SITUATION AND CRITICAL ISSUE

Fatigue damage on Suezmax tanker design

To extend the operating life of a vessel with a history of fatigue cracks, DNV GL performed an assessment to establish the level of local reinforcement needed.

DNV GL SOLUTION

- A prismatic fine meshed FE model of the entire vessel was adopted to rapidly generate the historical and predicted future loading conditions.
- 240 detailed local models were used in the hotspot fatigue assessment.
- In this way each structural detail could be assessed with its individual load spectrum and structural design.

VALUE DELIVERED

- A reliable basis was established for the decision to apply pro-active repair measures.
- The effects of different future operational profiles were considered.
- The number and extent of the structural reinforcement could be reduced by pro-active repair measures.
- A repair proposal was given covering both reliability as well as fabrication efforts.

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Life Extension of Jack-Up

A Jack-up in operation was reaching its original design life. To continue operation in the region, the shelf state regulators required the owner to support their case.

DNV GL provided technical justification to demonstrate sufficient capacity.

DNV GL SOLUTION

- Initial design life of jack-up 20 years
- 20 years operation about to be exceeded and documentation of remaining fatigue life requested by PSA
- Sophisticated dynamic FE analysis with site specific environment from past operations to be carried out
- Remaining fatigue life to be documented

VALUE DELIVERED

- Remaining fatigue life for critical details documented according to relevant standards and procedures
- Risk Based Inspection (RBI) analysis carried out and new plan for inspection made
- Jack-up to be allowed continuous operation on field
- Implementation of results also in Class inspection regime

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