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Bit selection and optimization while drilling development wells in a challenging oil fieldVahid Farahani¹, Mardani Rad¹ and Mansoor Zoveidavianpoor²¹Pedex, Iran²University of Technology, Malaysia

Operators drilling budget is mainly drawn by drilling fluid & bit as consumable material. Minimizing these two factors will reduce well cost sharply. As an engaging element, bit plays a big role in ROP (rate of penetration) and drilling performance. Many of bit record remain confidential and has internal use for the operators and also during developing a field access to offset well data may not be easy. To provide a benchmark for future drilling project in South-Azadegan (SA) field, Iran and to give an idea for drilling engineers for future development wells in this field, the bit design & maturation process for bit selection is presented in this paper. History of running the bit for each hole section for similar well profile is discussed, feedback of each bit run is analyzed and data is provided for bit manufacture regarding to formation lithology, abrasiveness, sticky-soft or very hard formation. Then newer designed bit was ran and continuous optimization practiced to achieve a universal bit for each hole section. At 26" top hole section tricone milled tooth bit was utilized, while combination of tricone and PDC bits was used for 17½' section. Challenging high pressure formation in 12¼ section was drilled with a different type of PDC bit and best record is documented. 8 ½ "section which is composed of a vertical & directional also tried with different bit type & a good bit design was achieved. Drain section of the reservoir in horizontal 6 1/8" section was drilled while facing hydraulic and hole cleaning limitation. Latest optimized 6 1/8" bit for this section is achieved. To date of publishing this paper, presented are the best selected bits for each hole size, which optimized while drilling 20 wells in a scattered pattern on SA field through 2.5 years of operations.

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