Safety Equivalence Analysis

- Analysis verifying the equivalence of alternative designs based on prescriptive / deterministic rules
- Analysis methods and process is geared to MSC/Circ. 1002 /1212 /1455 and has to be agreed with the administration, if applicable.
- Widens the design and solution space in terms of e.g. innovative
  - Constructions
  - Systems
  - Components
  - Materials
  - Operation
- Leading to more attractive and competitive designs
- Shipowner benefits from more attractive and competitive designs

Comparing apples with pears?

MA services and benefit cases
Benefit Case - Safety Equivalence Analysis

SITUATION AND CRITICAL ISSUE

Optimisation of piping

Piping string on vessel should be optimized with respect to safety

DNV GL (FutureShip) was asked to assess the design and find possibilities for safety related optimization

DNV GL SOLUTION

- Creation of a 3D FE model and identification of relevant load case combinations
- Definition of 18 input variables with their corresponding distribution functions for the optimization and definition of three output variables
- Sensitivity analysis using Latin hypercube sampling for identification of correlations between input and output values

VALUE DELIVERED

- The obtained safety factor strongly depends on the Y- acceleration of the ship and the yield stress of the piping material
- The wall thickness and outer diameter are of minor importance
- Customer followed DNV GL’s (FutureShip’s) recommendations and achieved cost savings

For more information please contact: Gundula.Stadie-Frohboes@dnvg.com
Benefit Case - Safety Equivalence Analysis

SITUATION AND CRITICAL ISSUE

Transportation of Chemicals on Offshore Supply Vessels

IMO resolution A673(16) prohibits carriage of several of the needed chemicals in bulk, however Norwegian Maritime Authority (NMA) has accepted deviations from IMO Res.A673, based on equivalent level of safety versus carriage of same cargoes on chemical tankers.

DNV GL SOLUTION

- DNV GL has conducted Hazard Identification (HAZID) to map and analyse areas with risk connected to the operation
- Operational and Structural measures to compensate for the risk have been defined in workshop with shipping company, designers, chemical experts and subject matter experts from DNV GL
- The purpose of the process is to find equivalent solutions to fulfil the intentions of the regulations within chemical transportations

VALUE DELIVERED

- The main value of the delivery is helping the industry to control the risk related to transportation of chemicals of the offshore industry
- With a large group of workshop participants from all involved parties of the operation, the risk identification and evaluation of the process have been comprehensive and productive
- The areas covered in the HAZID has been sufficient for the customers to get an approval from NMA

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MA services and benefit cases