# *ABSTRACT*

*Although produced water injection pump system is not a main system in oil and gas production, this system becomes very important because failure that occurs in the injection pump can cause pollution and loss of production opportunity (LPO). Injection pump system of Pertamina Exploration & Production (PEP) Bunyu Field often suffer failure in which the maintenance performance is measured by the availability of that have a low number and affect to the increase in LPO (undesirable). The research aims to optimize the effectiveness of PEP Bunyu Field injection pump by implementation of measuring overall equipment effectiveness (OEE) and analysis of six big losses. This research is descriptive-quantitative study conducted by studying the daily report production and maintenance, do observation, interviews and focus group discussion (FGD). Causes of problem is analyzed by fishbone diagram while the dominant causes (as suggestion for improvement) is determined based on Risk Priority Number (RPN) in Failure Mode and Effect Analysis (FMEA). According to the analysis, the problem components in which improvement proposed are suction & discharge piping of pump, pump characteristic, power supply characteristic, setting of suction or discharge valve and part quality of pump. The improvement is conducted using 5W 1H concept. The results show that there are two big losses that affect the pump effectiveness of produced water injection system namely breakdown losses and reduced speed losses. As a result of improvement, the OEE score rises. The other result, availability has passed the company's target and performance increases.*

*Keywords: OEE, Six Big Losses, Fishbone Diagram, FMEA & RPN and 5W 1 H.*

# ABSTRAK

Meskipun sistem pompa injeksi air terproduksi bukan sistem utama dalam proses produksi migas, sistem ini menjadi sangat penting karena kegagalan yang terjadi pada pompa injeksi dapat menimbulkan pencemaran dan *loss production opportunity* (LPO). Sistem pompa injeksi Pertamina Eksplorasi & Produksi Field Bunyu sering mengalami kerusakan dimana kinerja pemeliharaan yang diukur dengan *availability* memiliki angka yang rendah dan berdampak kepada peningkatan LPO (tidak diinginkan). Tujuan penelitian ini adalah untuk mengoptimasi kinerja pompa injeksi PEP Field Bunyu melalui penerapan pengukuran *overall equipment effectiveness* (OEE) dan analisis *six big losses.* Penelitian ini merupakan penelitian deskriptif-kuantitatif dilakukan dengan mempelajari laporan harian produksi dan pemeliharaan, melakukan obervasi, wawancara dan *focus discussion group* (FGD). Penyebab masalah dianalisis dengan *fishbone diagram* sedangkan penyebab dominan (sebagai usulan untuk perbaikan) ditentukan berdasarkan *Risk Priority Number* (RPN) pada *Failure Mode and Effect Analysis* (FMEA*).* Berdasarkan analisis ini, komponen-komponen bermasalah dimana perbaikan diusulkan adalah pemipaan *suction* dan *discharge* pompa, karakteristik pompa, karakteristik sumber listrik, pengaturan *suction* dan *discharge valve* serta kualitas *sparepart* pompa. Perbaikan terhadap penyebab dominan menggunakan konsep 5W 1H. Hasil penelitian menunjukkan bahwa terdapat dua kerugian besar yang mempengaruhi keefektivan pompa pada sistem injeksi air terpoduksi berturut-turut yaitu *breakdown lossses* dan *reduced speed losses*. Setelah usulan dan implementasi perbaikan dilakukan, nilai OEE meningkat. Hasil lainnya, *availability* sudah melewati target perusahaan dan *performance* mengalami kenaikan.

Katakunci: OEE*, Six Big Losses, Fishbone Diagram,* FMEA & RPN dan 5W 1 H.