

# Penentuan Nilai Safety Integrity Level dan Konfigurasi pada Safety Instrumented System di Mutiara Central Gas Plant PT. XXX = Determination of Safety Integrity Level Value and Configuration in the Safety Instrumented System at Mutiara Central Gas Plant PT. XXX

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## Abstrak

Safety Instrumented System (SIS) saat ini telah banyak dan bahkan wajib digunakan di berbagai sektor industri terutama minyak dan gas untuk mendeteksi hazard, melakukan tindakan penyelamatan dan mitigasi. SIS mempunyai nilai Safety Integrity Level (SIL) yang menentukan sistem tersebut sesuai dengan kriteria yang diperlukan. Pada tesis ini dibahas mengenai penentuan nilai SIL dan konfigurasi pada SIS di Mutiara Central Gas Plant PT.XX. Sesuai IEC 61508 dan IEC 61511, perlu adanya hazard risk assessment dimana metode HAZOP dan LOPA akan dipakai untuk menentukan target SIL tersebut, proses verifikasi desain dan konfigurasi SIS juga harus dilakukan terhadap target SIL. Dari hasil penelitian ini terdapat 15 SIF dengan SIL 1 dan 2 SIF dengan SIL 2 yang harus diterapkan untuk SIS di Mutiara Central Gas Plant dimana berdasarkan verifikasi, konfigurasi 1 out of 1 dapat mencapai persyaratan hingga SIL 2.

.....Safety Instrumented System (SIS) has now been numerous and moreover shall be used in various industrial sectors, especially oil and gas to detect hazards, carry out safety and mitigation actions. SIS has the value of Safety Integrity Level (SIL) which determines the system in accordance with the required criteria. In this thesis, will be discussed the determination of SIL value and configuration in SIS at Mutiara Central Gas Plant PT. XX. In accordance with IEC 61508 and IEC 61511, there is a need for hazard risk assessment where the HAZOP and LOPA methods will be used to determine the SIL target, the verification process of the design and configuration of SIS shall also be carried out against the SIL target. The result of this research, there are 15 SIL 1 and 2 SIL 2 shall be applied for SIS in Mutiara Central Plant where based on verification, configuration 1 out of 1 of Safety Instrumented Function can achieve up to SIL 2 requirement.