PROPOSED USE OF WELLHEAD ELECTRICAL POWER IN DRILLING GEOTHERMAL WELLS

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31st October – 4th November 2016, Addis Ababa, Ethiopia
INTRODUCTION

- The concept of wellhead generators;
  - Early generation of electricity.

- Current installed capacity at Olkaria - 81.1 Mwe

- Installed capacity in Eburru;
  - Eburru 2.5 Mwe
CURRENT SITUATION

KenGen new rigs are electric and use diesel fuel as means of generating electrical power needed for the various systems.

Average fuel consumption

4000 Litres

24-Hr Operation
CURRENT SITUATION…cont’

Percentage diesel consumption by rig equipment

- Diesel Generators: 70%
- Compressors: 30%
- Top Drive
- Rotary
- Draw works
- Circulation
- Lighting
CURRENT SITUATION…cont’

Fuel consumed in drilling wells OW-11A and OW-724A

<table>
<thead>
<tr>
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<th>KGN-01 at well OW-11A</th>
<th>KGN-02 at well OW-724A</th>
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<tbody>
<tr>
<td>Total fuel consumed in 2 months duration, (ltr)</td>
<td>323,000</td>
<td>237,000</td>
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<tr>
<td>Fuel cost per litre, (USD)</td>
<td>0.95</td>
<td>0.95</td>
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<td>Total fuel cost per well, (USD)</td>
<td>306,850</td>
<td>225,150</td>
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<tr>
<td>Total fuel cost per month, (USD)</td>
<td>153,425</td>
<td>112,575</td>
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<td>TOTAL (USD)</td>
<td>266,000.00</td>
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CURRENT SITUATION….cont’

❖ Average cost of diesel fuel consumed by the two electric rigs per year is therefore;

✔ USD 2,660,000.00

❖ 70% of this cost can be saved by using wellhead electrical power in drilling geothermal wells.
SOLUTION

WHAT?

➢ Save 70% of total cost of fuel consumed by rigs every year.....

HOW?

➢ Connect the rig to the nearest Wellhead generator.....
Fig. 1. Single Line Diagram for Wellhead to rig power connection.
CURRENT SITUATION….cont’

Fig. 2. Wellhead Plant OW-37 with rig KGN02 drilling on the same well pad.
COST BENEFIT

- By connecting rigs to a nearby wellhead generator,
  - Use of diesel generators will be substituted,
  - Savings of 70% of total fuel cost,

Annual savings from the two rigs:

USD 1,862,000.00
The annual savings of **USD 1,862,000.00**

**The Cost Benefit is USD 702,700.00**
OVERALL BENEFITS

✓ Improved profits for the Company
✓ Reduced carbon emissions
✓ Reduced noise levels
✓ Reduced fuel spillages at rig sites
✓ Reduced risk of thefts of diesel fuel
✓ Reduced risk of fire hazards
✓ Carbon credits
CONCLUSION

- The savings from the fuel costs can be directed to other projects.

- KenGen will benefit from Carbon credits due to reduced emissions from generators.
RECOMENDATIONS

- Built a grid network of 33kV lines into Olkaria field for internal loads

- Extend the metering points of the existing KPLC 33kV network and tap power from it.
THANK YOU