Arroon Ketsakorn 2009: Quantitative Risk Assessment to Set Up Measures for Proactive Prevention of Accident in Varnish Liquid Production Process. Master of Engineering (Safety Engineering), Major Field: Safety Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Thumrongrut Mungcharoen, Ph.D. 177 pages.

This research is to quantitative assess the risk in order to set up measures for proactive prevention of accident in varnish liquid production process. "Check list and Hazard Operability Study (HAZOP)" techniques were used together with the calculation of static electricity occurred during the pumping of chemicals to storage tank in order to assess the risk of possible fire and explosion. The result revealed that there were seventeen cases in the varnish production process with unacceptable risk or high risk to life, health, community and public. For Methyl Alcohol pump, the static electricity in the capacitor formed between the flanges at the nozzle was 0.968 mJ. Comparing with the accepted values of 0.1 mJ, it has high risk for fire and explosion at the capacitor formed between the flanges at the nozzle. For Triethyl Amine pump, the static electricity in the capacitor formed between the flanges at the nozzle was 1.59×10^{-11} mJ. So, there is no risk for fire and explosion at the capacitor formed between the flanges at the nozzle. As a result of this quantitative risk assessment, the safety proactive prevention plan for varnish production process are 1) Install flame arrester at the Methyl Alcohol tank and safety check this flame arrester 2) Install limit switch at the roll of grounding and set up a physical grounding and bonding check list 3) Maintenance the level transmitter at the storage tank 4) Set up a physical storage tank check list 5) Install signal alarm in case of chemical spill at the storage tank 6) Install safety instrument system 7) Set up a safety warning sign "Open valve before Triethyl Amine pumping into the tank 8) Inspect bursting disc and control valve 9) Install strainer and daily check in order to prevent the plug of cooling coils 10) Install two cooling pumps and daily check 11) Inspect air pressure before the start of production process 12) Install check valve in order to prevent the cooling water backflow.

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