

SERIOUS ACCIDENTS IN MAY-JUNE 2021

Fire at HPCL's Visakh Refinery



A fire broke at Hindustan Petroleum Corporation's Visakh Refinery one of the units near Visakhapatnam on 25th May 2021. No injuries or casualty was reported and the fire was put out within an hour.

18 Dead in Fire At Chemical Firm



At least 18 workers, mostly women, were charred to death in a devastating fire that broke out at a chemical firm in an industrial area in Pune district on 7th June 2021.



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EDITORIAL

Dear Readers,

"Alive & well at the end of the day" is a mantra which can become a motivating factor for all corporations & everyone employed directly or indirectly in industrial establishments. The Centre of Excellence (CoE) in safety is established at SRICT-Ankleshwar, by the congruous collaboration of UPL Ltd. and Gexcon, Norway. This is first of its kind CoE in India with the vision of developing capability in the field of Industrial safety with special emphasis on Process Safety, as process safety for chemical industry is extremely important to prevent catastrophic events.

The CoE is now gearing up to meet its vision of building capability in Industrial safety by providing various knowledge & skill building programmes on process safety, these programmes are being designed to cater to all levels of stakeholders from Chemical process industries and will be announced shortly.

I humbly urge the leaders of chemical industries to nominate their employees to these training programmes for enhancing knowledge & skills on chemical process safety which will pave a path to safer manufacturing operations.

I remember coming across some very important aspects on Safety which were really thought provoking ... it was a paradigm shift from safety to risk based thinking, it also breaks a few myths we all sometimes live with. I would like to invite the attention of leaders to the following:

1. All incidents are preventable, but the risk can never be eliminated completely.
2. Effective risk reduction can correlate to strong safety performance, but strong safety performance does not necessarily mean risks are effectively being managed.

Happy Reading!

Warm Wishes

Mr. Piyush Shah
(Head-Health & Safety, UPL Ltd.)

Tanker Engulfed In Flames After Overnight Crash On I-95



The tank became engulfed in flames on I-95 south after it was hit by another driver. Rhode Island State Police said the accident happened around 1:25 a.m. about 1,000 feet north of Route 195 on 16th May 2021.

Colorado Steel Mill Furnace Explosion Injures 7



A furnace explosion at a steel mill in Colorado has injured seven workers, three of them critically.

Dozens Injured In Russian Gas Station Explosion



A fuel tank explosion at a gas station in Russia's third-largest city Novosibirsk has injured at least 33 people.

CoE ACTIVITIES

ONGOING PROJECTS AT CoE

Projects executed at CoE with the help of FLACS, EFFECTS and RISKCURVE softwares of GEXCON.

3D Modelling
&
Consequence
Analysis of
UPL, Vapi
Plant

Particulate
Matter
(PM10)
Dispersion
Study at
BEIL,
Ankleshwar

3D Modelling
&
Consequence
Analysis of
UPL-5 Plant,
GIDC,
Jaghadia

VIRTUAL REALITY (VR)

3D based VR Safety Training is an advanced technology used by many countries worldwide to experience hazards related to gas dispersion, liquid release (pools), fire and gas explosions in industrial environments. The VR based Safety Training is realistic CFD based dispersion, fire and explosion simulations in a virtual reality environment using head mounted display (HMD). The main application area for a 3D based VR Safety Training is to enhance risk awareness and improve emergency response through education / training in a virtual reality environment as a replacement to traditional book-based education and real practical training. CoE at SRICT has developed such type of advanced training facilities to educate the ground floor working people from different industries.



Large Blaze At Illinois Chemical Plant Prompts Evacuations



Firefighters were sent to the Chemtool Inc. chemical plant near Rockton, IL after a large fire ignited in the facility on 14th June 2021.

Pesticide Plant Explosion Kills 4, Injures 10



4 people were killed, and 10 others were hurt on 13th May 2021, after an explosion at the Crimsun Organics pesticide plant at the SIPCOT industrial estate in Cuddalore, India.

Chemical Plant Explosion Leaves 4 With Injuries



Four people were injured in an explosion on 11th May 2021 at the Sakai Chemical Industry Co. Ltd. chemical plant in Iwaki, Japan.

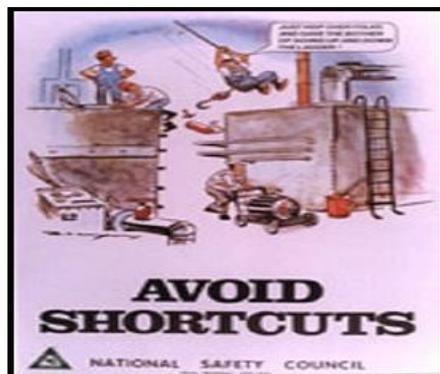
WHEN WE WORK IN INDUSTRY A QUESTION ARISES

WHY INVEST TIME AND RESOURCES FOR SAFETY?

