Understanding Process Safety Challenges Associated with Heater Operations in the Process Industry

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The Abnormal Situation Management® Consortium (ASMC)\textsuperscript{1} funded a study to investigate challenges associated with heater operations. At the 2009 symposium, an ASMC sponsored paper reported on an investigation on common failure modes and root causes associated with operations practices (Bullemer and Laberge, 2010). At the 2010 symposium, a follow-on ASMC paper was presented on the failure modes associated with procedure execution failures during abnormal situations (Bullemer, Kiff, and Tharanathan, 2011). This presentation provides an update to the previous findings with the additional analysis of incident reports specific to heater operations. The additional analysis emphasizes the specific challenges identified with the operator human-machine interface (HMI) and the use of Safety Instrumented System (SIS) platforms with an emphasis on the process safety management practice. The study team analyzed 16 incident reports using the TapRoot® methodology to identify root causes associated with heater operations failures. The main finding was the failure mode profile for heater operations was different from the profile found in the larger pool of 48 process industry incidents that did not specifically involve heater operations. Specifically, the investigation found a higher prevalence of operations failures due to: (1) Inadequate HMI to support situation awareness, (2) Inadequate operator training for abnormal situation management and team collaboration skills, (3) failure to insure automation applications are fit for purpose before commissioning, and (4) failure to establish maintenance program to ensure automation applications are performing as intended. This paper discusses the implications of these findings for a company’s process safety management practice requirements such as HMI design for SIS platforms, operator abnormal situation management training, and automation deployment and maintenance.