

Megan L. Hoppe Senior Engineer, Kenexis

Fields of Competence

Process Hazards Analysis (PHA)
Safety Instrumented System (SIS) Engineering
Layer of Protection Analysis (LOPA)
Safety Integrity Level (SIL) Selection
Safety Integrity Level Verification
Quantitative Risk Assessment (QRA)
Fault Tree Analysis (FTA)
Functional Test Plan Development
Safety Requirement Specifications (SRS)
Fire & Gas System (FGS) Design Basis and Mapping
Dispersion Modeling

Experience Summary

Ms. Hoppe is a Senior Engineer with Kenexis, responsible for engineered safeguard design basis development and verification / validation projects. In her current position she has experience with numerous SIS implementation and risk analysis projects for a variety of process plants in diverse world-wide locations. Ms. Hoppe is also proficient in performance-based FGS design, including risk-based techniques for FGS integrity analysis and fire and gas detector mapping techniques.

Credentials

Master of Business Administration (MBA), The Ohio State University, 2019

B.S, Chemical Engineering, The Ohio State University, 2013

ISA / IEC 61511 Expert

Qualified on Safety Instrumented System – Front End Engineering Design Part 1 and Part 2

Completed Kenexis Fire and Gas System Design Training

Completed Kenexis Burner Management System Training

Affiliations

International Society of Automation (ISA)
Local Section Officer
2013 – Present

Key Assignments

Ms. Hoppe has partaken in several PHAs and LOPAs to determine basis of design for Safety Instrumented Systems. SIS design projects include definition of Safety Instrumented Functions (SIF), risk analysis to determine SIL, conceptual design evaluation, SIL verification, and functional test plan development. Clients range from upstream oil and gas, downstream refining, petrochemicals, and smaller process related industries.

Unit Type Experience

- Oil and Gas Production Onshore / Offshore
- Liquefied Natural Gas (LNG)
- Fired Heaters
- Coke Drums
- Crude / Crude Vac
- Amine Treating / Sulfur Recovery (SRU)
- Glycol Utility Systems and Regeneration
- Waste Heat Recovery
- Hydrotreating / Hydrocracking
- Fluidized Catalytic Cracking (FCC)
- Mercury Recovery Unit
- Polymerization Reactors
- Regenerative Thermal Oxidizers
- Utility Boilers
- Compressor Systems
- Electrostatic Precipitators

Participated in a number of SIL selection meetings for a variety of refinery capital projects, including a three cell coker charge heater, a hot oil heater upgrade, two new coke drums and their corresponding interlocks, a flare system upgrade, a gas desulfurization unit upgrade, an FCC slide valve upgrade, and multiple diverse unit refinery heaters. Additionally, Ms. Hoppe took part in SIL selection meetings for upstream oil and gas capital projects including the addition of new oil processing trains to an existing facility in the middle east and a two-week, full facility SIL Selection for a new offshore platform to be located in the Gulf of Mexico. Ms. Hoppe has also been involved in numerous PHA revalidations including a five-week study for an existing offshore platform in the Gulf of Thailand, a month-long study for two Sulfur Recovery Units at a Texas Refinery, and a two-week study for a refinery flare system.

Developed SIS Design Basis information for numerous units / processes. Conceptual design evaluation and SIL verification have been completed for a new installation coker charge heater, a steam to hydrocarbon ratio controller, utility boilers, regenerative thermal oxidizers,

Key Assignments - Continued

a SIS system upgrade for a fractionation unit, an SRU upgrade, multiple refinery heaters, a FCC catalytic oxidizer, and the entirety of both a new offshore platform and a new surfactant plant. Ms. Hoppe has also participated in the plant wide consolidation, optimization, and verification of an LNG plant in the Caribbean. This included selection of appropriate failure data to characterize equipment failure frequencies, calculation of achieved RRF and SIL, and development of recommendations to modify SIS design and / or maintenance frequency to achieve desired SIL targets on systems not meeting their requirements. Ms. Hoppe has also performed detailed QRAs using fault tree for overflow and gas blowby / overpressure scenarios for a combination hydrocracker / hydrotreater unit, overflow and surge scenarios for suction drums and their corresponding compressors, overflow scenarios for coke drums and quench towers, overflow scenarios for a gas / oil hydrotreater, de-energization of an FCC electrostatic precipitator, hydrocracker runaway reaction scenarios, ion cyclotron heating I&C unavailability scenarios, and low temperature embrittlement scenarios for a depropanizer tower, overhead accumulator, and propane and NGL storage tanks.

Executed FGS design and validation for a LPG tank farm located in South America, a new production platform in the Gulf of Mexico, a combination light ends unit / hot oil heater and a alkylation tank farm at a refinery in Texas, a methane removal unit and fractionation unit in Ohio, an olefin compression platform in Louisiana, a gasoline pump station in India, two power generation facilities in Hong Kong, an onshore crude dehydration facility in Malaysia, an offshore platform in Abu Dhabi, and four offshore natural gas production platforms in Sarawak. These projects included dispersion modeling, hazard identification, design of the fire and gas system, and fire and gas detector coverage mapping analysis. Additionally, Ms. Hoppe had performed gas dispersion modeling to determine worker exposure potential for an oil and gas gathering system in Eastern Europe, a high-pressure gas pipeline at a pharmaceutical manufacturer, hydrogen dispersion for a chlorine rail car in Ohio, and benzene and natural gas vent locations for a refinery in Texas.

Participated in a pre-startup acceptance test and on-site creation of functional test plans for a fuel gas test cell; testing procedures were documented as they occurred for all SIF. Ms. Hoppe has also developed functional test plans and a safety requirements specification document for an entire fractionation unit located in West Virginia.