety Advisor for MHF Conversion
- Paper & Book Publications – See www.RMPCorp.com



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Key Topics

- Design Objectives
- Design Cycle
- Resources
- Infusion of D-HAZOP/LOPA Into the Design Process
- Implementation During the Facility Life Cycle
- General D-HAZOP/LOPA Application Tips
- On-Budget, On-Schedule, & a Safer/More-Operable Facility
- Questions?




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Design Objectives Include Process Safety


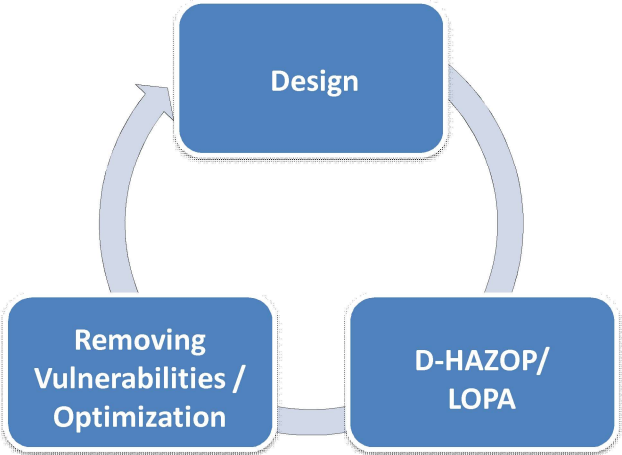


Tragedies to Avoid

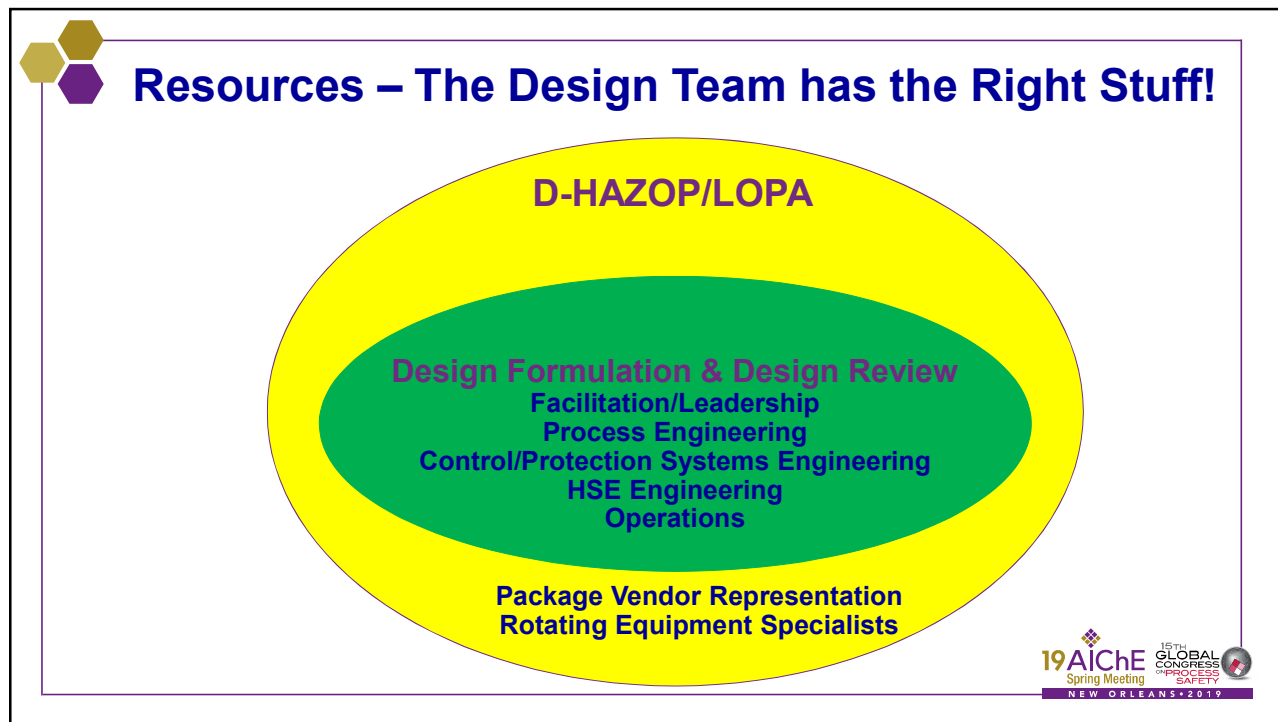


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PHA (D-HAZOP/LOPA) Must be a Key Element of the Design Cycle



