An international operator working in Oman was faced with an aggressive drilling program to complete multiple slimhole lateral sections which required exact well placement precision. The goal was to shorten drill time and to maximize oil production through a soft carbonate section consisting of cretaceous lime mudstone. The primary challenge in this 6⅛-in. section was real-time geo-steering in the reservoir with a motor bottom-hole assembly (BHA). This proved problematic because Polycrystalline Diamond Compact (PDC) bits experience significant reactive torque, hampering steering control. Roller Cone bits are more steerable but the bit life is often lower due to bearing and seal wear. The operator turned to Baker Hughes, a GE company (BHGE), for help in overcoming these challenges.

Delivering superior drilling performance

BHGE worked with the operator in a collaborative partnership and conducted a thorough optimization review to identify the limiters to performance. The teams focused on optimizing the drilling program with best practices covering hydraulics and drilling parameters.

The **Kymera™ Mach 4 hybrid drill bit**, combing both PDC and roller cone cutting structures, was selected to meet the steerability and longevity requirements. The bit design was further enhanced with a custom gauge configuration for improved performance. This new gauge configuration is now part of a joint patent application filed by BHGE and the operator.

With the new 6⅛-in. hybrid drill bit integrated into an improved drilling program, the operator was able complete two laterals, replacing two PDC bits and saving one trip. The Kymera Mach 4 bit delivered excellent toolface control and smooth geosteering. An added benefit was a 114% increase in the rate of penetration (ROP), from 70 to 150 ft/hr (21.3 to 45.7 m/hr), compared to offset wells drilled using roller cone bits.

Based on this success, the operator has implemented an aggressive drilling and development program that delivers enhanced efficiency and superior well placement precision.

**15k** feet drilled with one Kymera bit

**114%** Improvement in ROP

**~$19k** saved per well