RINGKASAN

Lapangan NANO terletak di area lepas pantai wilayah kerja Kalimantan Timur yang menjadi bagian dari Lapangan Unitisasi Attaka dan akan berakhir kontrak wilayah kerjannya pada tahun 2038. Sesuai dengan peraturan pemerintah bahwa Kontraktor Kontrak Kerja Sama (KKKS) wajib untuk melaksanakan dan mencadangkan dana untuk kegiatan pasca operasi sebelum atau pada saat berakhirnya kontrak kerja sama. Untuk itu perencanaan teknik dan analisa estimasi biaya *Abandonment and Site Restoration* (ASR) di Lapangan NANO perlu dilakukan baik untuk penutupan sumur dan pembokaran *platform* serta untuk menentukan strategi pekerjaan dalam kegiatan ASR tersebut.

Metodologi yang digunakan pada penelitian ini mengacu pada PTK-040/ SKKMA0000/2018/S0 Revisi 01, dimana perhitungan estimasi biaya-biaya ASR meliputi biaya perencanaan teknis, perizinan, penutupan sumur, pembongkaran fasilitas, transportasi, penyimpanan dan *site restoration*. Kemudian dari estimasi perhitungan biaya tersebut dilakukan penyesuaian terhadap biaya yang akan dikeluarkan pada tahun dilakukannya ASR dengan mempertimbangkan eskalasi biaya sebesar 2.5 %. Selanjutnya dari hasil analisa ini digunakan dalam menentukan strategi pekerjaan ASR secara keteknikan untuk memperoleh estimasi biaya yang efisien.

Berdasarkan hasil analisa perhitungan 8 (delapan) komponen biaya ASR di Lapangan NANO didapatkan besarnya biaya untuk *Engineering Design* (US$ 124,631.63), *Permitting and Regulation* (US$ 39,990.81), *Well* P&A 9 (sembilan) sumur (US$ 6,630,013.90), *Platform Decommissioning* (US$ 3,104,051.88), *Pipeline Decommissioning* (US$ 354,254.62), *Transportation* (US$ 57,694), *Temporary Disposal* (US$ 682,355.04), dan *Site Clearance* (US$ 240,621.64). Dimana item pekerjaan yang signifikan terhadap total biaya ASR adalah *Well* P&A dan *Platform Decommissioning* (86.65% dari total *cost*). Dengan tingkat suku bunga 2.5% maka pada tahun dilaksanakannya ASR (tahun 2038) biaya ASR untuk strategi *Well* P&A *conventional-stand alone* dan *complete removal* sebesar US$ 25,264,277.52, serta untuk strategi *Well* P&A *rigless-campaign* dan *partial removal-rig to reefs* sebesar US$ 18,407,583.80. Strategi *well* P&A *rigless-campaign* dan *partial removal-rig to reefs* memberikan biaya ASR yang efisien.

Kata Kunci : *abandonment and site restoration* (ASR), *well plug and abandonment* (P&A), *platform*, *decommissioning*.

ABSTRACT

NANO Field is located on the East Kalimantan offshore working area as part of Attaka Unitisation Field where the contract will be ended in 2038. By referring to the government regulation, all Cooperation Contract Contractors (KKKS) are obliged to reserve funds to carry out all post-field development activities before or when the contract of work period has expired to restore the work area of upstream oil and gas businesses in Indonesia. Therefore, an integrated Abandonment and Site Restoration (ASR) technical plan and fund estimation are required for well plug and abandonment, the platform removal, and the optimum strategies for the activities.

The methodology used in this research refers to the Working Guidelines (Pedoman Tata Kerja/PTK) Number 040/SKKMA0000/2018/S0 Revision 01, where the ASR fund calculation includes engineering design cost, permitting and regulation cost, well plugged and abandonment cost, dismantling cost, transportation cost, storage cost, and site restoration cost. After the cost estimation calculation of each component of ASR is done, the costs are escalated to the ASR following years with assumption that the escalation fee is 2.5% per year. Then, technical analysis is performed to obtain the most effective and efficient cost estimation for the ASR program.

Based on technical and cost analysis of ASR in the NANO Field, there are 8 (eight) items of ASR funds in the field which are: engineering design (us$ 124,631.63), permitting and regulation (us$ 39,990.81), well plug and abandonment of 9 (nine) wells (us$ 6,630,013.90), platform decommissioning(us$ 3,104,051.88), pipeline decommissioning(us$ 354,254.62), transportation(us$ 57,694), temporary disposal(us$ 682,355.04), also site clearance and verification(us$ 240,621.64); where the most significant items are well plugged and abandonment dan platform decommissioning that required 86.65% of total ASR cost. By considering the 2.5% of interest rate, when the ASR program will be performed (in 2038), the ASR fund required for well plug and abandonment conventional-stand alone dan complete removal strategy is US$ 25,264,277.52, and the ASR fund required for well plug and abandonment rigless-campaign and partial removal-rig to reefs strategy is US$ 18,407,583.80. Furthermore, conclude that well plug and abandonment rigless-campaign and partial removal-rig to reefs strategy gives the most efficient ASR fund for NANO Field.

Keywords : abandonment and site restoration (ASR), well plug and abandonment (P&A), platform, decommissioning.