Offshore supply operations

Is the total logistics system supporting your offshore activities well-tuned on risk, cost and environmental performance?

Purpose

All operations associated with offshore activities are normally either time critical or very costly – or both. In addition, all operations need to continuously improve in terms of reducing their environmental footprint. One logical extension of these facts is that exploration, construction and production offshore requires efficient, resilient supply and support functions that minimises the risk of service interruption while also optimising the environmental efficiency.

We assist you in analysing, optimising or designing your total supply operations and logistics infrastructure in terms of energy efficiency, environmental impact, risk and robustness

Benefits

When performing a total review of the transport and logistics network for a given operation, bottlenecks and redundancies will be revealed. An analysis of the energy efficiency of the transport system will identify potentials for improving the performance of the supply services.

A typical analysis will consider the use of supply bases, the number and performance characteristics of vessels to be employed, routing and scheduling (frequency) issues, to name a few. This will be translated and modelled into our analysis or optimisation software (depending on the type of problem), which will provide the basis for the actual recommendations:

Rating and benchmarking of alternative scenarios or solutions, actual cost of resources and cost/benefit of changing critical resources in the network, such as bases, vessels, schedules and restrictions.

Our approach

The ability of DNV to draw on world-class expertise within logistics and optimisation, ship and offshore vessel operations, energy efficient vessel design, Rules and Regulations, risk and vulnerability analyses and more will make this a truly unique service.

A transport network analysis may easily evolve into a problem of unsolvable complexity unless the scope is properly defined. In practice, this is done by selecting the correct breakdown level of the transport system in cooperation with the client; some problems will have to consider the whole transport chain or a fleet, but for others it will suffice to look at a vessel. This might also be regarded as a modular approach, where different analyses, success criteria, metrics and KPIs for assessing the solution are applied as defined by the problem characteristics.

The calculation and analysis model allows all potential improvements to be tested against the KPIs, and the selected scenarios documented and quantified in terms of performance.

The TRADS optimization framework, the MARLEN transport system modelling methodology and the PCT software for energy efficiency and vessel performance (all from DNV) are among the unique tools in our toolbox. In addition, we are licensed users of the TurboRouter™ software from MARINTEK,

Calculations and assessments involved in the problem analysis

First-order results from running the model are typically unit costs, cost per unit or tonne-km, environmental performance (emissions), utilization figures, total cost of the solutions evaluated. Where scenarios are defined, differential costs and performance figures are evaluated.

Second order variations, as may also be built into scenarios, could be for instance evaluating effects of adding or removing departures, changing the supply bases, use alternative means of transportation for one or more of the legs, and so on.

This was of crucial importance for the overall objective, namely to end up with a transport solution that is not inadvertently sub-optimized with respect to one single component if this will compromise the total cost picture.

The positive name for suboptimisation is of course specialisation, which is often also required, but it will in any case be important to know the risks and costs associated with decisions.

Case: Offshore production vessel supply system

An energy company operating an offshore oil production facility wished to investigate the cost and environmental efficiency associated with supporting the facility. In particular, the supply chain involving special equipment packages was to be investigated: Quite often these packages were delivered using costly special transport arrangements instead of and outside of the regular supply system, and this was the source of much trouble for the client.

DNV was approached and selected for the assignment, and a project team of our experts and the client representatives put together. It was decided that the study should include an analysis of the base-to-base logistics as well as the base-to-platform leg so as to cover the entire transport chain exposed to the client.

The study further addressed issues related to supply base availability, use of alternative means of transport for the critical equipment, vessel scheduling and routing, contractual barriers to efficiency, and finally routines for the turnaround of the vessels at the supply bases.

In order to address these issues in a manner that would also consider the cross-dependencies between parameters and interrelation of links in the supply network, a transport network model was prepared by DNV. By making this an integrated model, the performance of for instance a given ship employed on a given route could be compared not only to any other alternative vessel for the specific task, but the performance change of the entire transport solution as a consequence could be determined and assessed.

Selecting the best solution

The broad experience of the DNV team is also crucial in identifying the best of the available and feasible solutions from the data produced by the transport system analyses. Alternative solutions producing apparently higher returns must sometimes be discarded where restrictions exist or the knock-on effects on adjacent systems and operations are too significant to implement under the project scope.

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