Underwater Noise Analysis

- Calculation of the noise radiation from machinery components, such as main diesel engines, electric motors etc.
- State of the art CFD calculations of propeller induced pressure impulses at blade rate orders
- Tip-vortex propeller noise calculations by semi-empirical methods
- Environmental Impact Assessments

Benefit from:
- Reduced noise emission from vessels
- Increased catch rates
- Minimized environmental impact
- Strong link to the DNV GL SILENT class

Underwater noise emissions and their effects

MA services and benefit cases
Benefit Case – Environmental Risk Assessment

SITUATION AND CRITICAL ISSUE

Restricted drilling activity

Environmental concerns regarding a sandeel caused national authorities to delay drilling at an offshore production field. Possible estimated cost of the delay 1 million USD each day or a total of 25 million USD.

DNV GL SOLUTION

- Assisted the operator to estimate noise emission from drilling activity
- Model noise propagation in the bottom sediments and water out to the nearest fixed installation
- Compare noise levels to existing noise from platform supply vessels at neighboring site
- Determine area around drilling where startling response in the eel was expected
- Cooperate with the customer to present the results to the environmental agency.
- The decision to delay drilling was revoked

VALUE DELIVERED

- DNV-GL contributed to objectively determining the expected environmental impact and compared this to the existing noise emissions in the area
- The operator avoided possible losses of 25 million USD.

Contact: manno363@dnvgl.com
Benefit Case – Noise Reduction of Fishing Vessel

SITUATION AND CRITICAL ISSUE

Fishing vessel – Increased catch rates

Excessive propeller noise of a fishing vessel caused reduced catch rates of Saithe resulting in highly reduced profits.

DNV GL SOLUTION

- Assisted the owner in measurements of the emitted underwater noise to characterize the noise levels and sources involved.
- Comparing the emitted noise to the hearing threshold to different species of fish.
- Analyze and advise on propeller design to obtain a new low noise propeller.
- Compare the new low noise propeller to DNV-GLs class criteria, SILENT-F (Fishery) for low noise fishing vessels where experience shows increased catch rates.
- The vessel significantly increased the catch rates.

VALUE DELIVERED

- DNV-GL determined the reason for reduced catch rates and contributed to the design of a new low noise propeller.
- The vessel significantly increased the catch rates and profits.

Contact: manno363@dnvgl.com
Benefit Case – Design review of naval vessel

SITUATION AND CRITICAL ISSUE

Navy vessel – Optimal noise design

Advanced navy vessel required low noise signature to increase the tactical capabilities and operational range of the vessel.

DNV GL SOLUTION

- State of the art CFD analysis of propeller and advise on propeller design to obtain a low noise propeller
- Finite-element analysis of noise from main diesel generators and electric motors to model noise into the water
- Determine design criteria for sub-suppliers
- Advice and verification measurements during the building process

VALUE DELIVERED

- DNV-GL followed the vessel from design, during building, to completion to ensure extremely low noise emission
- This ensured optimal operational capabilities and low noise signature

Contact: manno363@dnvgl.com
Benefit Case – Design review of research vessel

SITUATION AND CRITICAL ISSUE

Research vessel – Optimal noise design

Advanced research vessel required low noise emission to optimally perform oceanographic research

DNV GL SOLUTION

- State of the art CFD analysis of propeller and advise on propeller design to obtain a low noise propeller
- Finite-element analysis of noise from main diesel generators and electric motors to model noise into the water
- Determine design criteria for sub-suppliers
- Advice and verification measurements during the building process
- Final verification measurements against the strict but achievable DNV-GL underwater noise class notation SILENT-R (Research)

VALUE DELIVERED

- DNV-GL followed the vessel from design, during building, to completion to help realize a very low but achievable noise signature
- The vessel increased operational capabilities, increased data quality and reduced environmental noise emission

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