PA-B Barge Loading Preparations

12-14 January 2007
Piltun B Topside Friday afternoon 12th January 2007, 3 days before barge loading commences.

Topside weight 28,0000 tonne

Load Support Frame 6,200 tonne

Lower deck section erected November 2004
166 meters

The topside will move more than the length of one and a half football pitches
Transportation barge awaiting the PA-B topside.

Barge is 190 meters long, 45 meters wide at short end and 92 meters wide at “T” end. Empty barge weight is 19,000 tonne. The topside and load support frame weigh 34,200 tonne.
Workers cutting and pulling steel cables for installation to the hydraulic jacks.

During loading, the hydraulic jacks will pull the cables are pulled from the barge through the jacks, see the arrows.

When all the cables have been installed over 63 kilometres of cable will have been be used.
10 Hydraulic jacks will pull the topside onto the transportation barge. Each jack has the pulling power of 520 tonne.
Hydraulic control panel for the hydraulic power unit, one for each jack, ten total.
Hydraulic jacks operator will monitor jacks and make adjustments as necessary using this computer programme.

<table>
<thead>
<tr>
<th>Type</th>
<th>jack1</th>
<th>jack2</th>
<th>jack3</th>
<th>jack4</th>
<th>jack5</th>
<th>jack6</th>
<th>jack7</th>
<th>jack8</th>
<th>jack9</th>
<th>jack10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke [mm]</td>
<td>159</td>
<td>160</td>
<td>150</td>
<td>162</td>
<td>150</td>
<td>158</td>
<td>170</td>
<td>154</td>
<td>150</td>
<td>152</td>
</tr>
<tr>
<td>Load [kN]</td>
<td>1144</td>
<td>677</td>
<td>835</td>
<td>983</td>
<td>348</td>
<td>667</td>
<td>708</td>
<td>1043</td>
<td>888</td>
<td>963</td>
</tr>
<tr>
<td>Lift [mm]</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total lift [mm]</td>
<td>153</td>
<td>318</td>
<td>812</td>
<td>164</td>
<td>317</td>
<td>811</td>
<td>158</td>
<td>322</td>
<td>162</td>
<td>321</td>
</tr>
</tbody>
</table>

**Total Load [kN]:** 8139
There are 37 individual cables to each hydraulic jack. The cable ends are held at the barge end in a flange. Ten jacks X 37 cables per jack = 370 cables.
Hydraulic jacks are actuated one at a time. As each cable set is tensioned, loose cables are identified then tightened so all cables have equal tension.
General purpose grease will be spread on the skid rail.

1000 liters of grease is staged along the length of each skid rail.
Two 500 tonne pushing jacks are available to help get the
topside moving. They weren’t needed for the Lunskoye-A
barge loading.
This is the Barge ballasting control office. The operator keeps the barge level as the topside skids along the barge. Loading will start at low tide.
The water level in each ballasting tank can be adjusted by the operator. On the left monitor the green squares show water being ballasted out and the red squares show water being ballasted in. Water will be pumped out of ballast tanks as the topside is slid onto the barge to keep it level. On the right monitor, the numbers in the top graphic actual water level. The tide is monitored by the tide gage. Tidal effect is on average, 1.2 meters.
Deballast discharge pipes
Barge level and straightness of the topside will be monitored as topside slides along and barge is ballasted to add buoyancy compensation for weight.
This straightness gage is mounted at the bottom centre of the load support frame. A technician using a transit will monitor this gage from the far end of the barge.
Other preparations include removal of elevators, stair towers, utility hoses and cables.
After the topside is in position on the barge, the sea fastening bracing will be installed.
03:00 Monday – Safety walk about

04:00 Monday - Start Loading

03:00 Tuesday – Topside Loaded
Brought to you by the Piltun Topside Fabrication Site

Geoje Island, South Korea