

THIS IS A PREPRINT --- SUBJECT TO CORRECTION

ISOLATED WATERFLOOD

By

Eugene C. Campbell, Mid-Continent Supply Co.

ABSTRACT

Who: Standard Oil Co. of Texas; When: December, 1963; and Where: Twenty [2] miles southwest of Dalhart, Tex. The location is in the Standard of Texas Rehm [Granite Wash], Hartley County, Tex.

PROBLEM To construct a waterflood station in an isolated area where the supply of gas has been depleted beyond the amount necessary for use as fuel. The cost of electricity was prohibitive due to the fact the nearest source of supply is Dalhart, Tex. and the cost of the line would have been \$23,000 plus approximately \$1,080 per month to supply 175 KW 3 phase 440 volt A.C. power for one 50 H.P. injection pump motor, one 15 H.P. source well pump, and 5 - 25 H.P. pumping unit motors. Also required in this station is an automation system to operate the plant 24 hours a day without a full time attendant.

SOLUTION

Mid-Continent Supply Co. was awarded the contract on a bid basis to construct this waterflood station. A Cummins diesel generator set was selected to supply the power. A sample of the oil and a laboratory report by a local firm were sent to the engine company for recommendations as to how the oil should be handled and determine if it would be satisfactory fuel for the diesel engine. The laboratory report showed the oil to be 42.8 gravity and the sulphur content .057925 per cent by weight. We received confirmation from Cummins Engine Co. that if the gravity is between 15 and 45 API at 60 F and the sulphur does not exceed 3 per cent of weight, the oil would be satisfactory for fuel. They did, however, recommend the oil be processed through a centrifuge machine and then splashed to atmosphere. This will remove the BS and W and sulphur.

To supply each of the two injection wells with 1,000 BWPD at 1,200 PSI, a 3 in. 60 H.P. triplex plunger pump was selected. The pump is fitted with aluminum-bronze fluid end and ceramic plungers.

Due to the very cold weather conditions under which the equipment will be operating, the water well is also located inside the building. The well is 400 ft deep and water is produced from the Ogallala Zone. The pump supplied is a vertical turbine type powered by a 15 H.P. electric motor.

The plant is equipped with automatic controls to perform the following: Stop the injection pump on high or low discharge water pressure, low water level in supply tank, or low oil level in injection pump.

The water well pump is started and stopped by a high-low level switch control that also shows the level in the tank at all times.

The engine is equipped with a governor and regulator to maintain constant voltage and amperage. It is also equipped with low oil shutdown, high temperature shutdown, oil level control and over speed safety shutdown.

Fuel is piped from the lease sales tanks through an engine heat exchanger to warm the oil before it enters the centrifuge machine. The oil then goes to the 100 bbl storage tank that is equipped with a high level float switch that will stop the flow of oil and an indicator light will show the operator that he has a full tank of fuel oil. Another indicator light will show low level so the operator may restart the centrifuge. It will be necessary to restart this cycle approximately every nine days.