Pesticide waste tank explosion at bayer cropscience report examples

Business, Company

Summary

Bayer CropScience is a pesticide producing company in West Virginia. It is independently operated company within Bayer Group, which is its pharmaceutical parent company with its headquarters in Leverkusen, Germany. The company operates in three markets, Bayer CropScience, Bayer HealthCare and Bayer Material Science. Bayer CropScience is a global provider of crop protection agents such as herbicides, insecticides and fungicides for both commercial and private use (Monheim, 12).

On 28th august 2008, two workers were fatally injured when a waste tank having the pesticide methomyl aggressively blasted, destroying the Bayer CropScience chemical plant processing unit in West Virginia. The accident happened shortly after the re-start of the methomyl unit activities. A complex activity was using a brand new control system. Though the operators had some experience on larvin, this was a different process unit with new parameters and adjustment and therefore, their first time of using the control system.

The new process meant to meet their international demands. Methomyl production commenced on 27th august and they had spent a week preparing the equipment. The operators and personnel were familiarizing themselves with the control unit and focusing on the upstream equipment. The control unit personnel were therefore troubleshooting throughout the week before the incident and during the incident (Monheim, 18). This is because the new system called for adjustments, things to check, clarifies and the complexity of the system caused a challenge.

On the day of the incident at 5. 00 AM, the residue treater status was 0% full

and 1040 F; the temperature and flow control devices were in a bypass mode, which means they were ineffective. The flasher bottom feed valves were manually opened as the computer did not make that control. Thirteen and a half hours later, the liquid level was 49% and temperatures of 1450F, which was above its operating temperature. The temperature rise is because of the pre-heated feed and not cold due to decompositions from the methomyl.

The control board operator saw the increased rise in temperature and asked the outside to check the Residue Treater Vent System. The operator went to check the system and called the outside operator for assistance. The emergency valves opened and then followed by a violent rapture where approximately 2500 gallons of methomyl solvent was released to the road. The solvent, which is highly flammable, was blown to the unit. The two people who died were the control operator and the outside operator.

The US Chemical Safety Board team of investigation determined that the runaway chemical reaction and loss of containment of the flammable and toxic chemicals resulted from deviation start-up procedure. This included bypassing critical safety devices intended to prevent such a condition. Other factors that are considered as causative factors include an inadequate pre-startup safety review, inadequate operator training on the newly installed control system, unevaluated temporary changes, missing and/ or malfunctioned machines, misaligned valves among others (Monheim, 24).

The investigation:

The US chemical safety and hazard investigation board conducted the investigation of the explosion. The investigation team included John Vorderbrueggen, Francisco Altamirano, Johnnie Banks, Catherine Carless and Lucy Sciallo. The team presented its finding on 20 January 2011 at a public meeting in institute West Virginia. Its presentation included; the facility and unit overview, incident summary, facility and offsite damage, properties of chemical involved, preliminary findings and the recommendations.

The investigation was conducted by collecting data method from interviewing eye witnesses. The interview proceeded even to the management staffs and some of the community. The committee also interviewed emergency responders and part of the Metro 911 Call Centre. There are various photographs of the incident scene. The committee preserved evidence that is essential to the investigation. The incident description aided the investigation to be reliable. The incident was described in chronological order. This began with pre-startup activities that contributed to the condition leading up to the explosion.

The subsystems in the methomyl unit required a solvent flush in addition nitrogen gas purge that clean and dry the system before startup. However, the staff did not perform the residue treatment solvent run which was contrary to the SOP. This was essential for safe as well as to control methomyl decomposition. There were problems in Unit Restart, although the operations staff acknowledged that management failed in prescription of specific deadline for resuming methomyl production (Monheim, 27).

Accident Report

Incidence analysis, according to CSB they concluded that the process of modification of Residue Treater did not contributed to the incident cause neither its consequences. PHA duration and staffing deficiencies causes complexity in operation hours and therefore become insufficient to address all the critical process safety information. The PHA extends it failure even to assumptions deficiencies for instance, in spite of knowing that interlock settings could be accessed and changed by the operating staff without proper safety reviews as required by the management of change program. The PHA team did not make any recommendations to improve computer access control (Monheim, 34). PHA also did not adequately incorporate the process safety information which was used as basis for the assumptions and conclusions in the investigation.

The key findings, were as follows; process hazard analysis this include

- Inadequate Residue Treater layers for protection of runway reaction.
- The methomyl unit SOP was overly complex therefore; methomyl unit startup was not approved and reviewed.
- The PHA team failed in validating the assumptions this includes SOP, control of process safeguards and conformance to the SOP.

The other key finding is pre-startup safety review.

- The PSSR did not practice formal process involving multiple disciplines.
- There was no verification of complication of modification in PSSR field.

The Last finding was incident causes

- The Bayer failed to apply PSSR standards it restarted the unit before the equipment was appropriately calibrated and tested.

- The operations staffs were inadequately trained for the operations of methomyl unit.

Sketch of Scene

Figure 1 Overhead view of the Methomyl-Larvin production unit

In this unit, Methomyl-Larvin, located in the West Carbamoylation Complex is the unit where methomyl was produced, packaged and later stored for future manufacture of Larvin. The control room was used to control both the units that are methomyl and Larvin units by the outside operators who were trained (Monheim, 39).

Works Cited

Bayer Cropscience Journal. Monheim am Rhein (Alfred Nobel Str. 50: Bayer CropScience AG, 2008). Print.