

Kajian ALARP dengan metode bow-tie LOPA pada studi kasus NGL Extraction Plant = ALARP review with bow-tie LOPA metode at NGL Extraction Plant

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Abstrak

Metode Bow-Tie Analysis merupakan metode analisa resiko yang memiliki keunggulan analisa yang lebih detail karena merupakan gabungan Fault Tree Analysis dan Event Tree Analysis, dan juga dalam hal penjabaran informasi lebih sederhana dan mudah untuk dimengerti. Namun, analisa Bow-Tie masih bersifat kualitatif dan guna meningkatkan keakuratan analisa Bow-Tie dapat dilakukan kuantifikasi LOPA (Layer of Protection Analysis), yang berdasarkan pada nilai Probability Failure Of Demand (PFD) dari setiap alat proses. Hasil kajian ini berupa evaluasi fasilitas proses sebuah NGL Extraction Plant, dengan output berupa rekomendasi bagi beberapa node yang tidak memenuhi kriteria ALARP (As Low As Reasonably Practicable) dan batas nilai TMEL (Target Mitigated Event Likelihood) sebesar 10^{-5} . Rekomendasi tersebut melingkupi penambahan IPL aktif dan IPL pasif hingga mencapai batas TMEL dan kriteria ALARP yang ingin dicapai.

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Bow-Tie Analysis is one of risk assessment method, which best at qualitative risk assessment based on its detail explanation combined from Fault Tree Analysis and Event Tree Analysis, and it also made as a simple explanation and easily understandable. But, Bow-Tie analysis still a qualitative method of analysis and in order to increase accuracy of this method, bow tie can be quatificated by LOPA method (Layer of Protection Analysis) which based on the value of Probability Failure Of Demand (PFD) from each process equipment. This review results an evaluation of NGL Extraction plant, with a recommendation as the output. The recommendation is the additional of IPL passive and active in oreder to achieve the parameter of ALARP (As Low As Reasonably Practicable) and limitation of TMEL (Target Mitigated Event Likelihood) as 10^{-5} .