To answer this question, we must discuss the central concepts of safety-performance indicators and values (plant assets, the environment, the public and employees) which are at risk from potential disastrous events. We need to understand what are the best practices for establishing a Process Safety Management (PSM) culture along with designing, implementing and maintaining a proactive PSM system to complement existing functional safety systems.

An assessment can be done at any time which considers the process design, process technology, process changes, operational and maintenance activities and procedures, non-routine activities and procedures, emergency preparedness plans and procedures, training programmes, and other elements that affect the processes at a specific location.

These estimations then lead to a comprehensive PSM programme, which under the US regulation covers 14 elements that work to integrate technologies, procedures, and management practises with the goal of lowering or eliminating the hazards involved, and ensuring that the process is continually upgraded.



Source: National Safety Council

Process Safety Information (PSI) might be considered the starting point of a PSM programme which tells what you are dealing with from both the equipment and the process standpoint. Information on hazardous chemicals as well as the equipment used in each covered process is gathered and put into written form— all employees involved in the process should have access to this information in order to help them identify and understand potential hazards.

The present state-of-the-art safety management includes safety studies (HAZID, HAZOP, risk analysis), safety instrumented systems (SISs) for fire and gas detection, and emergency shutdown, abnormal situation management applications, and operator guidance tools. The first step in implementation of a functional safety system is the upfront analysis and conceptual design. It initiates with a meeting with all stakeholders to determine possible hazards and hazard characteristics, and to establish the basic scope of the project. Work then proceeds to develop the detailed design for the SIS. The next steps involve:

- Executing the process hazard analysis (PHA) and layers of protection analysis (LOPA)
- Specifying the safety instrumented functions (SIFs) and preparing the safety requirements specification (SRS) reports
- Developing the safety integrity level (SIL) verification worksheet and report.

Dr. Shina Gautam
Associate Professor

Dept of Chemical Engineering, SRICT.

Five Women Killed In Blast In Tamil Nadu Fireworks Factory



At least five women were killed in a blast at a private fireworks factory.

Ten Injured In Blast At Steel Factory In Maharashtra's Jalna



At least ten workers were injured on 19th June 2021, in a blast at a steel manufacturing unit in Jalna district of Maharashtra, over 400 km from Mumbai.

Two Contractors Dead Following Explosion At Kerr Dam



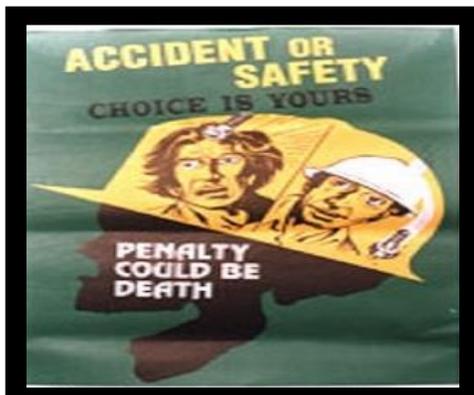
Inspite of an hours-long effort, two men who were trapped following an explosion at Kerr Dam died on 14th May 2021.

ELEMENTS OF PROCESS SAFETY MANAGEMENT

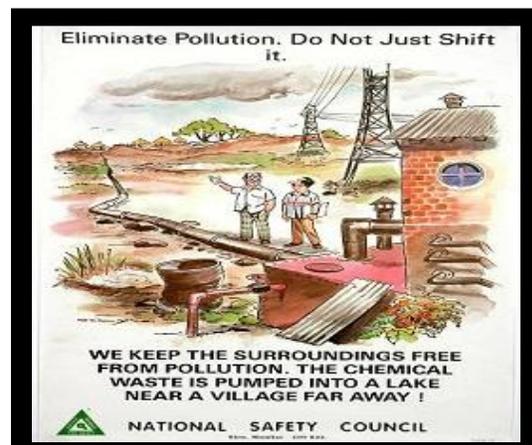
In the 1st Issue of SAFEXCELLENCE, SRICT CoE has selected 17 process safety elements and based on these elements and published literature, an attempt is made to analyze the disasters taken place during the month for the probable cause/s. SAFEXCELLENCE team points out the missing process safety element/s in the events that happened.

MISSING PSM ELEMENTS WHICH CAUSED THE ACCIDENTS May-June 2021

Accidents	Missing PSM elements																
Fire at HPCL's <u>Visakh refinery</u>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fire broke out at SVS Aqua Technologies,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Blast at a steel manufacturing unit in Jana district of Maharashtra,	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Blast at a Private fireworks factory	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
An explosion at the Sakai Chemical Industry Co. Ltd. Iwaki, Japan.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
An explosion at the Crimsun Organics pesticide <u>Cuddalore, India,</u>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Massive fire at <u>Chemtool Inc. Rockton, IL.</u>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
A fuel tank explosion at a gas station in Russia's	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
A furnace explosion at a steel mill in Colorado	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17



Source: National Safety Council



RISK BASED INSPECTION

1. INTRODUCTION

1.1. BACKGROUND

Risk based inspection (RBI) is an asset integrity management methodology used to prioritize assets for inspection based on associated risks. By focusing inspections on priority assets, RBI maximizes resources by concentrating them on equipment with higher risks while avoiding assets with inconsequential risk.

