

Pemerintah sangat agresif dalam menghadirkan energi baru terbarukan menggantikan energi fosil, selain karena semakin berkurangnya produksi migas, juga komitmen menghadirkan energi hijau. Biodiesel salah satu dari alternatif tersebut dan cukup masif diimplementasikan oleh Pemerintah. Sejak tahun 2016 biodiesel B20 telah diaplikasikan, kemudian pada tahun 2020 Pemerintah juga telah menetapkan penggunaan biodiesel B30. Industri migas dalam hal ini *production sharing contract* milik Chevron yang beroperasi di lapangan West Seno Bangka di Selat Makassar turut mendukung implementasi biodiesel untuk operasi pendukung peralatan produksi dan keselamatan pada area tersebut. Meskipun memiliki beberapa karakteristik yang hampir sama dengan minyak solar, namun sifat higroskopis, pelarutan dan mudah teroksidasi yang dimiliki biodiesel menjadikan biodiesel memiliki potensi presipitasi yang tinggi dan dapat memblokir filter bahan bakar. Kondisi ini yang dialami oleh West Seno Bangka, sehingga setelah implementasi biodiesel permasalahan muncul pada operasi di lapangan, di antaranya kegagalan mesin penunjang beroperasi, meningkatnya secara signifikan penggantian *main fuel filter* serta turunnya *reliability* unit peralatan penunjang operasi yang menggunakan bahan bakar biodiesel.

Atas dasar tersebut, penulis melakukan pengujian *particle size distribution* atau *cleanliness* sesuai dengan ASTM D 7619-17 dan melakukan pengujian *Filter Blocking Tendency* (FBT) sesuai dengan ASTM D 2068-20 untuk melihat perilaku presipitasi seiring waktu penyimpanan pada tangki diesel di lapangan West Seno Bangka, dan kemudian menambahkan zat aditif komersial Biostable untuk mencegah presipitasi dan menjaga stabilitas wujud cair dari biodiesel B30 tersebut.

Hasil dari observasi didapatkan presipitasi biodiesel B30 West Seno Bangka selama pengamatan 60 hari di skala laboratorium, peningkatan nilai FBT dan instabilitas dengan meningkatnya nilai *cleanliness* pada *bottom tank*. Penambahan zat aditif Biostable dengan dosis optimum 500 ppm baik pada skala laboratorium maupun implementasi lapangan, mampu menurunkan nilai FBT hingga 78%, dan menjaga stabilitas biodiesel dengan nilai partikel yang rendah baik pada ukuran  $>4\ \mu\text{m}$ ,  $>6\ \mu\text{m}$  dan  $>14\ \mu\text{m}$ , sehingga penambahan zat aditif ini dapat menaikkan *reliability* operasi.

## ABSTRACT

West Seno Bangka is an oil and gas deep water field operation located in Makassar Street offshore East Kalimantan. The first production of oil was in 2003. The production facilities are equipped in Floating Production Unit (FPU). Some of the supporting equipment are utilized diesel fuel for operational. However, since utilization biodiesel B30 instead of fossil fuel or diesel fuel, some of the equipment such crew boats, crane, slick line's power pack and diesel generator have experienced repetitive failure and significantly increased of main fuel filter replacement. The main cause of filter blocking that led to engines failure has been identified in some previous research. Afton chemical research in 2018 released that 62% filter blocking coming from glycerides in biodiesel. Five hundred kl volume capacity of biodiesel is consuming in 3-4 months for operational in West Seno Bangka. Biodiesel is biodegradable and has lower oxidation stability, and longer period of storage time will also be contributing many precipitations and tend to form insoluble deposit causing filter blocking.

Filter Blocking Tendency (FBT) analysis based on ASTM D2068-20 and particle size distribution (PSD) analysis based on ASTM D 7619-17 of West Seno's B30 was conducted to observe increment of blocking filter possibility and its stability toward time function. The first 30 days are observed on the top sample and the second 30 days observed on bottom sample and mixing sample. The result shown that FBT top sample decreased from 2.36 to 1.38 and particle distribution has improvement stability from the 0 day in ISO code 23/23/21 to 22/20/19 in the 30th days, however FBT for bottom sample and mixing sample tend to increase as well as particle distribution. It is confirmed that agglomeration persisted in the bottom tank and create some issues in biodiesel operational, since distribution of fuel system is coming from the bottom of the daily tank. Additive commercial Biostable was applied to reduce the FBT and to maintain the stability of B30, by applying 500 ppm dosage. Comparing B30 and B30 with additive in every 10 days observation until 60 days, shown that additive capable to reduced significantly FBT from average 8.43 to 1.83 or 78.4% decreasing from the initial FBT. Good filterability and improvement stability post adding additive will reduce filter replacement and increase equipment reliability.