

### **Peter G. Hereña** **Senior Engineer**

#### **Fields of Competence**

Safety Instrumented System Engineering  
Process Hazards Analysis / Hazard Identification  
Quantitative Risk Analysis  
Chemical Engineering  
Process Safety Management  
Control System Design and Commissioning  
PLC Programming

#### **Experience Summary**

**Mr. Hereña** has ten years of experience in the design and installation of control systems and the implementation of safety instrumented systems for the process industries. Mr. Hereña is a Senior Engineer at Kenexis and responsible for facilitating HAZOP and SIL Selection. Additionally, he has extensive experience in engineered safeguard design basis development and verification/validation projects. Mr. Hereña began his career with UOP, a licensor of process units to the petroleum and petrochemical industries, where he performed field verification of control systems at customer sites, and designed and managed development of custom control projects. Mr. Hereña is very involved in the International Society of Automation (ISA) and participates on ISA standards committees, including SP 84 for safety instrumented systems and SP 18 for alarm systems.

#### **Credentials**

B.S., Chemical Engineering, Northwestern University, 1997  
B.S., Environmental Engineering, Northwestern University, 1997

#### **Key Assignments**

Performed and managed safety instrumented system (SIS) design basis development and verification / validation projects at numerous customer sites worldwide on various process units. SIS design basis projects included identification and definition of safety instrumented functions, risk analysis to determine safety integrity level, quantitative reliability analysis to verifying achievement of SIL targets, Safety Requirements Specifications development, and in some cases, functional test plan development and PSAT assistance. Trained and experienced in hazard/risk assessment techniques, including HAZOP, LOPA, Risk Graph, What-If, Fault Tree and Reliability Block Diagrams.

- Hydrocrackers
- Steam Reformers
- Hydrogen Purification Units (Liquid/Liquid, PSA, Membrane)
- Diesel Hydrotreating
- Gasoline Hydrotreating
- Naphtha Reformers
- Cokers
- Fluidized Catalytic Cracking (FCC)
- Onshore/Offshore oil and gas production
- Sulfolane
- Ammonia Synthesis
- Nitric Acid Synthesis
- Urea Ammonium Nitrate (UAN) Production
- Compressor Systems (Centrifugal, Reciprocating and Screw)
- Fired Heaters (Natural, Forced Draft, Induced Draft, Balanced Draft)
- Emergency Isolation Valves

### Key Projects

Participated in performing all aspects of implementing the requirements of the ISA 84.01 specification and IEC 61508/61511 specifications for a major U.S. refiner. The project included HAZOP, SIL selection, SIL verification and Safety Requirements Specification (SRS) tasks for numerous refinery units.

Performed detailed fault tree analyses of process systems for the purpose of determining the overall availability of highly critical systems such as a hydrocracker reactor and recycle hydrogen compressor.

Assisted a major petroleum refiner in establishing design guidelines for emergency isolation valves (EIVs). Project included benchmarking of practices of peer refiners and providing a cold-eye review and recommendations for improvement of the standard, based on industry practices and peer company practices.

Contributed to the SIL validation, verification and SRS generation for several SIS that were installed at offshore platforms in the Gulf of Mexico.

Managed the detailed design, construction, installation, and start-up of several multi-million dollar control system projects. Projects included control system detailed design, control software development, operator interface software development, advanced process control software development, controller assembly and fabrication, packing and shipping, installation and pre-startup checkout. Projects also included Hazard Identification and What-If risk analysis performed on critical projects.

Developed, managed and tested the development of Pressure Swing Adsorption (PSA) logic in four critical software platforms for a petrochemical technology licensor. Also developed custom logic for startup, shutdown sequencing for oil-flooded screw compressors, as well as capacity control and spillback control algorithms. Objective was to reduce development time, cut employee and operator training time.

Directed the UOP worldwide PSA technical support desk, serving as technical support for the base of over 600 PSA units worldwide. Fielded customer questions on all facets of the technology, and provided advanced assistance for UOP Field Service personnel. Managed data gathering and coordinated assistance for troubleshooting commissioning, startup and maintenance problems.

Created custom PSA and compressor simulator to assist with internal and external training. Trained UOP Field Operations and software engineers on control theory and best practices.

### Affiliations

American Institute of Chemical Engineers (AIChE)

International Society of Automation (ISA)  
Committees – SP84 and SP18

National Fire Protection Association (NFPA)

### Articles and Technical Papers

Hereña, Peter, "Shared BPCS in LOPA", ISA Mexico 4<sup>th</sup> Safety Instrumented System Forum - Technical Conference, Mexico City, 2008.