KENEXIS

Professional Profile

Varun N. Bhuyan
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
Fire & Gas System (FGS) Design Basis / Mapping
Safety Integrity Level (SIL) Verification
Quantitative Risk Assessment (QRA)
Fault Tree Analysis (FTA)
Functional Test Plan (FTP) Development
Safety Requirement Specifications (SRS)
Dispersion Modeling
Control Loop Criticality (CLC) Selection
Reliability Centered Maintenance (RCM)
Computational Fluid Dynamics (CFD) Modeling
Capital Expenditure (CAPEX) Analysis
Human Reliability Analysis (HRA)

Experience Summary
Mr. Bhuyan is a Senior Engineer at Kenexis with experience in risk analysis. Fire and Gas Systems (FGS), Safety Instrumented Systems (SIS) and Computational Fluid Dynamics (CFD). He is involved in risk-based studies in upstream and downstream oil & gas production and specialty chemicals. Mr. Bhuyan is responsible for engineered safeguard design basis development and verification/validation projects. He is also specialized in performance-based FGS design including risk-based techniques for FGS integrity analysis and fire & gas detector mapping techniques. Mr. Bhuyan also has experience in consequence modeling and has utilized Computational Fluid Dynamics (CFD) paired with extensive Chemical Engineering calculations to meet a variety of customer needs. Mr. Bhuyan's career includes several international projects with onsite assignments in the United Arab Emirates, China, Canada, Trinidad and Tobago, and Saudi Arabia.

Credentials
- B.S, Chemical Engineering - The Ohio State University
- Qualified on Safety Instrumented System – Front End Engineering Design)
- Qualified on Fire and Gas System Design – Performance Based Engineering Qualified on Burner Management Systems Qualified on Process Hazards Analysis Leadership (2.8 CEUs)
- Qualified on Layer of Protection Analysis Facilitation
- Certified ISA84 SIS Fundamentals Specialist

Key Assignments
Participated in PHA-LOPA/SIL selection to form basis for subsequent SIS activities. Project responsibilities included development of Safety Instrumented Function list, PHAs, SIL section (via LOPA), SIL Verification calculations, development of plantwide safety requirement specifications, and the development of both functional and pre-startup test plans. Primary project goals include reducing overall costs associated with the SIS lifecycle (both fixed and variable costs) while always ensuring safety criteria is being achieved. Systems analyzed include:
- Fired Heaters
- Coke Drums
- Amine Treating / Sulfur Recovery (SRU)
- Utility Boilers
- Compressor Systems
- Chemical Storage and Injection
- Custody Transfer
- Waste Heat recovery
- Natural Gas Engines
- Mol Sieve Dust Filters
- Hydrogen Reformer
- Naphtha Splitters
- Utilities Systems
- Pipeline Pig Launchers/Receivers
- Flare Systems
- Storage Facilities/Tank Farms
- Polypropylene Silos
- Hydrogenation
- Maleic Anhydride Reactors

Performed focused Quantitative Risk Assessments for a variety of applications via Fault Tree Analysis to model complex functionality and identify gaps in performance. Systems analyzed in this manner include:
- Steam and Condensate Systems
- Flare Loading
- Compressor Systems
- Rail Loading Lines
- Storage Facilities/Tank Farms
- Operator Response and Human Reliability

Performed Fire & Gas System design and validation projects for numerous facilities. These projects included both process and non-process areas, incorporating risk-based design for process areas. Projects include hazard identification, risk-based analysis of existing fire & gas systems, FGS-SIL Assessment, and Fire & gas detector coverage mapping analysis. Systems analyzed include:
- Offshore Platforms
- LNG Facilities
- Wax Refining (Volatile organics)

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Performed Control Loop Criticality Selection and subsequent QRAs with process and RCM/Root Cause analysis. This Analysis served as basis for a variety of recommended action, including additional instrumentation and modified preventative maintenance routines. Systems analyzed include:

- Fractionation
- Refrigeration
- LNG Storage

Performed Computational Fluid Dynamics Modeling for a wide variety of applications. These projects included both indoor and outdoor facilities and process and non-process areas. Results of these analysis were used as basis for recommendations including change in site procedures and process reconfiguration. Systems analyzed include:

- Blanket Gas Leaks (Oxygen Asphyxiation)
- Natural Gas Engines (Loss of Containment and Heat Accumulation, Electrical Area Classification)
- Outdoor Wind Effects on Stack Release Migration
- HVAC Systems (Mitigative Functionality)
- High Pressure Leak Systems (Large Scale Natural Gas Leaks)
- Positive Pressure Effects on Indoor Gas Migration
- Outdoor Heat Exhausts (Variety of Equipment)
- Toxic Gas Releases
- Open Path Detector Effectiveness

Relevant Software Proficiency

- Kenexis Suite: Vertigo, Effigy, Arbor, OpenPHA
- PHA-Pro
- PHA Works
- Fire Dynamics Simulator (FDS) and Smokeview
- Reliability Workbench
- Pyrosim
- Microstation
- Autodesk Inventor

Affiliations

- International Society of Automation (ISA)
  - Local Section Officer (Columbus)
- American Institute of Chemical Engineers (AIChE)