Destructive Deeds from Water and Steam

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ABSTRACT

This paper will review a few basics on the hazards of water and steam within the chemical and petroleum refinery industries. To the youthful, this paper can be instructive with eye-opening reality of fundamentals. To more seasoned individuals these case histories can serve as a reminder of the potential hazards of water and steam using vivid examples which were costly in disappointments, dollars, professional reputation and injuries.

The fundamentals of the sometimes devious, destructive nature of water and steam within a chemical plant or petroleum refinery will be discussed and illustrated via case histories. Seven sketches of incidents will be reviewed. An improperly conducted hydrotest creates $35,000 more unanticipated repairs. An 82-foot (25 m) tall distillation column is accidentally filled with water and while the column is quickly drained, it suddenly collapses and topples. A 73 % caustic soda tank is partially filled with water to clean it and a steam/caustic mix erupts from the vessel. Steam is improperly applied to a chlorine cylinder and an ammonia cylinder in separate incidents. A brand new refinery coker is being steamed out in a pre-start up activity and as the steam condenses, the vessel catastrophically collapses. A tragic explosion and fire occurred in a fluid catalytic cracking unit during a startup after a turnaround when superheated oil is allowed into a vessel which had accidentally accumulated water.

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