

# Ivan Cheng

## PROFESSIONAL HISTORY:

*Risk Management Professionals, Inc.; Irvine, California; Project Engineer; 2013-2016*

*Risk Management Professionals, Inc.; Irvine, California; Senior Engineer; 2016-Present*

## EDUCATION:

*Chemical Engineering, Bachelor of Science, University of California at Irvine, California*

## CERTIFICATIONS: & PROFESSIONAL AFFILIATIONS

*Engineer In Training – Chemical Engineering – State of California*

*Andeavor LAR HAZOP/LOPA/HCA Facilitator Trained*

*Phillips 66 Layer of Protection Analysis (LOPA) Training Certification*

*American Institute of Chemical Engineers (AIChE)*

Mr. Cheng graduated from the University of California, Irvine with a Bachelor of Science



degree in Chemical Engineering with an emphasis on process safety and reliability. Since joining Risk Management Professionals, Mr. Cheng has conducted activities related to process safety and has facilitated and scribed for various hazard analysis projects, including clients in the oil and gas industries. This involvement has given him additional perspective and experience in safety consulting. Mr. Cheng has been actively involved in the development and implementation of safety programs for a number of different industries. He has provided

support for a wide spectrum of projects including:

- Process Hazard Analysis (PHA), including Hazard & Operability (HAZOP) Studies
- Layer of Protection Analysis (LOPA)
- What-if and Checklist Analysis
- Fire/Explosion Consequence Modeling
- Toxic/Flammable Gas Atmospheric Dispersion Modeling
- Quantitative Risk Analysis (QRA)
- Operating Procedure Development
- California Accidental Release Prevention (CalARP)/Environmental Protection Agency (US EPA) Risk Management Plan (RMP) Programs/Occupational Safety and Health Administration (OSHA) Process Safety Management (PSM) Programs

While Mr. Cheng has experience in diverse product lines, all completed projects have used high-end qualitative and/or quantitative risk analysis techniques for decision-making and are focused within the following disciplines:

- Gas Processing and Transport



- Floating, Production, Storage, and Offloading (FPSO) Facilities
- Petroleum (Refining)
- Anhydrous Ammonia Refrigeration
- Municipal Water Treatment
- Chemical Manufacturing (Blending & Production)
- Sulfur Dioxide Dehydration

## **PROJECT EXPERIENCE**

### **Process Hazard Analysis (PHA)/Layer of Protection Analysis (LOPA)**

Mr. Cheng has facilitated and scribed for PHAs and Hazard Reviews, including Management of Change (MOC) PHAs using combined qualitative and quantitative methodologies, including HAZOP, Layer of Protection Analysis (LOPA), Safety Objective Analysis (SOA), Critical Mitigating Element/Key Mitigating Element (CME/KME), and What-if/Checklist, for upstream oil and gas production facilities, midstream transportation and storage, and downstream refining operations. In addition, Mr. Cheng has provided facilitation and scribing support for refrigeration, water treatment, and manufacturing. These PHAs have been conducted in a range of different project life stages, including conceptual design stages, detailed design stage, and operating facilities. The following list is a representative of projects that Mr. Cheng has provided facilitation/scribe support for:

- *Refinery, Carson, CA* – Facilitated the five-year revalidation PHA/LOPA/HCA for the Waste Water Unit. As part of the PHA, the Team reviewed relevant Management of Change (MOCs), previous incidents, external events, human factors, and facility siting.
- *Refinery, South Gate, CA* – Facilitated the five-year revalidation PHA for the naphtha process over 4 weeks. As part of the PHA, the Team reviewed relevant Management of Change (MOCs), previous incidents, external events, human factors, and facility siting.

