SCIC
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PreDigest

Safety Critical Task Analysis (SCTA)

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Human activities are involved in different aspect of operation of a chemical facility. Starting from design, construction, commissioning, operation, maintenance till decommissioning, human is involved. For safe and reliable operation, high human reliability is required in all phases of lifecycle of the facility. However human errors have contributed to many major industrial accidents in Chemical facilities in the past. Few examples are listed below:

Feyzin (France) 1966, 18 killed, two valves in drain of LPG sphere liquid outlet line were opened to drain water. Drain valves could not be closed leading to uncontrolled release of LPG to atmosphere which exploded

Piper Alpha (UK) 1988, 167 killed, Standby Condensate Pump under maintenance was started to sustain offshore platform operation. Flammable condensate leaked from improperly tightened flange.

Pasadena (USA) 1989, 23 killed, valve in drain leg for operating reactor loop was opened leading to loss of reactor contents at high temperature, pressure to atmosphere which exploded

Formosa Plastic Corp (USA) 2004, 5 killed, drain valve in reactor in operation phase of batch operation was opened leading to loss of reactor contents at high temperature, pressure which exploded

Above and many more accidents could have been prevented and multiple lives saved if potential of human to make error was considered. Learning from these and many other accidents where human error was the main cause of the accident, chemical industry can take steps to understand and eliminate human errors which can cause catastrophic accidents often leading to fatalities, environmental consequence and significant loss to business.

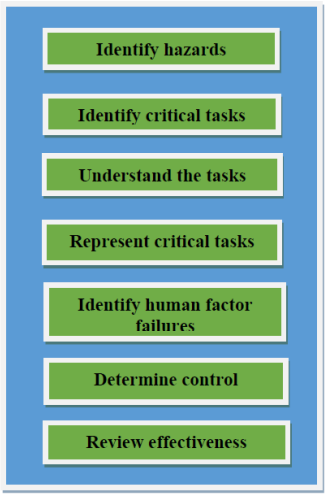
Safety Critical Task Analysis (SCTA) is one such tool to analyse safety critical task to identify potential of human errors and putting adequate safeguards in place to prevent/ mitigate human errors. Safety Critical task are identified as task which if not done properly can lead to catastrophic accidents. Safety Critical Task are human dependent activities and do not have other instrumented or other safeguards in place to prevent catastrophic accident. Detailed analysis of the tasks can contribute to, clear and accurate procedures, improved competency of personnel carrying out the tasks and possibly better design of the equipment and task

Some of the examples of Safety Critical Task are as following:

- Lighting up of burners in furnace
- Connection of transfer hoses to tanks/ equipment
- Assembly of mechanical seals
- Clearing blocked drains, vents and instrumentation
- Drawing samples from live equipment
- Preparing equipment for maintenance

The process of SCTA, as shown on the chart, involves:

- Identifying safety critical task based on the hazards and activities in the facility
- understanding the task and identifying human errors (action or inaction) might make an accident more likely,
- Identify existing prevention and mitigation safeguards in place and determine their adequacy,
- Identify additional safeguards reduce the likelihood or consequences of human errors and reduce the risk to ALARP.



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Process Safety is Everybody's Responsibility!

An initiative of the Process & Engineering Committee

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