KENEXIS

Professional Profile

Lily R. Glick, PE
Senior Engineer, Kenexis

Fields of Competence

Dispersion Modeling
Process Hazards Analysis (PHA)
Hazards and Operability Analysis (HAZOP)
Layer of Protection Analysis (LOPA)
Safety Instrumented System (SIS) Engineering
Safety Integrity Level (SIL) Selection
Safety Integrity Level (SIL) Verification
Quantitative Risk Assessment (QRA)
Fire and Gas Mapping
Safety Requirement Specifications (SRS)
Fault Tree Analysis (FTA)

Experience Summary

Ms. Glick is a Senior Engineer at Kenexis with experience in Computational Fluid Dynamics (CFD) Gas Dispersion Modeling, Fire and Gas (FGS) Mapping, and Safety Instrumented Systems (SIS). She is involved in risk analysis projects for a variety of process plants. She has created extensive models of toxic and combustible gas releases in Fire Dynamics Simulator (FDS), OpenFOAM (open source CFD software), and PHAST. Ms. Glick is also proficient in performance based FGS design including gas detector mapping techniques. Ms. Glick is certified to lead Process Hazard Analyses (PHA) and has experience in numerous HAZOP and Layer of Protection Analysis (LOPA) studies. Her previous experience is in optimization and inspection of oil refinery equipment.

Credentials

B.S., Chemical Engineering, The Ohio State University, 2014, *Cum Laude*

Registered Professional Engineer (Chemical Engineering), State of Ohio

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

ISA 84 SIS Fundamentals Specialist (ISA84 SFS)

Key Assignments

Ms. Glick has been involved with 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 target SIL, Conceptual Design Evaluation and 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
- Onshore Gas Plants
- HF Alkylation (Alky)
- Sulfolane
- Cumene
- Catalytic Reforming
- Fluidized Catalytic Cracking (FCC)
- Crude / Crude Vac
- Amine Treating / Sulfur Recovery (SRU)
- Hydrotreating / Hydrocracking
- Liquefied Natural Gas (LNG)
- Utility Boilers
- Nuclear Fuels Production Wash Process
- Nuclear Fuels Production Labs
- UF6 Vaporization
- Toluene Diisocyanate (TDI) Production
- Asphalt Shingles Recycling
- Solvent Recovery in Polymer Production

In a nuclear waste storage facility, performed CFD modeling to determine the extent of toxic gas dispersion and optimal placement of gas detectors. Utilized research papers and site data to estimate release rates and concentrations. Ran over 4,000 CFD models to simulate varying meteorological conditions and waste configurations. Evaluated the effectiveness of stack dispersion of vapors and made recommendations on stack monitoring alarm setpoints.

Created Computation Fluid Dynamics (CFD) models to determine the effectiveness of combustible gas detectors and the extent of the flammable hazard in an off-shore oil platform.

Key Assignments - Continued

Utilized Fault Tree Analysis (FTA) to determine the overfill potential of distillation towers and vessels. Made recommendations on Safety Instrumented System (SIS) equipment based on structural integrity of the vessels.

Performed SIL selection and verification studies on a natural gas processing plant in the Midwest. Utilized LOPA methodology to select SIL targets on over one hundred Safety Instrumented Functions (SIF).

For a frozen dessert manufacturing facility, modeled the release of liquified nitrogen in CFD. Determined the potential for locations of insufficient oxygen and recommended placement of oxygen detectors.

In a unit upgrade project, utilized Effigy Fire and Gas Mapping Software to place combustible gas detector placement.

Performed SIL Verification, FTA, and LOPA analysis on the possibility for oxygen depletion in a particle accelerator research facility.

Performed a QRA of continuous mode SIL 3 functions on High Pressured Flare Lines. Made recommendations for instrumentation to meet frequency requirements.

FGS design and validation for toxic and combustible gas hazards in a Coking Unit in a North American Refinery. This project included hazard identification, design of the gas detection system, and gas detector coverage mapping analysis.

In a QRA of a North American Tank Farm, utilized CFD to evaluate the extent of combustible and toxic gas dispersion. The site layout was created from plot plans and equipment data sheets. Several weather conditions were analyzed.

Utilized PHAST and NIST Thermodynamics modeling software to determine the extent of combustible gas dispersion from overfilling and fire case release scenarios through PSVs.

Created a CFD model of the dispersion of combustible gas in several tank overfill scenarios in a South African Refinery. Utilized the combustible cloud sizes in Effigy to optimize gas detector placement.

Utilized Fault Tree Analysis and Human Reliability data to determine if sufficient risk reduction occurs in a system of several control loops to prevent gas blow by.

Created CFD models to analyze the accumulation of hydrogen in compressor shelters. Utilized models to determine if sufficient ventilation occurred during a compressor failure.

Participated in two Turn-Arounds (TAR) at an oil refinery in the Midwest. Completed HF Alky certification and performed inspections in C and D level personal protective equipment. Has overseen the installation of numerous orifice plates and catalyst loadings. Ms. Glick has inspected distillation towers, heaters, vessels, reactors, heat exchangers, piping plans, and pressure relief valves.

Ms. Glick has utilized HYSYS to optimize distillation towers in a Sulfolane unit. Her work saved over half a million dollars in energy annually and decreased the amount of benzene sent to gasoline blending.

Affiliations

International Society of Automation (ISA)
2014 - Present