Introduction to IEOT

OISD Noida

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ONGC - India's energy anchor
ISO 9001:2008 Certified & Benchmarking Institute
CORE AREAS OF IEOT

- STRUCTURAL ENGINEERING
- GEOTECHNICAL ENGINEERING
- MATERIALS & CORROSION
- RISK & RELIABILITY ENGINEERING
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- RISK & RELIABILITY ENGINEERING
Feasibility for relocation of platforms

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OUTLINE

Platform Identification
Abandonment
Decommissioning
Relocation Study
Conclusions
## Salient Features of Platforms

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Platform</th>
<th>P-1</th>
<th>P-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type</td>
<td>Well platform</td>
<td>Well platform</td>
</tr>
<tr>
<td>2</td>
<td>Category</td>
<td>L-2</td>
<td>L-2</td>
</tr>
<tr>
<td>3</td>
<td>Year of Installation</td>
<td>2009</td>
<td>2008</td>
</tr>
<tr>
<td>4</td>
<td>water depth (m)</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>No. of conductors</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>No. of piles (Originally)</td>
<td>4 Main Piles</td>
<td>4 Main Piles</td>
</tr>
<tr>
<td>7</td>
<td>Dia of Main piles</td>
<td>60”</td>
<td>60”</td>
</tr>
<tr>
<td>8</td>
<td>Boat landing</td>
<td>1 (4 stage)-along Row-2</td>
<td>1 (4 stage)-along Row-2</td>
</tr>
<tr>
<td>9</td>
<td>No. of risers</td>
<td>3 (1<em>8” + 2</em>12”)</td>
<td>3 (1<em>22” + 2</em>12”)</td>
</tr>
<tr>
<td>10</td>
<td>Riser Protector</td>
<td>2 (one each on Row-A &amp; Row-B)</td>
<td>2 (one each on Row-A &amp; Row-B)</td>
</tr>
</tbody>
</table>

### Water Depth

<table>
<thead>
<tr>
<th>S. No</th>
<th>Re-location</th>
<th>Water Depth (m)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>M-1</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>M-2</td>
<td>35</td>
</tr>
</tbody>
</table>
Decommissioning Process

- Planning
- Inspections & Permissions
- Well Plugging & Abandonment
- Pipeline abandonment
- Decommissioning of equipment
- Conductor removal
- Topside removal
- Jacket removal
- Site clearances
Platform Removal

- Removal of Equipment
- Cutting of Deck & Removal
- Cutting of Piles
- Jacket removal

At Original Location
Water depth: 20 m

Deck cut around EL (+) 8.5m

Jacket cut below Mud line
Re-location philosophy

- Installation of plinth framing at the new location where water depth is more

- Installation of insert piles and skirt piles, if required, where water depth at relocation is same as existing water depth for the platform.
Platform Re-location Process

At Original Location

- Deck cut around EL(+) 8.5m
- Jacket cut below Mud line

At Re-location

- Fabrication of Plinth framing
- Installation of plinth framing
- Installation of Jacket
- Installation of Deck structure
Relocation Process

Platform Identification
1. Fabrication of adequate plinth platform and securing to sea bed
2. Jacket mating to Plinth platform using pile grippers and grouting
3. Installation of transition pieces
4. Deck stabbing to the jacket at new location

Decommissioning process
1. Engg. Surveys
2. Securing permits/approvals
3. Plugging & Abandonment of wells
4. Decommissioning of topsides
5. Removing the platform in line with IMO guidelines

Re-location
1. In-place analysis study
2. Pre-service analysis
3. Fatigue analysis

Note: Elevation of associated appurtenances and deck shall be adjusted to the new location as per the requirement.
Platforms considered to be relocated to New area have been analysed with environmental data of New location.

Soil data of new location has been considered in the analysis.
Relocation Analysis

- A Global static In-place analysis has been carried out for the proposed re-location sites.
- 100 year return period environmental conditions have been considered in the analysis.
- Deterministic fatigue analysis
Relocation of platform P1 to M1 site

Original WD at P1: 20m
New Location WD at M1: 20 m

Foundation Design:

1. Four Insert Piles (of 48” dia. upt to 86.3m vertical penetration).

2. Four Clamp-on Skirt Piles (of 60” dia. upt to 60.0m vertical penetration.)
Relocation of platform P2 to M2 site

Original WD at P2: 25m
New Location WD at M2: 35 m

Foundation Design:

• Plinth Platform: 10 m
• secured to seabed using 4 piles
  (four of 66” dia. up to 86 m vertical penetration and two of 72” dia. up to 86 m vertical penetration)
CONCLUSION & RECOMMENDATIONS

- Existing platforms can be reused at the proposed new location with refurbishment and strengthening of existing structure, as & if required.

- Construction & installation of new plinth structure required for adjusting increased water depth.

- The relocation of platforms is suitable for proposed new locations provided number of conductor requirement at new location is equal or less.
Q&A

THANKS