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U.S. CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD

Urgent Recommendation

Whereas:

1. On March 23, 2005, the BP Texas City refinery experienced a severe chemical accident involving a raffinate splitter tower and associated blowdown system that resulted in 15 deaths, about 170 injuries, and significant economic losses, and was one of the most serious U.S. workplace disasters of the past two decades;

2. Key alarms and a level transmitter failed to operate properly and to warn operators of unsafe and abnormal conditions within the tower and the blowdown drum;

3. The startup of the raffinate splitter was authorized on March 23 despite known problems with the tower level transmitter and the high-level alarms on both the tower and the blowdown drum; for example, a work order dated March 10 and signed by management officials, acknowledged that the level transmitter needed repairs but indicated that these repairs would be deferred until after startup;

4. The majority of 17 startups of the raffinate splitter tower from April 2000 to March 2005 exhibited abnormally high internal pressures and liquid levels – including several occasions where pressure-relief valves likely opened – but the abnormal startups were not investigated as near-misses and the adequacy of the tower's design, instrumentation, and process controls were not re-evaluated;

5. Written startup procedures for the raffinate splitter were incomplete and directed operators to use the so-called "3-lb." vent system to control tower pressure, even though the pressure-control valve did not function in pre-startup equipment checks and also failed to operate effectively during post-accident testing;

6. The Texas City refinery missed opportunities before and after its acquisition by BP North America to connect the tower pressure-relief valves to a safety flare system, as noted in BP's own May 2005 interim investigation report;[1]

7. Most of the fatalities and many of the serious injuries occurred in or around trailers that were susceptible to blast damage and were located within 150 feet of the blowdown drum and vent stack;

[1] The BP interim report states: "Blowdown stacks have been recognized as potentially hazardous for this type of service, and the industry has moved more towards closed relief systems to flare …. Opportunities to tie the Splitter relief lines into a flare system were not taken when it could have been efficiently done in 1995 or 2002 …."

8. The Texas City refinery had a facility siting policy and performed a management-of-change analysis prior to positioning the trailers, but trailers were nonetheless placed in close proximity to the isomerization unit, which had experienced various hydrocarbon releases, fires, and other process safety incidents over the previous two decades;

9. The Texas City refinery experienced two fatal safety incidents in 2004 as well as a serious furnace fire that resulted in a community order to shelter;

10. Subsequent to the March 23 incident, the Texas City refinery experienced a major process-related hydrogen fire on July 28, 2005, that had the potential to cause additional deaths and injuries and resulted in a Level 3 community alert;[2]

11. On August 10, 2005, the Texas City refinery experienced another Level 3 incident involving the Gas Oil Hydrotreater that resulted in a community order to shelter;

12. All three incidents in 2005 raise the issue of the adequacy of mechanical integrity programs at the Texas City refinery;

13. In April 2005 the U.S. Occupational Safety and Health Administration listed the BP Texas City refinery as a subject facility under its Enhanced Enforcement Program for Employers Who Are Indifferent to Their Obligations Under the OSH Act;

14. The U.K. Health and Safety Executive (HSE) investigated and reported on three incidents at the BP Grangemouth refinery in Scotland in 2000, concluding that "BP Group Policies set high expectations but these were not consistently achieved because of organisational and cultural reasons; BP Group and Complex Management did not detect and intervene early enough on deteriorating performance …."

15. The Board believes that the foregoing circumstances and preliminary findings raise serious concerns about (a) the effectiveness of the safety management system at the BP Texas City refinery; (b) the effectiveness of BP North America's corporate safety oversight of its refining facilities; (c) a corporate safety culture that may have tolerated serious and longstanding deviations from good safety practice;

16. The Board believes that corporations using large quantities of highly hazardous substances must exercise rigorous process safety management and oversight and should instill and maintain a safety culture that prevents catastrophic accidents;

17. Under 42 U.S.C. §7412(r)(6)(C)(ii), the Board is charged with "recommending measures to reduce the likelihood or the consequences of accidental releases and

[2] Level 3 is the second highest emergency classification under Texas City procedures. It applies when "an incident has occurred, the situation is not under control, and protective action may be necessary for the surrounding or offsite area."

proposing corrective steps to make chemical production, processing, handling and storage as safe and free from risk of injury as is possible …."

18. Board procedures authorize the development and issuance of an urgent safety recommendation before a final investigation report is completed if an issue is considered to be an imminent hazard and has the potential to cause serious harm unless it is rectified in a short timeframe.

Accordingly:

Pursuant to its authority under 42 U.S.C. § 7412(r)(6)(C)(i) and (ii), and in the interest of preventing the serious harm that could result if the imminent hazards underlying the series of incidents at BP facilities are not promptly rectified, the Board makes the following urgent safety recommendation to the BP Global Executive Board of Directors:

1. Commission an independent panel to assess and report on the effectiveness of BP North America's corporate oversight of safety management systems at its refineries and its corporate safety culture.[3] Provide the panel with necessary funding, resources, and authority – including full access to relevant data, corporate records, and employee interviews – in order to conduct a thorough, independent, and credible inquiry.

2. Ensure that, at a minimum, the panel report examines and recommends any needed improvements to:

    - Corporate safety oversight, including the safe management of refineries obtained through mergers and acquisitions;

    - Corporate safety culture, including the degree to which:

        - Corporate officials exercise appropriate leadership to promote adherence to safety management systems;

        - Process safety is effectively incorporated into management decision-making at all levels;

        - Employees at all levels are empowered to promote improved process safety;

        - Process safety programs receive adequate resources and are appropriately positioned within organizational structures;

    - Corporate and site safety management systems, specifically:

[3] Appropriate reference materials for the design of the assessment may include the Final Report of the Columbia Accident Investigation Board (2003), the Conference Board research report *"Driving Toward '0': Best Practices in Corporate Safety and Health*, the ANSI/AIHA Z10-2005 standard *Occupational Health and Safety Management Systems*, the International Labor Organization (ILO) code of practice *Prevention of Major Industrial Accidents* (1991), and the ILO *Guidelines on Occupational Safety and Health Management Systems* (2001).

- Near-miss reporting and investigation programs;
- Mechanical integrity programs;
- Hazard analysis programs, management-of-change programs, and up-to-date operating procedures for processes with catastrophic potential;
- Siting policies for occupied structures near hazardous operating units.

3. Ensure that the panel has a diverse makeup, including an external chairperson; employee representatives; and outside safety experts, such as experts in process safety; experts in corporate culture, organizational behavior, and human factors; and experts from other high-risk sectors such as aviation, space exploration, nuclear energy, and the undersea navy.

4. Ensure that the report and recommendations of the independent panel, which should be completed within 12 months, are made available to the BP workforce and to the public.