

INTISARI

STUDI POLA DISPERSI EMISI GAS SO₂, NO₂, CO DARI CEROBONG KILANG PT PERTAMINA (PERSERO) RU V BALIKPAPAN

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Pemodelan terhadap emisi gas buang (SO₂, NO₂, dan CO) cerobong kilang PT Pertamina (PERSERO) RU V Balikpapan, telah dilakukan dengan menggunakan model Gaussian Plume melalui perangkat lunak Screen3. Tujuan dari penelitian ini adalah untuk mengetahui hasil pemodelan dispersi emisi gas buang yang dipengaruhi oleh kecepatan angin dan kelas stabilitas atmosfer, serta pada skenario kasus terburuk. Selain itu juga untuk mengetahui kemungkinan terjadinya efek tarikan gedung dikawasan kilang, memetakan distribusi persebaran emisi gas buang hasil pemodelan, serta mengetahui dampak emisi gas buang hasil pemodelan terhadap kesehatan manusia berdasarkan nilai standar baku mutu yang berlaku beserta upaya mitigasi penanggulangan resiko.

Hasil penelitian menunjukkan bahwa terdapat pengaruh dari kecepatan angin dan stabilitas atmosfer terhadap variasi hasil pemodelan. Semakin tinggi kecepatan angin dan semakin stabil suatu atmosfer, maka nilai konsentrasi yang dihasilkan akan semakin rendah. Pemodelan pada skenario kasus terburuk, menghasilkan kemungkinan nilai konsentrasi terbesar yang mungkin terjadi dibandingkan dengan skenario pemodelan pada kecepatan angin dan stabilitas tertentu. Berdasarkan hasil pengukuran jarak dari cerobong terhadap struktur disekitarnya, perhitungan nilai ketinggian cerobong GEP, serta luasan area pengaruh dari setiap struktur, cerobong CCR memiliki kecenderungan terjadi efek tarikan gedung. Peta persebaran hasil pemodelan digambarkan mengikuti arah angin dominan, yaitu ke arah Selatan dan Utara kilang. Perbedaan besaran persebaran nilai konsentrasi digambarkan pada perbedaan warna. Semakin stabil kondisi stabilitas atmosfer, konsentrasi tinggi akan mengarah semakin jauh dari kilang. Keseluruhan nilai hasil pemodelan menunjukkan nilai konsentrasi yang berada di bawah nilai baku mutu bila didasarkan pada PP No.41 tahun 1999. Mitigasi penanggulangan resiko diantaranya melalui pemantauan rutin oleh pihak industri dan pemerintah mengenai udara emisi dan udara ambient di lingkungan kilang dan melakukan sistem pengendalian udara emisi dan udara ambient pada kilang, melalui kebijakan – kebijakan untuk pengurangan resiko kecelakaan industri.

Kata kunci: *gaussian plume*, *Screen3*, dispersi, mitigasi, cerobong asap.

ABSTRACT

THE STUDY ON DISPERSION PATTERN EMISSION GAS SO₂, NO₂, CO OF REFINERY STACKS PT PERTAMINA (PERSERO) RU V BALIKPAPAN

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Modelling of the exhaust emissions (SO₂, NO₂ and CO) refinery stacks PT Pertamina (Persero) RU V Balikpapan, has been done using Gaussian Plume models via software SCREEN3. The purpose of this study was to determine the results of dispersion modeling of emissions influenced by wind speed and atmospheric stability class, and in the worst case scenario. It is also to determine the possibility of the building downwash in the area of refinery, map the distribution of exhaust emissions dispersion modeling results, and determine the impact of exhaust emissions modeling results to human health is based on the value of the applicable quality standards as well as risk reduction mitigation efforts.

The results showed that there is an influence of the wind speed and atmospheric stability to variations in the modeling results. The higher the wind speed and a more stable atmosphere, the concentration of the resulting value would be lower. Modeling the worst case scenario, will generate the largest possible concentration values occur compared with scenario modeling on wind speed and a certain stability. Based on the results of measurements of the distance from the stacks to the surrounding structures, calculating the value of GEP height of the stacks, as well as the size of the area of influence of each structure, the stack CCR has a possibility of the building effect. Map dispersion modeling results are described following the predominant wind direction, namely the southern and northern refinery. Differences in the amount of the distribution of concentration values depicted in difference color. The more stable atmospheric stability, high concentrations will lead to more distant from the refinery. Overall value of the modeling results indicate that the concentration values are below the quality standard would be based on PP No.41 of 1999. Mitigating risk reduction including through regular monitoring by the industry and government regarding air emissions and ambient air in the plant environment and perform air-handling systems emissions and ambient air at the refinery, through policy for reduction of the risk of industrial accidents.

Key Words: gaussian plume, dispersion, Screen3, mitigation, stack