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Pictorial HIRAC: A concept of incident prevention in oil and gas process Industry

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Abstract

Oil and gas process industry is the most hazardous industry as it contains flammable, volatile liquids and gases. Accidents are happening worldwide and major cause is the communication gap. Workers face difficulties in reading written documents of risk assessments available at the company. If workers are not given proper training on reading these risk assessment sheets, then it is useless. To avoid such communication gap, I want to introduce a new technique which is called Pictorial HIRAC through this paper. HIRAC is abbreviated as Hazard Identification Risk Assessment and Control is a qualitative risk assessment approach to minimize all possible hazards and their associated risks in the work environment. It is an all new generation idea of converting a normal 'written HIRAC' into the 'Pictorial' form. Hazards Identification is also one of the fourteen pillars of PSM Process Safety Management where it is termed as Process Hazard Analysis. It is well understood that visual is better than written because it leaves 70 percent faster impressions than reading. Illustration by pictures can be easily understood by the workers. Through this paper we want to convey an idea of making Pictorial HIRAC for creating more awareness about the workplace safety.

Keywords: Qualitative risk assessment (QRA), Hazard identification (HAZID), Process safety management (PSM)

Introduction

There isa chance of mass casualty in oil and gas upstream industry if the standard operating procedures are not followed correctly. There are fair chances that a worker may forget a key step of operating procedure, so it is better to avoid written communication at workplace and instead pictorial communication shall be followed. It is well understood that the pictorial communication is better than written because it's a quick medium of communicating information and easy to understand. Also, it requires less number of word (s). It communicates message to the wider audience. But at the same point of time there is a limitation that it can't be understood by everyone it they are not aware of them. The challenge behind converting a traditional HIRAC into pictorial form is that, to get real time pictures which exactly deliver the message to users of what is being done. So as to avoid any communication gap.

Objective

• Study of work place to identify all possible hazards and controls
• Prompt alternative design solutions to mitigate or control the risks to an acceptable level
• Defines criteria for decision making

Materials and method

Pictorial HIRAC is the pictorial representation of the conventional risk assessment sheets that portraying:

- Activities
- Hazards
- Risk ranking
- Control measures

In general a traditional HIRAC contains the following elements namely Activities, Sub activities, Hazards, Severity, Probability, Risk Level and Control Measures.

Table 1.1 gives an idea of a general conventional HIRAC table. (Figures are taken for example) In the first column activities X, Y and Z are shown. In second, the sub activities of these are shown i.e. X-1,2,3, Y-1,2,3, and Z-1,2,3 respectively. In the sixth column risk level is shown w.r.t. to hazards associated with the activities and sub activities. Our main idea is to convert this conventional table into

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new generation 'Pictorial' form so that it will be easy for workers to see and understand what to do and what not to do.This is capable of conveying message in an effective manner. A fully developed pictorial HIRAC can be pasted over all relevant work areas of the company premises. It is an idea for inserting the relevant photographs or graphics which exactly relates the real time activity, sub activity, hazards and their control measures.Prepared total 23 Pictorial HIRAC for an oil and gas service provider company covering whole Mumbai base All Drilling & Measurements and TS activities, Welding, Wash bay and Pressure Test bay, Grinding, buffing, HAZMAT handling, Forklift, Hydra and Mobile Crane, Carpentry, Painting, Electrical and Cleaning & Housekeeping.

Table 1 General Body of Pictorial HIRAC

Activities	Sub activities	Hazards	Severity	Probability	Risk level	Control measures
X	X-1,2,3				4	
Y	Y-1,2,3				1	
Z	Z-1,2,3				3	

Results and discussion

Presented through live pictures which were taken while employees & contractors were working in base in Mumbai. Greater level of acceptance and Involvement of contractors more lively.

1. Studied various segments Base with respect to the activities taking place and hazards associated with it.
2. Prepare a HIRAC in which PPE is assessed.
3. Prepare another HIRAC in which all the contractor activities are assessed.
4. Considering those HIRACs and assessing the real-time activities, prepare a Pictorial HIRAC.
5. Display those Pictorial HIRACs in the work premises.

Reliable way of communicating control measures. Even minute hazards present could be identified. Control measures in pictures make employees and contractors feel it's doable. Posted 43 Pictorial HIRAC in bigger size across whole Base Two projects HIRAC Record form and Pictorial HIRAC were implemented in the base after getting approval from HSE Manager and Facility Manager. Collected data for Resource Management Plan and made a draft RMP for the Mumbai base.

Fig. 1 A typical Pictorial HIRAC for Overhead Crane Operation in Mumbai Base

Conclusion

There are many advantages if we implement Pictorial HIRAC in any Base or work premises. Easy mode of communication through pictures. Greater acceptability and Involvement of contractors more lively. Reliable way of communicating control measures. Even minute hazards present could be identified. Control measures in pictures make workers feel doable. In the organization, the effect of performance is driven by three things: human, money and law. So safety is not only protecting the persons physically but its benefits are also for the companies, as they need not to spend extra money to recover the unwelcome accidents happen. Hence, it can be concluded that organization should be committed to safe practices in all of its operation & maintenance activities .The Health & Safety measures are implemented in order to prevent the risk of work-related incidents and to facilitate the intervention of those concerned during working on job site. Health & Safety law requires employers to look after the health, safety and welfare of their employees. HSE affects work, and persons related to that work for example clients, contractors and visitors to their premises. Employers also have a duty to identify, assess and control safety risks.

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