# Pengaruh Wax Content dan Light Component (C6) pada Komposisi Minyak Mentah terhadap Pengendapan Wax menggunakan Simulasi Flow Assurance = Effect of Wax Content and Light Component (C6) in Crude Oil Composition on Wax Deposition using Flow Assurance Simulation

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Abstrak

Pada sistem transportasi minyak mentah melalui sistem perpipaan, sering dijumpai adanya masalah yang dapat mengganggu pendistribusian minyak mentah. Hal ini umumnya disebabkan oleh terbentuknya wax di sepanjang pipa distribusi. Adanya wax dapat mengganggu proses pendistribusian fluida sehingga flow assurance tidak tercapai. Oleh karena itu, prediksi karakteristik wax yang tepat sangat dibutuhkan untuk melakukan pengendalian terhadap pengendapan wax dalam pipa agar tercapai flow assurance. Penelitian ini bertujuan untuk memprediksi karakteristik pengendapan wax dengan menganalisa pengaruh variasi wax content dan penambahan light component pada komposisi minyak mentah. Kandungan wax content pada komposisi minyak mentah divariasikan pada persentase 5%, 10% dan 15% untuk dievaluasi pengaruhnya terhadap pengendapan wax. Selanjutnya, dilakukan variasi penambahan light component C6 sebagai upaya mitigasi pengendapan wax pada waxy crude oil tersebut dengan variasi penambahan sebesar 20%, 30%, 50% dan 100% dari komposisi awal light component C6 dalam minyak mentah. Simulasi dilakukan dengan menggunakan perangkat lunak aliran multifase untuk mendapatkan profil karakteristik pengendapan wax pada pipa. Dari hasil simulasi flow assurance didapatkan hasil bahwa wax content berbanding lurus terhadap ketebalan endapan, wax appearance temperature (WAT), total padatan terlarut, dan laju pengendapan wax. Penambahan light component C6 dengan persentase 100% mampu mengurangi ketebalan endapan wax sebesar 79,27%; 33,42%; dan 4,91% pada variasi wax content 5%; 10%; dan 15%. Penambahan light component memenuhi kelayakan secara teknis karena dapat menjamin aliran di dalam perpipaan dan menekan pertumbuhan ketebalan endapan wax di bawah 5 mm sehingga dapat mengurangi frekuensi penggunaan pigging pada pipa.

.....In the crude oil transportation system through the pipeline system, problems that can interfere with the distribution of crude oil are often encountered. This is generally caused by wax build-up along the distribution pipe. The presence of wax can interfere the fluid distribution process so that flow assurance is not achieved. Therefore, the correct prediction of wax characteristics is needed to control the wax deposition in the pipe in order to achieve flow assurance. This study aims to predict the characteristics of wax deposition by analyzing the effect of wax content and the addition of light components C6 in the crude oil composition. The wax content in the crude oil composition was varied at a percentage of 5%, 10% and 15% to evaluate its effect on the thickness and rate of wax deposition. Furthermore, variations of light components C6 addition to the waxy crude oil are carried out with additional variations of 20%, 30%, 50% and 100% of the initial value of the light component composition in the crude oil. The simulation was carried out using multiphase flow software to obtain the characteristic profile of wax deposition on the pipe. From the flow assurance simulation results, it was found that wax content was directly proportional to the wax thickness, wax appearance temperature (WAT), total dissolved solids, and wax deposition rate. The

addition of light component C6 with a percentage of 100% was able to reduce the thickness of the wax deposition by 79.27%; 33.42%; and 4.91% for the variation of the wax content of 5%; 10%; and 15%. The addition of light component meets technical feasibility because it can ensure flow assurance in the pipeline and reduce the thickness of the wax deposition below 5 mm so as to reduce the frequency of using pigging on the pipe.