



MHRD Scheme on Global Initiative on  
Academic Network (GIAN) &  
Commissionerate of Technical Education,  
Gujarat State



By,

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USA

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2018  
To  
19th January  
2018

# GIAN

Government  
Engineering  
College

GANDHINAGAR



## PHA / HAZOP Reviews & SIL Determination (LOPA)

## OVERVIEW

Process Hazard Analysis (PHA) workshops are qualitative risk assessment methods used to identify chemical, physical, or changing conditions which have the potential for causing damage to human life, the environment, or property. They are vital to ensure that all process facilities are operating safely and efficiently.

LOPA (Layer of Protection Analysis) has been described as a semi-quantitative method of risk analysis and is a progressive approach to risk reduction for the process industries. The key elements that differentiate it from qualitative PHA tools are the quantification of initiating causes and utilizing the probability of preventing the event through independent protection layers and/or application of conditional modifiers. Such use of failure rate data gives a better prediction of whether or not the hazards identified in the PHA have been mitigated to a level acceptable as defined by conservative corporate risk targets. Past incidents could have been prevented where common cause failure of multiple safeguards was not captured by qualitative PHA methods.

## OBJECTIVES

Provide background on the Investigation phase of the Safety Lifecycle as applied to functional safety for the process industry

Outline fundamentals of Process Hazard Analysis with specific emphasis on the common "Hazards and Operability" (HAZOP) study format

Build a supporting case for use of Layer of Protection Analysis (LOPA) as a vital quantitative risk tool to complement the PHA/HAZOP

Explain the Safety Requirements Specification (SRS) documentation requirements for a Safety Instrumented Function once a Safety Integrity Level (SIL) has been defined by LOPA

Detail pitfalls in HAZOP, LOPA, and SRS documentation that should be avoided

## TARGET AUDIENCE

Executives, Entrepreneurs, Engineers and researchers from reputed academic institutions and technical institutions for Instrumentation & Control, Chemical & Petrochemical Technology, Oil & Gas Industry.

Students at all levels (BTech / MSc / MTech / PhD) or Faculty from reputed academic institutions and technical institutions.

## Course Details

Day	Lecture (Faculty)/ Tutorial No.	Content
I	L1 (C A Miller), L2 (P N Parikh)	Safety Life cycle (SLC) Safety Instrumented System (SIS) Role in Safety Lifecycle
	T1	<b>Problem solving session with examples</b>
II	L3 (C A Miller), L4 (P N Parikh)	Principles of Risk Management, Process Hazard Analysis
	T2	<b>Problem solving session with examples</b>
III	L5 (C A Miller), L6 (P N Parikh)	Process Hazard Analysis Implementation Issues, Quantitative Risk Analysis (LOPA)
	T3	<b>Problem solving session with examples</b>
IV	L7 (C A Miller), L8 (P N Parikh)	Safety Integrity Level (SIL) Determination, LOPA Case Studies
	T4	<b>Problem solving session with examples</b>
V	L9 (C A Miller), L10 (P N Parikh)	LOPA Advanced Topics, Safety Requirements Specification (SRS)
	T5	<b>Problem solving session with examples</b>



**Mr. Miller** has over 25 years of experience in process and functional SIS safety, instrumentation, control and automation, safety instrumented systems design and project execution. He is a General Manager / Principal Engineer at SILverstone and is responsible for developing SILverstone's capabilities for such applications.

He has solid experience in SIS project implementation for a variety of process plants across multiple industries. He has worked with Siemens and Honeywell in the South Texas & Louisiana Gulf of Mexico.

He has also supported turbo-machinery protective control aftermarket applications through his position as a service engineer & manager at Petrotech Inc.

These projects included a wide range of responsibilities, from application review and specification to complete solution design engineering.



**P N Parikh** is **ISA-84, SFS & SSS (2016-17)** – Certified Specialist for Safety Instrumented System - Process & Power Industry. He is Certified **Energy Auditor**, Bureau of Energy Efficiency-Ministry of Power, Govt. of India.

He is qualified degree holder in **Electrical, Mechanical & Instrumentation** engineering with experience over **44 years** in Process & Power Industry – Chlor-Alkali, Power, Petrochemical, Agro - chemicals, Textiles.

He has Solid experience of over **45 years in Industry / Academics** as Head of Dept.- Engg., Instrumentation, Technical Services, PHA, HAZOP, SIL Selection / Verification / Validation Specialist for **ISA84 / IEC 61511** standards.

## REGISTRATION FEES

For course registration please visit: <http://www.gian.iitkgp.ac.in/GREGN/index>

Participants From	Fee
Abroad	USD 500
Industry/ Research Organizations	Rs. 25000
Academic Institutions (Faculty)	Rs. 5000
Students	Rs. 2000

- The registration fee which is non refundable is inclusive of course material, high tea, working lunch during the course duration. The fees should be paid by DD in favor of “The Principal, Government Engineering College, Gandhinagar” payable at Gandhinagar.
- Principally, no accommodation will be provided to participants. However, institute will help to find the reasonable accommodation on request. Student participants will be provided hostel facilities by paying nominal fee. The communication in advance regarding accommodation is desirable.

### GIAN Coordinator

#### **M B Chaudhari**

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**Co - Course Coordinator : Dr. C B Bhatt, Principal, Govt. MCA College, Ahmedabad**