



BOILER EXPLOSION DURING COMMISSIONING PHASE

Date Of Incident: DEC-2000

Location : WSHAC

Synopsis:

Boiler was on LPG firing.
Night order was given to light up diesel burner in boiler.
Personal attempted to light up the diesel burner at about 12:30 am. They made several attempts but were unsuccessful. Suddenly boiler exploded with loud noise.

Casualty:

Two deaths and one person was injured.

Root Cause Analysis:

Evaluation of loss: Death and bodily injury. Type of contact: contact with hot steam.

Immediate cause: Use of unauthorized bypass method.

Basic cause: Failure to observe safe work procedure. Inadequate supervision.

Failure of sms: Failure to observe permit to work. Failure in communication. Inadequate safety training.

Corrective measures:

Ensure strict compliance to safe work procedures. Strict enforce permit to work system.

Conduct competency training for all personnel. Review and improve OSH management system.

Observations and Findings;

Failure to observe safe work procedure:

The boilers were in the commissioning stage at the time of the accident. This method was only to be used by the start up team and no process technicians were instructed to use it. This method had been used on several occasions by most of the process technicians.

Failure of OSH management system:

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There was no management of change approval put for management approval to use the temporary bypass method. The bypass method required the opening of 2 bypass valves. There was no control of defeat procedures put up to the management for approval to remove the sealed wire on these valves. Pre-startup safety Review (PSSR) WAS claimed to be carried out on the boiler. But the PSSR document was not available for our review during the Investigation. It was found that the bypass valves did not have any sealed wire when the startup team first implemented the bypass method.

Site findings after the accident:

Site investigations after the accident confirmed that the 2 bypass valves were 50% open. This confirmed that the bypass method was utilized to restart the boiler. Data records confirmed that the LPG control valve was about 66% open just before the explosion. The block valves before and after the control valve were fully open. A direct path was therefore established to allow LPG to enter the firebox, resulting in the explosion of the boiler.

Photograph:



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