RBI is a prioritization tool examining Health, Safety, and Environment (HSE) risks, as well as operational risks, as a means to rank failure consequence. Used effectively, it assesses items based on the probability of failure (PoF) and the consequence of failure (CoF) and categorizes each item for inspection priority.

1.2. OBJECTIVES

Main objective is to Identification of Critical Element in the system. Results of Risk Based Inspection will be helpful for selection of Inspection method and deciding frequencies of Inspection of Critical/non-Critical Equipment. Risk base Inspection will be useful to reduce the inspection frequencies without compromising the Safety of the Plant/ Facility.

**SEEK SAFETY,
AIM SAFETY,
FOLLOW SAFETY,
ENSURE SAFETY,
TEACH SAFETY,
YIELD SAFETY.**

2. REGULATION AND GUIDELINES

Risk Assessment will be done based on below guidelines:

- Reducing Risks, Protecting People
- Risk Assessment: A Qualitative and Quantitative Approach

Risk Based Inspection and planning will be done based on below Guidelines:

- API Publication 581 – Base Resource Document: Risk Based Inspection
- Health and Safety Executive – Risk Based Inspection (RBI)
- ASME – General Document Volume 1 CRTD-Vol.20-1

3. BENEFITS OF RISK BASED INSPECTION

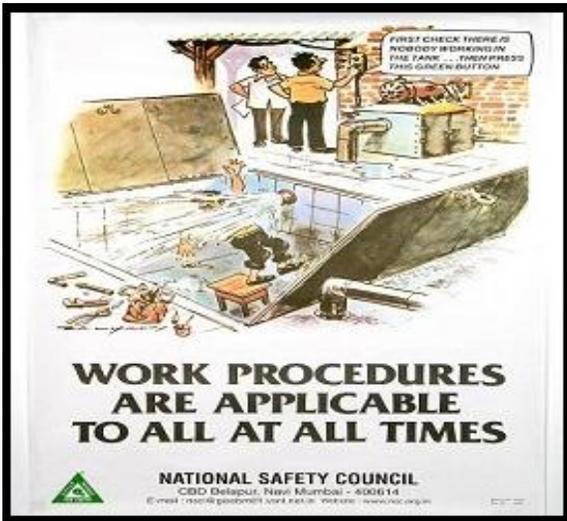
The inspection planning will help in efficient and effective inspection to determine the condition of the plant. This involves balance in the cost of inspection, considering downtime. The inspection planning process comprises of three parts:

- 1] Risk Based Inspection Analysis
- 2] Development of an Inspection Frame Programme
- 3] Detailed Inspection Plan

4. RISK ANALYSIS PROCEDURES

Steps involved in the Risk Analysis are as below:

- Identification of accident scenarios
- Failure Frequency Estimation
- Consequences Analysis
- Determination of the risks (Risk Assessment will be done based on Risk Criteria)



5. DEVELOPMENT OF THE INSPECTION PLAN

Risk based inspection is a process that involves the planning of an inspection based on the information obtained from a risk analysis of the equipment. The Inspection plan for the Equipment which are posing less Risk and the Equipment which are posing high/ Moderate Risk.

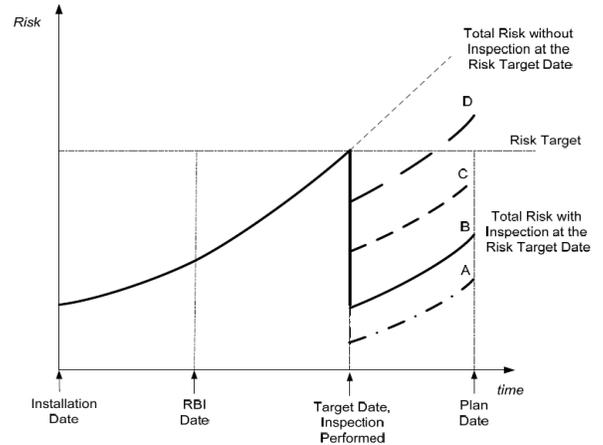


Figure: Inspection Planning When the Risk Target is Exceeded Between the RBI Date and the Plan Date and the Impact of Inspection at Various Levels of Effectiveness (Ref. API-581)

-Amol Lakare

Manager, Process Safety, UPL-5

Qualification for Direct Admission to Diploma Engineering of Fire Technology & Safety course is 10th standard pass. Basically, it is a full-time course of 3 years with a capacity of total 30 seats. The fee for the said course is 19,000/- (Approx.) per semester.

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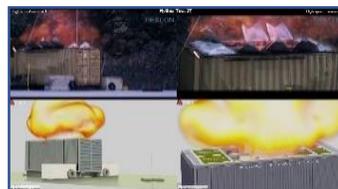
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