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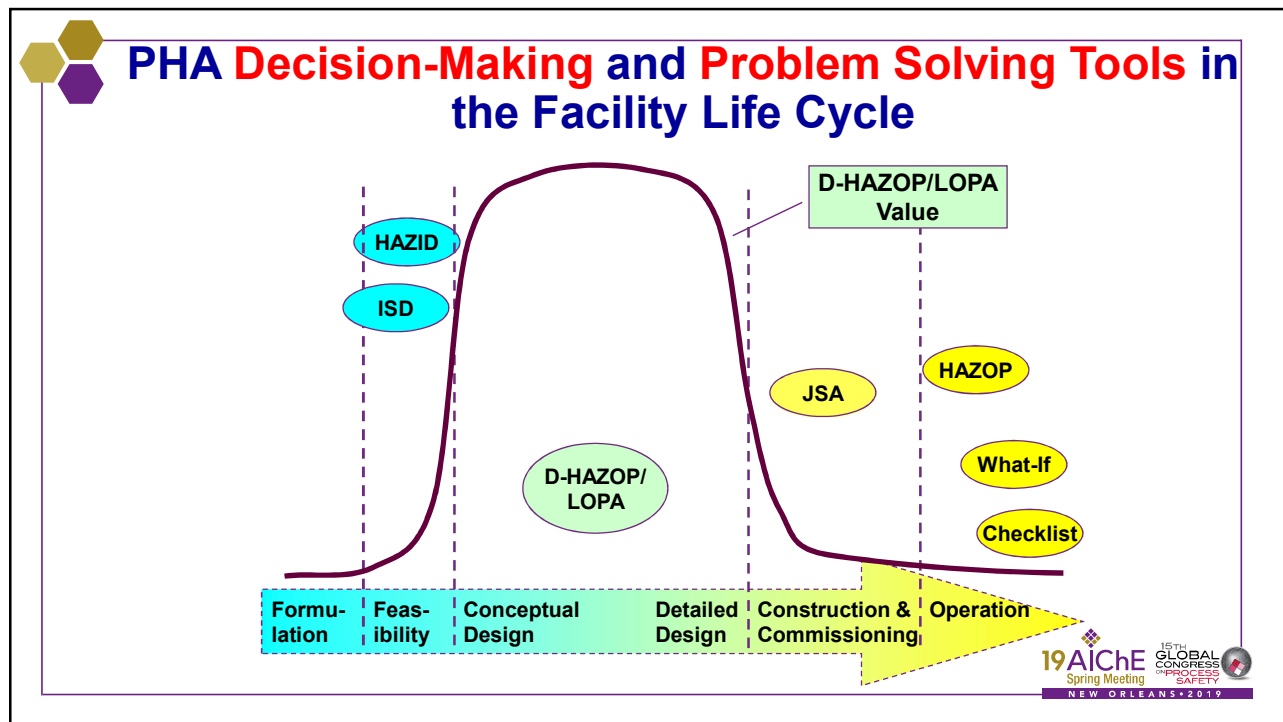
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Infusion of D-HAZOP/LOPA Into the Design Process

- Given the fundamental importance of PHA to plant safety and operability, the question isn't should it play a role during the design process, but how can the design process be effective and efficient without it?
- Although **safety** is on everyone's list, **D-HAZOP/LOPA** is a platform that can address key project objectives for all stakeholders!
- The challenge is getting as much as value as possible from **D-HAZOP/LOPA** implementation.

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D-HAZOP/LOPA Application Quick Tips

- Preparation
- Session Time
- Documentation
- Handling Large Numbers of Action Items
- Design Segregation Issues
- Vendor Issues
- Availability of Design Information
- Handling Challenges During the Design Process
- Maximizing Future Usefulness
- Quality Assurance Review




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On-Budget, On-Schedule, & a Safer/More-Operable Facility

- **Project Control**
 - **D-HAZOP/LOPA Provides a Different Perspective to the Design – Flush Out Big Issues Early**
 - **Forces Completion of Efforts**
 - **Forces Resolution of Information Bottlenecks**
 - **Drives Anticipation of Design Deficiencies from Unforeseen Hazards**
 - **Neutralizes the “I’m waiting for ...” Syndrome**
- **Maintain Project Schedules**
- **Maintain Project Budget**
- **Teamwork** – Puts Issues in Perspective and Provides Forum for Resolving Design Disputes

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Questions?

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