This study included:

- The Crude Towers (including Vacuum Towers and Side-draw Diesel Towers)
- Naphtha Storage
- Naphtha Loading Racks
- Vapor Recovery Units, and the associated Incinerators
- High-level overview of all utilities including chemical injection, city gas supply, instrument air, steam supply, and cooling water.
- *Fractionation and Isomerization Facility, Shafter, CA* – Facilitated the 2016 five-year revalidation PHA for the regulated process over the course of 13 weeks. As part of the

PHA, the Team reviewed relevant MOCs, previous incidents, external events, human factors, and facility siting. This study included:

- Sulfatreat Unit
  - Fractionation Columns
  - Isomerization Reactors
  - Storage.
  - Hydrogen Plant
  - Loading Area (includes Rail and Truck)
  - High-level overview of all utilities, including chemical injection, fuel gas supply, cooling water, firewater, instrument air, steam supply, and heating fluid.
- *Fractionation and Isomerization Facility, Shafter, CA* - Facilitated the 2017 five-year 20% PHA for the Hydrogen Plant.
  - *Refinery, Carson, CA* – Provided Scribing and Facilitation Support for the LOPA Revalidation of the LPG Recovery Unit.
  - *Compressor Station, Moreno, CA* – Facilitated the initial design PHA for a Compressor Station Upgrade Project including the utility systems, which included emergency shutdown, cooling systems, lube oil system, nitrogen system, SCR system, and vent system.
  - *Compressor Station, Ventura, CA* - Facilitated the initial design PHA for a Compressor Station Upgrade Project including the utility systems, which included emergency shutdown, cooling systems, lube oil system, instrument air system, and blowdown systems.
  - *Solar Generation Facility, Gila Bend, CA* – Facilitated the Venting system MOC. As part of the PHA, the Team reviewed the introduction of siting, human factors, and external events issues.
  - *Distribution Center, Irvine, CA* - Facilitated the five-year revalidation PHA for the Ammonia Refrigeration system using the HAZOP methodology. As part of the PHA, the Team also reviewed the previous PHA recommendations, relevant MOCs, external events, human factors, and facility siting.
  - *Bottling Facility, Riverside, CA* - Facilitated the five-year revalidation Hazard Review for the CalARP covered Ammonia Refrigeration and water treatment process using the What-if/Checklist methodology. As part of the Hazard Review, the Team also reviewed the previous PHA recommendations, relevant MOCs, previous incidents, external events, human factors, and facility siting.

- *Beef Packing Facility, Selma, CA* - Facilitated the PHA for the Ammonia Refrigeration North System Expansion Project using the HAZOP methodology. As part of the PHA, the Team also reviewed relevant MOCs, previous incidents, external events, human factors, and facility siting.
- *Waste Water Treatment Plant, Fremont, CA* – Facilitated the five-year revalidation Hazard Review for the Waste Water Treatment Plant for three different waste water treatment Plants using the HAZOP Methodology. As part of the Hazard Review, the Team also reviewed relevant MOCs, previous incidents, external events, human factors, and facility siting.
- *Agricultural Production Facility, Madera, CA* – Facilitated the five-year revalidation PHA for the sulfur dioxide dehydration process using the HAZOP Methodology. As part of the PHA, the Team also reviewed relevant MOCs, previous incidents, external events, human factors, and facility siting.
- *Manufacturing Facility, Lathrop, CA* – Facilitated the five-year revalidation PHA for the polyurethane foam generation process using the HAZOP Methodology. As part of the PHA, the Team also reviewed relevant MOCs, previous incidents, external events, human factors, and facility siting.
- *Beef Packing Plant, Pico Rivera, CA* - Facilitated the five-year revalidation Hazard Review for the ammonia refrigeration process using the HAZOP Methodology. As part of the Hazard Review, the Team also reviewed relevant MOCs, previous incidents, external events, human factors, and facility siting.
- *Compressor Station, Moreno, CA* – Facilitated the design stage PHA for the relief valve sizing project using the HAZOP Methodology. This study also included an analysis of the compressors. As part of the PHA, the Team also reviewed relevant MOCs, previous incidents, external events, human factors, and facility siting.
- *Compressor Station, Rainbow, CA* – Facilitated the design stage PHA for the relief valve sizing project using the HAZOP Methodology. This study also included an analysis of the compressors. As part of the PHA, the Team also reviewed relevant MOCs, previous incidents, external events, human factors, and facility siting.
- *Food Manufacturing Facility, Santa Ana, CA* – Facilitated the five-year revalidation Hazard Review for the ammonia refrigeration process using the HAZOP Methodology. As part of the Hazard Review, the Team also reviewed relevant MOCs, previous incidents, external events, human factors, and facility siting.

