

RINGKASAN

Lapangan S adalah salah satu lapangan yang berada di wilayah kerja PT Pertamina Hulu Sanga-Sanga (PHSS). Lingkungan pengendapan reservoir di lapangan ini adalah *fluvial* dan *deltaic* sehingga bentuk reservoir terbagi menjadi bar dan channel dengan ukuran reservoir yang sangat beragam. Setiap kali dilakukan pengeboran di lapangan S, umumnya ditemukan reservoir baru. Setiap kali ditemukan reservoir baru, diperlukan evaluasi perhitungan *Initial Gas in Place* (IGIP) untuk menentukan *reserve* gas yang dapat diproduksi dari reservoir tersebut. Masalah yang terjadi pada lapangan S adalah belum ada data tekanan reservoir setelah reservoir baru tersebut diproduksi.

Dikarenakan data yang tersedia masih sangat terbatas, perlu dilakukan *deliverability test* agar memperoleh data sumuran yang dapat digunakan dalam perhitungan IGIP. Salah satu metode *deliverability test* yang dilakukan adalah *back pressure test*. Metode ini dilakukan dengan memberikan gangguan pada sumur S-18X melalui perubahan laju alir gas, kemudian dilakukan pengambilan data *flowing bottom hole pressure*. Selanjutnya, data tersebut dianalisis dengan menggunakan *nodal analysis* untuk memperoleh data tekanan reservoir. Selanjutnya, metode P/z digunakan untuk menentukan besaran IGIP reservoir G-8Y. Setelah itu, *remaining reserve* dari reservoir tersebut dapat dihitung dengan mempertimbangkan *Estimate Ultimate Recovery (EUR)* dari sumur eksisting. Pendekatan ini belum banyak ditemukan dalam publikasi ilmiah, karena sebagian besar penelitian hanya membahas *deliverability test* tanpa penentuan cadangan, atau sebaliknya penentuan cadangan tanpa memanfaatkan data *deliverability test*.

Berdasarkan hasil pengujian *back pressure test* dan menggunakan metode *material balance p/z*, diperoleh IGIP reservoir G-8Y sebesar 3.62 BCF. Sumur S-18X ini akan memperoleh EUR sebesar 3.1 BCF dan *recovery factor* sebesar 85.6% dengan menggunakan teknologi *wellhead compressor*. Berdasarkan hasil perhitungan diatas, metode *back pressure test* dapat dilakukan pada sumur dengan reservoir yang memiliki data terbatas yaitu tidak adanya data tekanan reservoir setelah diproduksi.

Kata Kunci: *bar, channel, IGIP, remaining reserve, back pressure test, p/z*

ABSTRACT

Field is one of the fields located within the working area of PT Pertamina Hulu Sanga-Sanga (PHSS). The main production of the S Field is gas, as most of the reservoirs in this field are gas reservoirs of bar and channel types. Each drilling activity in S Field generally leads to the discovery of new reservoirs. Each newly discovered reservoir requires an evaluation of the Initial Gas in Place (IGIP) to determine the producible gas reserves. However, a major challenge in S Field is the absence of post-production reservoir pressure data for newly developed reservoirs.

Due to the very limited availability of data, a deliverability test is required to obtain well data that can be utilized for IGIP estimation. One of the deliverability test methods applied in this study is the back pressure test. This method was conducted by inducing flow disturbances in well S-18X through variations in gas flow rates, followed by the acquisition of flowing bottom-hole pressure data. The acquired data were subsequently analyzed using nodal analysis to estimate reservoir pressure. The P/z material balance method was then applied to determine the IGIP of the G-8Y reservoir. Subsequently, the remaining reserves of the reservoir were estimated by considering the Estimated Ultimate Recovery (EUR) of the existing well. This integrated approach is rarely reported in the literature, as most studies focus either on deliverability testing without reserve estimation or on reserve estimation without utilizing deliverability test data.

Based on the results of the back pressure test and the application of the P/z material balance method, the IGIP of the G-8Y reservoir was estimated to be 3.62 BCF. Material balance analysis indicates that the reservoir is expected to yield an EUR of 3.1 BCF with a recovery factor of 85.6% through the application of wellhead compressor technology. Based on these results, the back pressure test method is shown to be applicable for wells with reservoirs characterized by limited data availability, particularly in cases where post-production reservoir pressure data are not available.

Keywords: bar, channel, IGIP, remaining reserve, back pressure test, p/z