

Maximizing Recovery of Hydrocarbons by Efficient Thermal Methods

Zubair Aziz¹, Fatima Zahid¹, Muneer Ahmed¹, and Shahpoor Azam Kakar¹

¹ Baluchistan University of Information Technology Engineering & Management Sciences

Abstract

Recovery of hydrocarbons is the key to oil industry, the more the hydrocarbons more develop will be oil industry. Mostly production in the world is characterized by large and heavy oil reservoirs which govern some depletion processes as well. Normally primary drive mechanisms play a stunning role in the recovery of hydrocarbons, but for some reservoirs challenging to the primary methods we use secondary recovery methods for somewhat betterment of recovery. Heavy oil and heavy oil reservoirs are proved to be the most challenging for primary and secondary methods because of the capillary forces and viscous forces present there. High viscosity does not allow the hydrocarbons to recover with ease of the methods and we cannot extract the hydrocarbons up to the mark. For such reservoirs we are using EOR (Enhanced Oil Recovery) methods. We have several diversions of EOR, and in this paper we are going to apply EOR methods in the form of thermal methods. This study is an attempt to extrapolate the potential of Thermal enhanced oil recovery to be deployed in candidate reservoirs. Thermal recovery methods include SAGD, Cyclic Steam Stimulation (CSS) and in-situ combustion to cope with the heavy oil reservoirs. The world is using 60-70% of energy from natural resources of the earth and for it must be required to extract every barrel of oil. Such reservoirs lead us to the most systematic way and approach of EOR methods. The processes focus on screening criteria and provide facilities for efficient recovery of heavy oil bitumen. Process design of surface facilities requires optimization to improve efficiency of oil produced.

This paper explains each method for thermal recovery along with surface facilities and screening criteria. It explains the research oriented study of heat integration to the reservoirs and results of thermodynamic processes. The recovery efficiency in terms of percentages is also discussed here. This paper identifies the characteristics of recovering heavy oil in a convenient and energy efficient way.

Key Words: EOR, SAGD and Cyclic Steam Stimulation (CSS)