

Gravel Sizing Criteria for Hydrate Exploitation Wells and Its Application

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Abstract

In order to deal with sand production problems during the process of producing natural gas from hydrate-bearing sediments (HBS) with reservoir-fluid extraction method, a new gravel sizing method named “Hold coarse while eliminate fine particle (HC&EF method)” was developed for clayey hydrate-bearing formations. A hydrate-bearing site in Northern South China Sea was taken as an example to describe detailed gravel sizing procedures. Based on the analysis of basic particle size distribution (PSD) characteristics of HBS at SITE Y, the formation sand was divided into two components, which are coarse component and fine component. Secondly, gravel size for retention of coarse component and elimination of fine component were calculated, respectively. Finally, Intersection of those two gravel sizes was taken as the proper gravel size for marine hydrate exploitation well. The research results show that original formation at SITE Y is clayey sand with poor sorting and uniformity coefficient properties, and proper gravel size for upper segment was recommended as 143~215 μm , while that for lower segment was 240~360 μm . In considering the difficulty of layered sand control operation on offshore platform, proper gravel packing size for SITE Y was recommended as 215~360 μm .