FEASIBILITY REPORT

PRE-DRILL EIA STUDY
NELP-VII BLOCK MB-OSN-2005/3

Project Details:

The NELP VII Block MB-OSN-2005/3 is located in the southwest of the Mumbai High-DCS platform of Mumbai Offshore Basin, having an area of 1685 sq. km. Well SM-1-2 is near western boundary of the block. It is approximately 44 Km north of SM-86 structure and about 80 Km north-west of D-1 hydrocarbon bearing structure. Deep water nomination block BB-OS-DW-1 lies in the west of the block. (Fig-1: Block Map). The block is located in the shallow water area. The water depth within 3D seismic area, where prospects are likely to be drilled, ranges from 90 m to 100 m.

Fig. 1: Map showing position of NELP Block
MB-OSN-2005/3
The farm out agreement between ONGC and ESSAR for JV partnership was signed on 24th December 2014 with ONGC as operator. The participating interest of ONGC is 70% and for ESSAR 30%. Vide letter No. DGH/PSC/ (MB-OSN-2005/3)/Phase-II/Assignments/2015 dated 28th April 2015, MOPNG has approved the proposed assignment of 70% to ONGC and transfer of ownership. PSC is being signed very shortly.

Co-ordinates of the Block MB-OSN-2005/3:

<table>
<thead>
<tr>
<th>Pt.</th>
<th>Longitude</th>
<th>Latitude</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deg.</td>
<td>Min.</td>
</tr>
<tr>
<td>A</td>
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<td>5</td>
</tr>
<tr>
<td>B</td>
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</tr>
<tr>
<td>C</td>
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<tr>
<td>D</td>
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<td>E</td>
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<td>35</td>
</tr>
<tr>
<td>F</td>
<td>70</td>
<td>21</td>
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</table>

Fig.2: Retained area for phase II Block MB-OSN-2005/3
Exploration Periods and Work Program:

At present the block is running in phase II (4th February 2014 to 3rd February 2016) with commitment of drilling one exploratory well with TD of 2500 m.

Need of the project:

The project is a part of exploratory endeavor of ONGC, on behalf of GOI, to find Hydrocarbon. Importance of the project for the country rests in ensuring energy security for the nation.

Geological Setup:

The Block MB-OSN-2005/3 falls in the Shelf Margin block of Mumbai Offshore Basin. Shelf Margin is demarcated to the east by Paleogene shelf edge, to the west by West Margin basement arch, to the north by Saurashtra Arch and to the south by Vengurla Arch. Major structural elements within the block from north to south are Saurashtra low to the north, followed by Alibagh saddle to the south of it (DCS platform and south Bombay low fall just to the east of it), Murud low, Mahabaleshwar high and Rajapur...
low to the south. The shelf is characterized by NNW-SSE trending parallel sets of longitudinal faults giving rise to series of horst-graben features. Basement associated anticlinal highs of Paleocene-Eocene sequence and tilted fault blocks of oligo-miocene section formed due to gravity slide are the two main structural styles in the block.

The generalized litho-stratigraphy of the shelf margin block is established based on the information of the wells SM-1-1 and SM-1-2, following the framework of lithostratigraphic classification of Mumbai offshore basin. In general the area received dominantly finer clastic of claystone and shale except for medium to thick carbonate deposits of Eocene and upper Miocene times which are laterally less extensive.

<table>
<thead>
<tr>
<th>Formations</th>
<th>Age</th>
<th>Log Motif</th>
<th>Lithology</th>
<th>Environment</th>
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<tbody>
<tr>
<td>Chinchini</td>
<td>Late Miocene to Recent</td>
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<td>Dominantly Claystone &amp; Shale with thin bands of Siltstone and Limestone</td>
<td>Outer Shelf to Upper Bathyal</td>
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<tr>
<td>Tapti</td>
<td>Miocene</td>
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<td>Dominantly Claystone &amp; Shale</td>
<td>Outer Shelf to Upper Bathyal</td>
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<tr>
<td>Mahim</td>
<td>Lower</td>
<td></td>
<td>Dominantly Claystone &amp; Shale With thin Siltstone layers</td>
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<tr>
<td>Alibagh</td>
<td>Upper</td>
<td></td>
<td>Claystone and Shale</td>
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<td>Heera/Mukta</td>
<td>Oligocene Lower</td>
<td></td>
<td>Dominantly Claystone &amp; Shale With thin Limestone layers</td>
<td>Outer Shelf to Upper Bathyal</td>
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<tr>
<td>Bassein</td>
<td>Eocene Middle</td>
<td></td>
<td>Limestone with shale streaks</td>
<td>Shallow Marine</td>
</tr>
<tr>
<td>Devagarh</td>
<td>Early</td>
<td></td>
<td>Limestone with shale streaks</td>
<td>Shallow Marine</td>
</tr>
<tr>
<td>Panna (Trapwash)</td>
<td>Paleocene</td>
<td></td>
<td>Trapwash Shale and Siltstone</td>
<td>Shallow Marine</td>
</tr>
<tr>
<td>Traps</td>
<td>Cretaceous Upper</td>
<td></td>
<td>Deccan Trap</td>
<td></td>
</tr>
</tbody>
</table>

**Fig.4: Generalized stratigraphy of the Shelf margin area**

**TENTATIVE LOCATIONS OF WELLS IN THE BLOCK**
The location for the wells will be decided based on the interpretation studies of 3D seismic data which is being interpreted. However, the initial 2D seismic interpretation indicates 6 probable locations for drilling wells as shown in the Map at Fig. 5 and 6. Initially, only one well is to be drilled, out of identified 6 prospects. The exact position of the well would be decided on the basis of 3D interpretation of seismic data being acquired in the block.

![Map of Prospects](image)

**Fig.5: Tentative Prospects shown in 3D area**

However, the tentative details of the well location is as follows:

- **Horizontal/Vertical**: vertical
- **Deep/Shallow**: Shallow
- **Bathymetry**: 90-100m
- **Target Depth**: 2500m
Mud to be used: Water based/SOBM
Objective: Mio/Plio Sequences
Co-ordinates of location: X: 638204.8 (tentative)  Y: 2092770.06

Estimated Well cost:
Rs. 70 Crores

Water depth and TD of well:
Water depth of the 3D area (within the block) where prospects are identified and to be drilled, falls within the range of 90m to 100m.
The total depth of the well to be drilled will be 2500m.

Fig. 6: Block Map with tentative prospects.
Logistics Details:

Name of nearest ports: Mumbai is the nearest port, approximately 137.68 Nautical Miles i.e. 255 Km., to the east of the block.

Technological Aspects:

Drilling: The drilling of the well with TD 2500m is likely to be taken up based on the analysis of data by integrating 3D seismic data as well as existing 2D data and geological data obtained from earlier drilled wells within and around the block area.

Logging: The complete set of logs will be recorded for obtaining information of drilled section. VSP is likely to be planned intermediate as well as at TD in the well.

Cementing: Cementing of Isolation as well as intermediate casing will have to be carried out.

Casing: The lowering of production casing and testing will depend on interesting hydrocarbon intervals present in the well which will be assessed after drilling the well.

Transportation of men and Material:

The personnel will be transported mostly by Helicopter service and also by sea route if necessary.

Material will also be transported mainly by sea route and also by Helicopter.

Duration of operations:

The details will be available after the well detailed planning. However, tentatively it may be 4-5 months period for the well.