Navigational Risk Assessment

- Determination of navigational risk
  - for vessels in restricted waters, coastal waters and
  - for installations like platforms, wind farms, cables and pipelines
- Modelling of the vessel traffic based on e.g. AIS data
- Determination of accident probabilities and consequences
- For multiple installations or neighbour installation can be considered within a cumulative analysis
- Risk reducing measures are derived for enhanced safety
- Risk assessment leads to fulfilment of customer and authority requirements

Vessel Traffic Analysis with AIS
Cumulative Collision Risk Analysis for Offshore Wind Farms
Navigational Risk for Specific Sea Areas
Benefit Case – Navigational Risk Assessment

SITUATION AND CRITICAL ISSUE

New north sea offshore wind farm

The North Sea shows high vessel traffic (see AIS plot of the German bight on the right)

DNV GL was asked to determine collision risk for vessels due to new planned wind farms in regard to acceptance criteria of approval authorities.

DNV GL SOLUTION

- Vessel traffic analysis based on AIS data
- Estimation of the probability for powered vessels sailing on investigated shipping routes to hit a wind mill
- Estimation of the probability for drifting vessels to hit a wind mill by using the method of the Monte Carlo Simulation
- Consideration of environmental conditions (wind and tidal stream) and of risk control options
- Determination of collision probabilities and consequences (probabilistic amounts of oil spill/year)

VALUE DELIVERED

- Determine the collision frequency due to a new wind farm (criteria is more than 100 years between two collisions.)
- Assess risk respecting acceptance criteria defined by authority for the aspects of safety, environmental and ship / wind turbine

For more information please contact: Daniel.Povel@dnvgl.com
Is the risk for vessel traffic due to cable installation acceptable? Cable installation takes time and influences the vessel traffic. Buried cables imply risks for anchoring and fishery. DNV GL was asked to assess risk for the ease and safety of vessel traffic due to cable installation and operation for approval processes.

DNV GL SOLUTION
- Site assessment and identification of areas of special interest
- Identification of hazards and risk reducing measures
- Quantification of hazard scenarios (collisions between ships and cable lay vessels, emergency anchoring on buried cables) and risk reducing measures
- Recommendations & reporting

VALUE DELIVERED
- The impact on ease and safety of shipping is acceptable
  - for installation
  - and operation
- Identification of risk reducing measures
- Assessment and recommendations for cable routing, burial depths, guard ships, cable lay methods, splicing positions, time slots etc.

For more information please contact: Daniel.Povel@dnvgl.com
SITUATION AND CRITICAL ISSUE

New infrastructure installations in vicinity of frequently used waterway

Ensuring a safe passage of shipping traffic of the infrastructure installation should be verified

DNV GL conducted a Risk Assessment for the navigational water way

DNV GL SOLUTION

A four step solution was applied:

1. Traffic analysis of the waterway,
2. Execution of a FMEA for all potential traffic situations taking into account all external influences and determine all relevant accident scenarios,
3. Determining the design accident scenario,
4. Verifying of the structure against loads of design accident scenario

VALUE DELIVERED

▪ The Risk Assessment resulted in a design load case for the dimensioning of the infrastructure
▪ The Risk Assessment resulted in a documentation required for the approval process on the part of the authorities

For more information please contact: Daniel.Povel@dnvgl.com
Navigational risk of the North East passage for gas carrier owner

The gas carrier was due sailing through the North East passage in August – September 2011 and customer needed to assess the additional navigational risks to take the necessary precautions ensuring safe navigation in arctic conditions.

SITUATION AND CRITICAL ISSUE

DNV GL SOLUTION

- The assessment of the navigational risks was based on the following procedure:
- Review of metocean information from the navigation route
- 1 day hazard identification (HAZID) workshop at customer’s premises
- Qualitative risk evaluation of the hazards identified including means to reduce and mitigate risk

VALUE DELIVERED

- The risk assessment made the customer in a better position to make sound decisions with respect to safe navigation in arctic conditions:
- Clearly defined lines of command between vessel and external parties involved in the operations
- Means of evacuation taking different ice conditions and LNG carrier ice-breaking capabilities into account
- Systems and procedures for getting people out of the water, taking due account of different ice conditions

For more information please contact: Morten.Mejleander-Larsenl@dnv.com
SITUATION AND CRITICAL ISSUE

Risk analysis of tanker transport for oil charterer

The risk associated with tanker transport contributes significantly to oil charterer’s overall risk in terms of loss of life, economic risk and environmental risk. Needed: A risk model that calculates the overall risk picture of the charterer’s oil tanker activity in order to document and benchmark the risk level.

DNV GL SOLUTION

- Develop a risk model that calculates and documents the risk picture based on statistics describing customers tanker activity, historical world fleet accident statistics, and expert judgment by DNV.
- Develop a user-friendly interface including ship route definition by use of Geographic Information System (GIS) and possibility to evaluate effects of risk reducing measures.

VALUE DELIVERED

- The Risk Picture Tankers model from DNV makes the oil charterer able to:
  - Manage and mitigate the risk associated with tanker transportation of oil.
  - Reduce the risk of loss of lives, oil spills and claims.
  - Evaluate their vetting and shipping policy.
  - Evaluate strategic opportunities such as increasing the level of certain activities or entering a geographic area.

For more information please contact: Peter.Nyegaard.Hoffmann@dnv.com