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Abstract: In-house Control Integrated System for Accidental H₂S Leak in Oil Refineries

This study is about the hydrogen sulfide generated by the oil refining process and natural gas purification. Should an accident occur in an oil refinery that results in a leak of H₂S, the consequences may be drastic, endangering human life, jeopardizing assets and threatening the environment. Thus, preventive actions must be established for dealing with this type of accident, as well as control activities should an incident occur. The application of this study is the maintenance of the safety, regarding the accidental hydrogen sulfide leak to the atmosphere, emphasizing the activities of emergency control, limited to the inner areas of the oil refineries. The study has shown that the most efficient emergency response for accidental leaks of H₂S is the composition of the two protection actions: evacuation and sheltering. The principal strategy is related to the local sheltering. The results have been obtained through the simulation of scenarios of accidental releases of H₂S to the atmosphere, and by the observation of the behavior of the plume generated. The plume reaches high concentrations in few seconds in the neighboring of the source of the leak, leaving the workmen at this area without enough time to evacuate. The results will be shown in a matrix. The significance of this subject is to corroborate that the in-house control systems of oil refineries for accidental hydrogen sulfide leak show a huge limitation, considering the evacuation, the major, and most of the time, the unique emergency response action.