



NESR Successfully Completes Multiple Perforation Operations on Two Geothermal Wells in the Far East

INTRODUCTION

Perforation service is extensively utilized in the oil and gas industry. It's application in geothermal well completions is quite rare since most of geothermal wells produce in open hole section.

The geothermal field in the Far East was targeted to produce a total of 30 MW using wellhead turbine power plant. The initial completion test results indicated that the produced flow rate of two geothermal wells in open hole section was less than the desired target. Upon investigating, it was found that the highest temperature profile was in an upper zone behind the casing. In order to optimize of the flow rate, such zone had to be perforated. NESR's wireline team successfully carried out the client's first geothermal casing perforation operation.

CHALLENGES

- This was the 1st job of its kind on a geothermal well.
- High temperature (BHST=250 deg C), above the safe operating temperature for even HT-explosive charge (HMX).
- Large casing sizes (13 3/8", and 9 5/8") require largest gun (7" carrier) and limit the length of the gun due to wireline cable strength limitation.
- Wellsite remote location (50 KM from crew accommodation).

OPERATIONS SUMMARY

- Produced water was continuously injected at high rate (~30 bpm) to cool down the well.
- Temperature logs were run every morning prior RIH perforation guns.
- 7" guns were loaded onsite using 10 ft gun, with 12 spf, 39 gr HMX SDP razor shape charge, with A-161 (HNS) bottom firing mechanism were used in each run.
- 3 perforation runs per day were achieved, despite the complexity of logistics on this remote site location. The excess explosives had to be returned to the bunker every day.

ACHIEVED RESULTS

1. Perforation operation was completed within planned time without any miss-fire. Total of 200 m interval (100 m in each well, 67 runs).
2. Completion test indicated wells were flowing from the perforated interval.
3. Production tests showed that the flow rate from the two wells doubled and the original production target achieved.

