Professional Profile

John Applegate
Senior Engineer, Kenexis

Fields of Competence

Safety Instrumented Systems (SIS) Engineering
Fire and Gas System Design
Process Hazard Analysis (PHA)
Hazard and Operability Study (HAZOP)
Layer of Protection Analysis (LOPA)
Safety Integrity Level (SIL) Selection
Safety Integrity Level (SIL) Verification
Safety Requirements Specification (SRS)
SIS Function Testing & PSAT
Facility Siting Analysis (FSA)
Fault Tree Analysis (FTA)
Dispersion Modeling
Fire & Gas Coverage Mapping
Chemical Engineering

Experience Summary

Mr. Applegate is a Senior Engineer at Kenexis with experience in Safety Instrumented Systems (SIS) and Fire and Gas Systems (FGS). He is involved in risk-based studies in upstream oil & gas production, petroleum refining and specialty chemicals. Mr. Applegate is responsible for engineered safeguard design basis development and verification/ validation projects. He is also well versed in performance based FGS design including fire and gas detector mapping techniques. His previous experience is in optimization of well performance and production in secondary oil recovery.

Credentials

B.S., Chemical Engineering
The Ohio State University

Professional Engineer

ISA/IEC 61511 SIS Expert

Qualified on Safety Instrumented System - Front End Engineering Design Parts 1 & 2

Affiliations

International Society of Automation (ISA)
American Institute of Chemical Engineers (AIChE)
Society of Petroleum Engineers (SPE)

Key Assignments

Performed various SIS design basis studies of refineries. Studies have utilized PHA and LOPA methods to assess risk. Project responsibilities included development of Safety Instrumented Function (SIF) list, SIL selection using LOPA methodology for both existing and proposed systems, quantitative reliability analysis to verify achievement of SIL targets through use of fault tree analysis (FTA) and developed the safety requirement specifications (SRS) for the SIS. Systems analyzed include:

- Crude/Vacuum Distillation
- Compressor Systems
- Fired Heaters & Boiler Systems
- Hydrogen Reforming
- Hydrotreating / Hydrocracking
- Coking Units
- Steam and Condensate Systems
- NGL Fractionation
- Sulfur Removal & Recovery
- Alkylation Units
- Flare Systems / Overpressure Protection
- Onshore Oil & Gas Production
- Batch Chemicals
- Storage & Loading
- Wastewater Treatment
- Steam & Power Generation

Performed PHA and LOPA studies for several major NGL fractionation facilities. Projects have included SIL selection, SIL verification calculations, SRS development and development of function testing procedures to meet client objectives.

Created Computational Fluid Dynamics (CFD) models to determine the effectiveness of combustible and toxic gas detectors and the extent of the flammable and toxic hazards for an off-shore oil platform.

Participated in a LOPA study of a gas storage and transport facility. SIS design basis responsibilities included identification and definition of safety instrumented functions, risk analysis to determine safety integrity level (SIL), and SIL verification calculations to quantitatively verify achievement of SIL targets. Responsibilities also included development of the safety requirement specifications (SRS)

Performed several facility siting assessments to determine the impact of hydrocarbon releases at wells and other oil production facilities in West Texas. These analyses included determining the maximum credible event possible via dispersion modeling to ensure

compliance with corporate policies and industry standards.

Executed performance based fire & gas system design for onshore & offshore gas processing facility. The facility included wellhead, gas treatment, separations, and accommodations platforms. The study consisted of selecting performance targets, fire and gas detection mapping, and engineering design to meet selected performance targets.

Performed PHA and LOPA studies for numerous polymer production facilities, ranging from polypropylene to ABS plastics. Projects have included SIL selection, SIL verification calculations and recommendations for design/testing of SIS to meet client objectives.

Participated in studies on hazardous waste and solvent storage at a large research and development facility. Projects used LOPA methodology to analysis the risk associated with the process. Projects also required a probability of ignition study to determine the likelihood a fireball were to occur in the event containment was lost. Studies also consisted of SIL verification calculations and development of the SRS.

Managed and conducted Pre-Startup Acceptance Testing (PSAT) of Critical Devices for multiple major US refineries and an LPG terminal. Responsibilities included development of Function Testing Procedures, inspection of instrument installation and supervision of testing to ensure compliance with corporate and industry standards.

Assisted a Midwestern refinery in the development of their SIS. Responsibilities included SIS conceptual design, facilitation of SIL selection using the LOPA methodology, and developed of the Safety Requirement Specifications (SRS) and Functional Test Plans (FTP).