Kajian Nilai Emisi pada Fasilitas Produksi Terapung dengan Metode Dispersi Terbalik (Reverse-Dispersion) = Study of Emission Values at Floating Production Facilities using the Reverse-Dispersion Method

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Abstrak

Industri Minyak dan Gas merupakan salah satu industri dengan kontribusi penghasil emisi yang cukup signifikan bagi akumulasi gas rumah kaca. Salah satu gas yang cukup memberikan dampak buruk yang signifikan saat berada di atmosfer adalah gas Metana. Sebagai upaya dalam menimalisasi emisi gas Metana, industri minyak dan gas mulai melakukan program reduksi emisi, salah satunya dengan melakukan evaluasi terhadap nilai emisi pada fasilitas terkait. Emisi dapat diperkirakan dengan beberapa cara (dari banyak referensi), seperti Pendekatan Faktor Emisi Rata-Rata Tingkat Fasilitas, Pendekatan Faktor Emisi Rata-Rata Tingkat Peralatan, dan Pendekatan Dispersi Terbalik. Hasil rata-rata tingkat fasilitas lebih tinggi dibandingkan rata-rata tingkat peralatan. Dari hasil perhitungan terdapat perbedaan sebesar 29% antara Rata-rata Pendekatan Faktor Emisi Tingkat Fasilitas vs. Rata-rata Faktor Emisi Tingkat Peralatan. Sedangkan metode dispersi terbalik akan memberikan hasil aktual kebocoran berdasarkan kegiatan pemantauan dan pengukuran nilai LEL yang dilakukan teknisi di lapangan. Namun pendekatan dispersi terbalik memerlukan data analisis total emisi fugitive yang lebih banyak dan perbaikan lebih lanjut agar menghasilkan estimasi yang lebih akurat. Setelah dilakukannya estimasi terhadap nilai emisi, perbaikan dapat diterapkan dengan memodifikasi peralatan sesuai Metode Teknologi Terbaik (Best Available Technique) dimana perkiraan efisiensi menghasilkan reduksi nilai emisi hingga hampir 100%. Namun penerapannya memerlukan analisis biaya dan manfaat lebih lanjut (total keuntungan-kerugian/harga karbon vs total investasi) karena nilai investasinya akan sangat tinggi.

.....The oil and gas industry is one of the industries with a significant emission-producing contribution to the accumulation of greenhouse gases. One gas that has a significant negative impact when it is in the atmosphere is methane gas. As an effort to minimize methane gas emissions, the oil and gas industry has begun carrying out emission reduction programs, one of which is by evaluating the emission values at related facilities. Emissions can be estimated in several ways (from many references), such as the Facility Level Average Emission Factor Approach, the Equipment Level Average Emission Factor Approach, and the Reverse Dispersion Approach. The average facility level results are higher than the average equipment level. From the calculation results, there is a difference of 29% between the average Emission Factor Approach at Facility Level vs. Average Equipment Level Emission Factor. Meanwhile, the reverse dispersion method will provide actual leak results based on monitoring activities and measuring LEL values carried out by technicians in the field. However, the reverse dispersion approach requires more total fugitive emission analysis data and further improvements to produce more accurate estimation. After estimating the emission value, improvements can be implemented by modifying the equipment according to the Best Available Technique where the estimated efficiency results in a reduction of the emission value for almost 100%. However, its implementation requires further cost and benefit analysis (total profit-loss/carbon price vs total investment) because the investment value will be very high.