Kajian ketersediaan dan kesiapan safety barrier pada gas plant PT. XYZ = Availability and readiness assessment of safety barrier at PT. XYZ gas plant

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Abstrak

PT. XYZ tengah membangun gas plant dan ditargetkan on stream pada pertengahan tahun 2017. Saat detail engineering, studi - studi seperti HAZOP, HAZID, SIL telah menetapkan technical barrier namun tidak menetapkan organizational barrier, baik itu procedural maupun human yang turut menunjang keselamatan pelaksanaan startup dan commissioning gas plant. Sebelum dilakukan startup, setiap unit dalam gas plant seharusnya diperiksa dan dievaluasi secara menyeluruh untuk memastikan bahwa unit telah siap beroperasi dan terhindar dari potensi kecelakaan, khususnya ledakan dan kebakaran.
Tujuan dari studi ini menganalisis ketersediaan dan kesiapan safety barrier dalam mencegah dan memitigasi konsekuensi dari hazardous event, yaitu kejadian flammable gas / liquid release. Studi ini meliputi identifikasi skenario initiating event atau threats yang dapat menyebabkan flammable gas / liquid release, mengevaluasi konsekuensi dan fungsi barrier. Bow tie diagram, digunakan untuk menggambarkan elemen barrier.
Kinerja barrier dikaji berdasarkan 5 lima performance criteria availability, functionality, capacity, trigger event, dan response time. Hasil penelitian menunjukkan bahwa 21 dari keseluruhan skenario memiliki unacceptable risk dan membutuhkan perbaikan. Beberapa rekomendasi diusulkan kepada PT. XYZ.
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PT. XYZ is constructing a new onshore gas plant and targeted to be on stream by mid 2017. During detailed engineering, studies such as HAZOP, HAZID and SIL have specified technical barriers, but not organizational barrier, neither procedural nor human, which also contributing in safety implementation of startup and commissioning activities. Before startup, each unit within the gas plant should be thoroughly inspected and evaluated for its readiness and prevention of potential accidents, especially explosion and fire.

The purpose of this study was to analyze the availability and readiness of the safety barrier in preventing and mitigating the consequences of the hazardous event, i.e. flammable gas liquid release. This study identified initiating event that could lead to flammable gas liquid release, evaluated consequences barrier functions. Bow tie diagrams were used to draw barrier elements.
Performance of barriers were assessed by 5 performance criteria availability, functionality, capacity, trigger event, and response time. It was found that 21 of all scenarios were having unacceptable risk and need more improvement. Some recommendations were proposed.