- *FPSO, Houston, TX* – Provided HAZOP Study Documentation Support for the detailed-design phase of the Firefighting System PHA. This study included the firewater ring mains, foam systems, and associated monitors and equipment.
- *Crude Oil/Gasoline/Ethanol Terminal, Galena Park, TX* – Provided HAZOP Study Documentation Support for the revalidation of the PHA for the Terminal, including receipt, storage, and loading of the various products.
- *Crude Oil/Propane Terminal, Corpus Christi, TX* – Provided HAZOP Study Documentation Support for the detailed review on potential hazards arising from operation of the Terminal
- *Ethanol Terminal, Hatch Point, British Columbia, Canada* - Provided HAZOP Study Documentation Support for the detailed review on potential hazards arising from operation of the Terminal
- *FPSO, Houston, TX* – Provided HAZOP Study Documentation Support for a PHA review on the change in service of an already built FPSO, including the topsides processes and an overview of the various support systems.
- *Gas Plant, Brea, CA* - Provided HAZOP Study Documentation Support for the five year revalidation PHA of the Facility.
- *Gas Plant, McKittrick, CA* - Provided HAZOP Study Documentation Support for the five year revalidation PHA of the entire Facility, including multiple process units and vessels.
- *Gas Plant, McKittrick, CA* - Provided the five-year resubmittal PHA scribe Support, involving a detailed study on potential hazards arising from operation of the Gas Plant.
- *Gas Storage Facility, Aliso Canyon, CA* – Provided HAZOP Study Documentation Support for the DEHY 2 Upgrade Project. The study encompassed multiple units designed for the removal of oil, brine, and sand from the withdrawal gas.
- *Gas Storage Facility, Playa Del Rey, CA* – Provided HAZOP Study Documentation Support for the H<sub>2</sub>S Removal System PHA.
- *Gas Storage Facility, Playa Del Rey, CA* – Provided HAZOP Study Documentation Support for the LTS Replacement PHA.
- *Oil Cleaning Facility, Bakersfield, CA* – Provided PHA/SOA scribe support for the Oil Cleaning Plant, including multiple process vessels on the oil and water processes.
- *Refinery, Martinez, CA* - Provided HAZOP Study Documentation Support for the refinery
- *Vapor Recovery Unit, Huntington Beach, CA* - Provided PHA/SOA scribe support for a vapor recovery unit.

## **CLIENT LIST**

The following is a partial list of clients that Mr. Cheng has managed and/or provided engineering support.

### **Municipalities and Water Treatment**

- Alameda County Water District (ACWD)
- Los Angeles Department of Public Works (LADPW)
- County of San Luis Obispo
- United Water Conservation District (UWCD)

### **Manufacturing/Chemical Processing/Agriculture**

- Carpenter Company
- CRC Industries
- PCC Rollmet
- Sun Maid
- Supreme Plating
- Wilbur-Ellis

### **Ammonia Refrigeration Facilities**

- Albertsons
- Anheuser Busch
- Fresh Grill
- Harris Ranch
- Lineage Logistics
- Manning Beef
- Pepsi Bottling Company
- ReadyPac
- SeaCatch Seafoods
- Steuben Foods
- Sunrise Growers/Froz-Sun
- Systems Services of America

### **Oil and Gas**

- Andeavor
- Berry Petroleum
- BreitBurn Energy Partners L.P.
- Chevron
- GASCO Das Island
- Lunday-Thagard Company
- Linn Energy
- Occidental Petroleum
- Plains LPG Services LP
- San Diego Gas & Electric
- Santos GLNG
- Seneca Resources
- Southern California Gas Company
- Williams Midstream