A producer in northeast India wanted to improve production in a deviated, underperforming well. Baker Hughes, a GE company (BHGE), used several integrated technologies to identify and resolve challenges that included mitigating well stability, inadequate weight transfer to bit, tight spots, bit balling, and a very low rate of penetration (ROP) resulting from lengthy completion times and high bit consumption.

At the time BHGE was engaged, it was taking the operator 50 to 59 days to drill 8 ½-in. to 6-in. sections. The unstable wellbore was causing issues such as extra logging trips, difficulty recording logs, and problems lowering the casing and liner.

The well had been facing declining oil recovery due to water coning as a result of ineffective oil/water zone isolation. The formations themselves were very heterogeneous with a high local dip uncertainty.

BHGE used real-time planning between its GPE and completions teams to design a prompt, effective solution for the operator. The BHGE logging while drilling (LWD) team deployed a combination of BHGE drilling services to improve borehole quality: AutoTrak™ RSS rotary steerable system, OnTrak™ resistivity, Gamma Ray imaging service, AziTrak™ deep bed boundary imaging service, and LithoTrak™ bulk density and porosity imaging service.

The AutoTrak RSS enabled weight-on-bit transfer and avoided torque and drag complications. Using a BHGE Talon high-efficiency PDC drill bit considerably reduced the drill bit consumption that had been lowering ROP and driving up costs. Additional ROP improvement was provided by BHGE Performax™ drilling fluids for effective bit lubrication, clay inhibition, and coal seam stability, which saved unnecessary wiper trips.

BHGE Drilling and Completions fluids along with the BHGE Liner Hanger and completion services were used to mitigate the well stability and to overcome the issues of bit balling and low ROP.

BHGE Reservoir Navigation services used the AziTrak tool to map conductive boundaries and avoid accidental reservoir exits. BHGE could then perform accurate geo-steering in the well in order to identify the areas of maximum producibility.
The integrated BHGE wireline solution using a combination of BHGE services enabled the operator to restore well production and obtain significant savings. Drilling time per section dropped from 59 days down to 25 days, which was less than half. This saved 40% of rig time and the associated costs, which were estimated at $1 million USD.

RNS modelled vs. actual drilled, along with D2B (distance to boundary) Cube indicating approaching conductive bed from the top

Well plot: actual vs. planned well trajectory

Optimization of packers/completion strategy using petrophysical analysis