

عنوان مقاله:

Corrosion Prediction and Material Selection in an Iranian Sour Oil Well

محل انتشار:

شانزدهمین کنگره ملی مهندسی شیمی ایران (سال: 1397)

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خلاصه مقاله:

Optimized downhole material selection is important to the success of field development, both in terms of long term reliability and integrity, and return on capital employed. The industry currently does not fully understand the associated corrosion mechanisms and mitigations under sweet and sour combined environments. To-date, there is no standardized diagram or tabulation that should be used to select materials under these conditions. Even if the selection made by one operator may be slightly different from another, the process is generally similar. The production oil well under this study has a complex downhole conditions due to the extremely sour gases (high H₂S), which include high concentration of acid gases (high CO₂). These two conditions and the associated corrosion problems, make the material selection criteria for the well completions in this field an extremely vital task. The design philosophy is primarily to mitigate the risk of failure due to corrosion. This is accomplished by determining the highest alloyed material that maintains integrity and contains produced fluids throughout the well lifecycle with long-lasting resistance to corrosion. Partial pressure calculation of CO₂ and H₂S at saturation pressure was used as the primary criteria for selection of appropriate materials under high reservoir temperature. The Aspen HYSIS software was used for this purpose. It was concluded that using two types of the austenitic CRA (corrosion-resistant alloys) materials will satisfactorily pass the harsh corrosive environment at the bottom-hole section under HPHT conditions. The results were also compared to some offset wells in the world and reasonable agreement was observed.

کلمات کلیدی:

Material selection, well completion, carbon dioxide, hydrogen sulphide, corrosion resistance alloy

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