

The Possibility of Fire from Auto Ignition in the Oil Pit: Review of Fuel Sources - A Case Study

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ABSTRACT

Although the oil pit at onshore receiving facility placed in the open air and has good natural ventilation as the pit is atmospheric, it also has a possibility for fire, while in many chemical processes combustible gases and vapors at high pressures and high temperatures are present. The liquid material at the pit not only content heavy hydrocarbon but also condensate that received as the rejection material from upstream gas separation. The study is conducted to identify the possibility of spontaneous ignition based on the liquid material as the fuel sources. Ignition is the result of self reaction from any initial condition (P,V,T) at which the rate of heat gain exceeds the rate of heat loss from the system. In order to evaluate the auto-ignition hazard involved and to ensure the safe and optimal operation of these processes, it is important to define the lowest possible temperature at which spontaneous ignition of the mixtures may take place. The values of the auto ignition temperature (AIT) found in literature are usually determined according to standard test methods in small vessels and at atmospheric pressure (e.g. DIN 51795, ASTM-E 659-75, or BS 4056). However, since the AIT is not constant but decreases with increasing pressures and increasing volumes, these AIT values are often not applicable to industrial environments. The Lab experiment and analysis is created to identify the content of liquid at oil pit, the methane and other vapors -that come from offshore wells- that can produce an auto ignition; arise when the temperature at pit increase. The DSC Thermal Reactivity test is used to determine the exotherms and endotherms of an explosive, because we would like to identify the critical temperatures where a phase change or run-away reaction may occur. The laboratory result show that the content of pit mainly heavy hydrocarbon and water but methane reached 85% and no auto ignition in ambient temperature. And by the analyses of IR Scan; the auto ignition material was less and not enough energy to cause the ignition. The review of material sources also made to identify the inlet of oil pit. Resume that the possibility is low, meanwhile to mitigate the risk fire, the study recommended to install the cover on the top of oil pit and grounded to prevent an electrical static.

Keywords: *oil pit, auto ignition, fire.*