Shriram Institute for Industrial Research

Delhi Campus: 19, University Road, Delhi -110007; Email: customercare@shriraminstitute.org
Bengaluru Campus: 14-15, Sadarmangla Indl. Area, Whitefield Road, Bengaluru - 560048

SIIR Centre of Excellence on PARA

Process Safety Audit and Risk Assessment (PARA) preventing industrial accidents

What are the objectives of Process Audit and Risk Assessment (PARA)?

The overall aim of PARA is the identification of potential hazards leading to risk and assessment of the impacts of all probable and credible events. This would help in devising a mitigation plan to reduce risk associated with the design, construction and operational stages of industrial and other facilities. The PARA includes identification of hazard scenarios and consequence analysis. Scenario identification describes how an accident occurs, while consequence analysis describes the anticipated damage to environment, life and equipment.

What are the major threats with respect to process safety?

- Toxicity and Poisoning
- Fire
- Explosion
- Harmful impacts to Life and Infrastructure

What are probable causes of industrial accidents?

- Process deviations such as pressure, temperature, flow and other parameters.
- Inherent hazard potential of raw material.
- Runaway reaction, if not controlled and regulated.
- Hardware and equipment failure resulting in large-scale spills of toxic substances.
- Boiling Liquid Expanding Vapour Explosion (BLEVE) of pressurized flammable liquids.
- Electric short-circuit and failure of panels
- Cutting and welding
- Open flame
- Carelessness, Poor housekeeping, Smoking in the work zone etc.
- Sabotage
- Natural disasters

What are the National and International Guidelines, Regulations, Frameworks for control of emergencies and Disaster Risk Reductions?

National Disaster Management Authority (NDMA), is an apex Body of Government of India, with a mandate to lay down policies for disaster management.

NDMA was established through the Disaster Management Act enacted by the Government of India on 23 December 2005. NDMA is responsible for framing

policies, laying down guidelines and best-practices for coordinating with the State Disaster Management Authorities (SDMAs) to ensure a holistic approach to facilitate disaster management

The Oil Industry Safety Directorate (OISD) is a technical advisory body in India. It was established in 1986 by Ministry of Petroleum and Natural Gas. The OISD formulates and implements safety standards for the oil industry.

Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000 regulates the threshold quantity of chemicals to be manufactured, stored and transported.

India is a signatory to the Sendai Framework for Disaster Risk Reduction, which was adopted during the Third UN World Conference on Disaster Risk Reduction in March 2015 to work towards making all stakeholders disaster resilient and significantly reduce the loss of lives and assets. The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) is the first major agreement of the post-2015 development agenda and provides Member States with concrete actions to protect development gains from the risk of disaster

Describe the Type and Levels of Industrial Emergencies

Emergencies can be categorized into three broad levels on the basis of seriousness and response requirements, namely

Level - I

The emergency or an incident which can be effectively and safely managed, and contained within the site, location or installation by the available resources and has no impact outside the site, location or installation.

Level- II

The emergency or an incident which cannot be effectively and safely managed or contained at the location or installation by available resources and additional support is alerted or required. It is having or has the potential to have an effect beyond the site, location or installation and where external support of mutual aid partners may be involved. It may likely pose danger to life, the environment or to industrial assets or reputation.

Level- III

This is an emergency or an incident with off-site impact which could be catastrophic and is likely to affect the population, property and environment inside and outside the

installation, and management and control is done by district administration. Although the Level-III emergency falls under the purview of District Authority but till they step in, it should be the responsibility of the unit to

manage the emergency.

Level-I and Level-II are generally grouped as onsite emergencies and Level-III as off-site emergencies.

What is the Code of Practice for Hazard Identification and Risk Analysis in India?

Indian Standard Specification IS 15656 is the Code of Practice intended for safety professionals and engineers in the areas of chemical plant safety to upgrade safety performance of the plants and covers the methods of identifying, assessing and reducing hazards including evaluation and selection of methods for particular applications. This code describes specific techniques to prevent human and property losses in the operation and management of process plants. The overall methodology allows systematic identification of hazards as well as quantification of the risks associated with the operation of process plants.

What is the objective of Onsite Emergency Plan (OSEP) / Disaster Management Plan (DMP)

The purpose of OSEP/ DMP is to provide various measures to prevent accidents through good design, operation, maintenance and inspection by which it is possible to reduce intolerable risk to tolerable risk or at least "As Low As Reasonably Practicable (ALARP)". OSEP/ DMP provide detailed contingency planning for management of disasters and prevention of accidents.

Why Training and Outreach Process Safety and Disaster Risk Reduction is important?

Emergency occurs very rarely, as such it is neither a day-to-day activity nor a planned activity. The emergency management has to be coordinated and this could be achieved by an organizational approach with effectiveness and efficiently. The organization shall be capable of providing quick response at any time round-the-clock to manage disasters. The emergency response coordination is critical for the protection of lives and infrastructure. Training and outreach of stakeholders on a regular basis will help them to adopt proactive approaches to manage emergencies.

What are the services offered by Shriram Institute for Industrial Research (SIIR) in the areas of PARA and Process Safety Training and Outreach?

The Shriram Institute for Industrial Research has expertise, experience and credentials in :

- Risk Assessment and HAZOP (RAH)
- Process Safety Audits (PSA)
- Development of Emergency Response and Disaster Management Plan (ERDMP)
- Online/ Onsite/ Residential Training and Outreach programmes on process safety (TRNG

The way forward

- For your safety audit needs, feel free to contact 'SIIR-CoE on PARA'..
- Please visit our facilities and witness the infrastructure developed at SIIR to solve this problem.
- SIIR will be happy to have a partnership with affected trade bodies to solve this proble.

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Which Industrial and Service Sectors need the PARA and Process Safety Training?

Sector	PARA Components				Sector	PARA Components			
	RAH	PSA	ERDMP	TRNG		RAH	PSA	ERDMP	TRNG
Agrochemicals	√	√	√	√	Metallurgy	√	√	√	√
Aluminum	√	√	√	√	Mining	√	√	√	√
Automobile	√	√	√	√	MSMEs	√	√	√	√
Bulk Chemicals	√	√	√	√	Petrochemicals	√	√	√	√
Cement	√	√	√	√	Petroleum & Gas	√	√	√	√
Chemical	√	√	√	√	Pharmaceuticals	√	√	√	√
Chlor-alkali	√	√	√	√	Poultry	√	√	√	√
Dairy	√	√	√	√	Pulp and Paper	√	√	√	√
Distillery	√	√	√	√	Real Estate	√	√	√	√
Dyes & Pigments	√	√	√	√	Steel	√	√	√	√
Fertilizer	√	√	√	√	Sugar	√	√	√	√
Food Processing	√	√	√	√	Tannery	√	√	√	√
General Industries	√	√	√	√	Textile	√	√	√	√
General Insurance	√	√	√	√	Thermal	√	√	√	√
Infrastructure	√	√	√	√	Warehouses	√	√	√	√

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