

عنوان مقاله:

Steam-Assisted Gravity Drainage Process (SAGD), Opportunities and Challenges in Heavy Oil and Tar Sands Recovery

محل انتشار:

اولین کنگره مهندسی نفت ایران (سال: 1385)

تعداد صفحات اصل مقاله: 14

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خلاصه مقاله:

Oil sands must be mined or recovered in-situ. Deposits close to the surface are mined while resources which are very deep require in-situ recovery. Steam Assisted Gravity Drainage process (SAGD) that is an in-situ recovery method that has been tested extensively in the heavy oil and bitumen reservoirs (especially in Canada) and has been generally successful (particularly in the very viscous tar deposits). Before the coinage of the SAGD process, mainly due to the efforts of Roger Butler, father of SAGD, several processes for the in-situ recovery of tar sand and bitumen including cyclic steam stimulation, in situ combustion, electric heating, and other horizontal well processes were tested. Among these SAGD is the only process that shows acceptable results. Steam Assisted Gravity Drainage process uses one or more horizontal production well located near to the bottom of the reservoir with steam injection above from separate injection wells. This configuration will end in good production rates with good recovery and reasonably low SOR (steam-oil ratio). Use of steam assisted gravity drainage has been demonstrated to be a promising way of producing heavy oil and tar sands which are not recoverable in normal operation in fields. Its commercial application has been established in Canada especially, and some of them are going to be well established in other parts of the world such as Venezuela and Saudi Arabia. In the case of Iranian naturally fractured reservoirs, whatever has influenced the heavy oil production in other parts of the world (Venezuela, Canada, Saudi Arabia and Kuwait) can certainly help us for future productions and developments which can be achieved efficiently by use of horizontal and multilateral drilling techniques. From technological point of view, whether SAGD in its present forms is exactly applicable for Iranian reservoirs is a different story. For instance, in-situ combustion or steam injection (vertical injector or horizontal injector as in SAGD) are not suitable methods for Iranian naturally fractured reservoirs, because combustion front can easily enter to the fracture and burn all producible oil in fractures. However, we should propose some modification of these methods (like SAGD) and initiate the process in a way that the vapor chamber in SAGD process or, combustion front, in the case of combustion processes, develops in matrix blocks instead of fractures, that deems to be appropriate for our naturally fractured reservoirs. This is merely a prospect for future ... works. This paper presents different aspects of SAGD operation toget

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