Evaluasi Sistem Proteksi Petir Eksternal di Perusahaan Minyak dan Gas Bumi (Studi Kasus Storage Tank BUT SIPL) = Evaluation of External Lightning Protection Systems at Oil and Gas Companies (Case Study of Storage Tank at BUT SIPL)

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Abstrak

Penelitian ini bertujuan untuk mengevaluasi efektivitas sistem proteksi petir yang terpasang pada storage tank di plant BUT SIPL, dengan membandingkannya terhadap standar proteksi petir yang berlaku, yaitu SNI 03-7015, NFPA 780, IEC 62305-3, dan NF C 17-102. Metodologi yang digunakan mencakup analisis zona perlindungan petir, evaluasi risiko sambaran, serta studi literatur. Hasil penelitian menunjukkan bahwa sistem proteksi pada kilang minyak telah memenuhi kriteria dengan metode non-konvensional, namun belum sesuai dengan metode konvensional. Oleh karena itu, diperlukan penambahan empat terminasi udara, penyesuaian konduktor penyalur, dan sistem pembumian. Sementara itu, tangki LPG dinilai belum sepenuhnya terlindungi, sehingga perlu dirancang ulang dengan menambahkan 12 terminasi udara baru, disertai penyesuaian konduktor penyalur dan pembumian. Penelitian ini memberikan rekomendasi untuk meningkatkan efektivitas sistem proteksi petir guna meminimalkan risiko kerusakan dan kebakaran, serta memastikan keselamatan operasional plant. Hasil ini diharapkan menjadi dasar pengembangan sistem proteksi petir di masa depan untuk perusahaan BUT SIPL.

.....This study aims to evaluate the effectiveness of the lightning protection system installed on the storage tanks at the BUT SIPL plant, with a primary focus on comparing the existing system to relevant lightning protection standards, including SNI 03-7015, NFPA 780, IEC 62305-3, and NF C 17-102. The methodology employed encompasses an analysis of the lightning protection zones, an evaluation of lightning strike risks, and a review of pertinent literature. The findings indicate that the lightning protection system at the oil refinery complies with non-conventional methods but does not fully conform to conventional standards. As such, the addition of four air terminals, modifications to the down conductors, and adjustments to the grounding system are recommended. Similarly, the LPG tanks were found to lack complete protection and require a redesign involving the installation of 12 additional air terminals, along with adjustments to the down conductors and grounding systems. This research provides recommendations to enhance the effectiveness of the lightning protection system, aiming to minimize the risks of damage and fire while ensuring the operational safety of the plant. These findings are intended to serve as a foundation for future improvements in lightning protection systems at BUT SIPL.