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Optimization of Low Pressure Gas Compression Plant (LPGP) Using HYSYS Simulation "Abu-Attifel Field – Libya"

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ABSTRACT

Low Pressure Gas Compression Plant (LPGP) at Abu-Attifel field production process typically is the main process in this field; where it consists of three Compression stages and intercoolers are normally provided between stages to reduce the power requirements as well as to lower the gas temperature that may become undesirably high. However, another possible scenario to reduce the required power could be changing of equipment arrangement. In this paper, (LPGP) at Abutifel field was simulated by using HYSYS simulator 7.2, and the objective is to find the effects of equipment arrangement on the liquids recovery and to find the optimum equipment arrangement that results in minimization of compression horsepower where three different scenarios used and compared with the base case to reflect the expected improvement. The obtained results show that the liquid produced in the first scenario reaches 3556 BBLPD with liquid recovery improvement with approximately 9 vol %, where as in the second case the produced liquid reaches 3564 BBLPD with an improvement percent approximately equal to 9.3 vol % in liquid recovery in comparison to the base case. However, in third scenario, a reduce of liquid produced by approximate 50 vol % was noticed and approximately 8.5% less than power that is needed for the cases 1 & 2 and to sum up, the rearrangement of coolers and compressors in (LPGP) results in an increase of condensates recovery from plant and a reduction of total horse power consumption except scenario 3.

Keywords: Liquid Recovery, Gas Compression, HYSYS Optimization.