Single Hybrid Riser Under Cyclonic Loads

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Author’s Intro

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Team leader for risers, umbilicals and flexibles in McDermott Epsom UK office.
He has 13 years experience in SURF including in-place and installation

Erich dos Santos – Senior Riser Engineer
Senior Riser Engineer in McDermott Epsom UK office.
He has 8 years experience in risers and moorings analysis.
SHR Concept
SHR Geographical Locations

Areas in which tropical storms form
Cyclones

Current Profile Comparison

- Water Depth (m)
- Current Velocity (m/s)

100-yr
10,000-yr Cyclonic
Cyclones and SHR

10,000-yr loading

100-yr loading
## Cyclones and SHR

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>100yr Loads</th>
<th>10,000yr Cyclonic Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Bottom Flexible Connector Angle</td>
<td>deg</td>
<td>11.6</td>
<td>14.9</td>
</tr>
<tr>
<td>BT Lateral Displacement</td>
<td>m</td>
<td>143.2</td>
<td>301.6</td>
</tr>
<tr>
<td>Top BT Depth</td>
<td>m</td>
<td>-214</td>
<td>-235.6</td>
</tr>
</tbody>
</table>
SHR Solutions: Top Tension

Increase of up thrust force
SHR Solutions: Deeper BT

Lower buoyancy tank
Conclusions

• SHR is capable to be installed in harsh cyclonic regions
• Suitable for deepwater applications
• Advantage in export lines application
• Increasing the top tension impacts installation and construction (cost)
• Lowering B.T. may impact flexible jumper specification
• SHR has great advantage compared with other riser solutions for vessel limited pay-load capacity

Your questions?
References

• Slide 3: https://oilandgastechnologies.wordpress.com/2015/08/13/free-standing-hybrid-risers-fshr/

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• Slide 8:


• Slide 7: http://www.learnnc.org/lp/editions/nchist-recent/6248