

Analisis semi kuantitatif risiko kebakaran dan ledakan pada fasilitas pengolahan gas = Semi quantitative risk analysis event fire and explosion at gas process facility

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Abstrak

Risiko kebakaran dan ledakan mengakibatkan kerugian terhadap keselamatan pekerja, pencemaran lingkungan, kerusakan perangkat kerja dan kredibilitas perusahaan. Fasilitas gas memiliki risiko kebakaran dan ledakan karena natural gas merupakan highly flammable dari campuran metana (utama : 70-90%), etana dan sedikit senyawa lain. Oleh karena itu, sebagai dasar upaya pencegahan dan pengendalian terhadap konsekuensi yang ditimbulkan dari risiko kebakaran dan ledakan dengan menurunkan dampak/konsekuensi ketinggian yang bisa diterima (acceptable level) pada fasilitas pengolahan gas (separation system, gas processing system dan fuel gas system), diperlukan analisis semi-kuantitatif risiko kebakaran dan ledakan. Teknik yang digunakan adalah melakukan analisis data sekunder (studi HAZID, studi HAZOP, Bow-tie Analysis dan simulasi PHAST). Hasil penelitian ini sebagai dasar upaya mengetahui faktor-faktor dominan yang menyebabkan kejadian kebakaran dan ledakan pada fasilitas pengolahan gas. Dari hasil simulasi crystal ball didapat total forecast memiliki angka 4.30 dimana jika dilihat di matriks resiko maka berada dilevel medium risk yang berarti bahwa fasilitas pengolahan gas termasuk katagori risiko masih dapat diterima. Untuk sensitivity, perubahan tekanan (16.0%), perubahan suhu (15.9%) dan kelebihan tekanan (15.8%) merupakan faktor yang paling sensitif terhadap perubahan dibandingkan faktor-faktor lainnya. Selain itu, dapat membantu dalam menentukan rekomendasi yang tepat untuk diterapkan pada fasilitas pengolahan gas tersebut.

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Risk of fire and explosion resulted in the loss of the worker safety, environmental pollution, damage to the work and credibility of the company. Gas facility has a risk of fire and explosion because natural gas is a highly flammable mixture of methane (major: 70-90%), ethane and a bit of other compounds. Therefore, as a basis for prevention and control of the consequences arising from the risk of fire and explosion by reducing the impact / consequences to the level that can be accepted (acceptable level) with a precise cost on gas processing facilities (separation systems, gas processing system and fuel gas system), a semiquantitative analysis is required the risk of fire and explosion.

The technique used is to conduct a secondary data analysis (HAZID and HAZOP studies, Bow-tie Analysis and PHAST simulation). The results of this study as a basis for efforts to determine the dominant factors that cause the occurrence of fire and explosion at a gas processing facility. From the simulation results obtained crystal ball that total forecast has the number 4.30 which when seen in the risk matrix was at medium risk which means that the gas processing facility including the safe category/tolerable risk. For sensitivity, pressure changes (16.0%), themperature changes (15.9%) and excess pressure (15.8%), are the factors that are most sensitive to change than other factors. In addition, it can assist in determining the appropriate recommendations to be applied to the gas processing facility.