

Summary:

Effects of proposed ship routeing off the Norwegian coast

Part 1 Røst-Utsira

The Norwegian Coastal Administration (NCA) commissioned The Institute of Transport Economics (TØI) to conduct a risk assessment of a proposed ship routeing measure off the Norwegian coast from Røst to Utsira.

The proposed measure is to route tankers and other heavy ship traffic (over 5.000 gross tonnes (GT)) with high environmental risk potential farther away from the coastline from Røst to Utsira. The proposed measure includes a traffic separation scheme separating traffic going in the different directions (north/south).

The idea behind the proposal is that when ships travel on the proposed route any emergencies or possible oil spills will occur farther away from the coast, giving the authorities more time to react and enable emergency towing or oil spill response that may significantly reduce the overall environmental impact. Another effect is that possible oil spills from ship accidents will to a greater extent evaporate before reaching the coast.

The study has compared accident probabilities and consequences for the present routes and for the proposed route using traffic data for 2008 and traffic forecasts for the year 2025. The effects of transferring ship traffic to the proposed route have also been illustrated by use of two case scenarios.

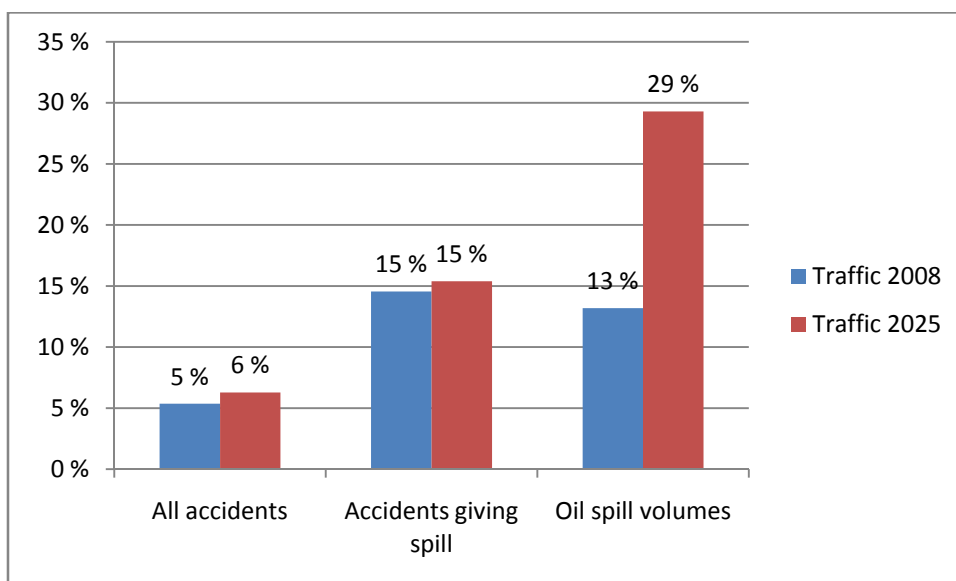
Reduced accident and oil spill probabilities

Today's traffic and a route model were charted by using data from the Automatic Identification System (AIS). A marine traffic simulation programme called MARCS, developed by DNV Technica, was used to simulate accidents and oil spill volumes both for today's route and for the proposed route, in both 2008 and 2025. Table S.1 and figure S.1 summarizes the results for all vessels.

Table S.1. Effects of proposed routeing on the expected number of all accidents, on oil spill accidents, and on the expected volume of oil spills, with traffic data for 2008 and 2025.

All vessels	All accidents [freq. per year]	Spill Accidents [freq. per year]	Oil spill + bunkers oil [tonnes per year]
Today's routes 2008	3.17	0.55	3224
Proposed route 2008	3.00	0.47	2799
Difference	0.17	0.08	425
Significance	Not sig.	Not sig.	Significant
Today's routes 2025	3.82	0.78	5059
Proposed route 2025	3.58	0.66	3577
Difference	0.24	0.12	1482
Significance	Not sig.	Not sig.	Significant

Source: TØI-report 1036/2009



Source: TØI-report 1036/2009

Figure S.1. Expected effects of proposed routeing. Per cent change in all accidents, oil spill accidents and the volume of oil spills with traffic data for 2008 and 2025.

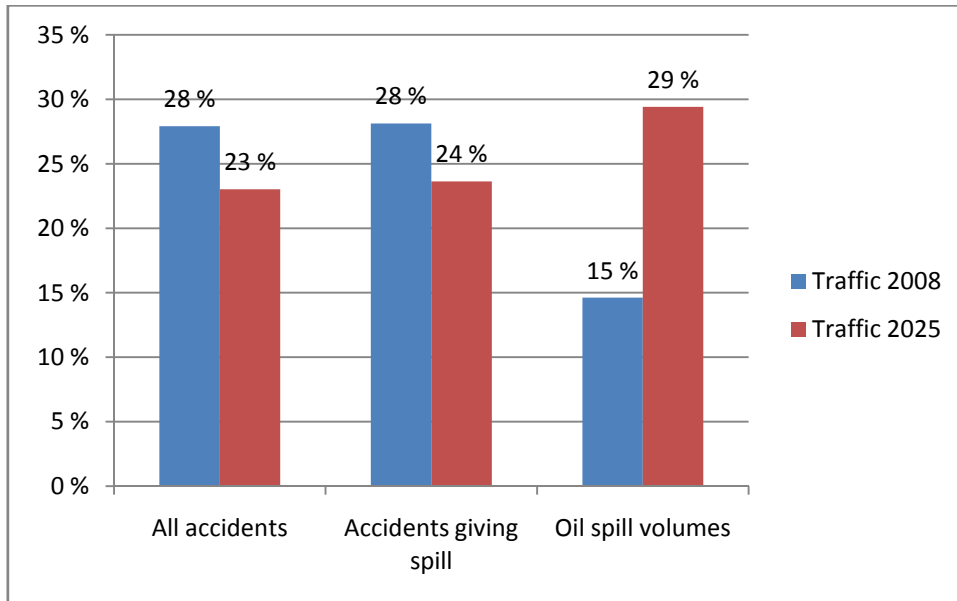
The proposed routeing of the ship traffic between Røst and Utsira reduces the expected number of accidents and the expected oil spill volumes, both with ship traffic volumes as in 2008 and 2025. The expected reduction in oil spill volumes is particularly great when traffic forecasts for 2025 are used in the simulations.

Tankers are the major contributor to potentially large oil spill volumes, and when tankers are analyzed separately the effects are even stronger. This is revealed in table S.2 and figure S.2.

Table S.2. Effects of proposed routeing on the expected number of all tanker accidents, on oil spill accidents for tankers, and on the expected volume of oil spills for tankers, with traffic data for 2008 and 2025.

Tankers only	All accidents [freq. per year]	Spill Accidents [freq. per year]	Oil spill + bunkers oil [tonnes per year]
Today's routes 2008	0.86	0.32	3120
Proposed route 2008	0.62	0.23	2670
Difference	0.24	0.09	456
Significance	Not sig.	Not sig.	Significant
Today's routes 2025	1.52	0.55	4930
Proposed route 2025	1.17	0.42	3479
Difference	0.35	0.13	1450
Significance	Not sig.	Not sig.	Significant

Source: TØI-report 1036/2009



Source: TØI-report 1036/2009

Figure S.2. Expected effects of proposed routing. Per cent change in tanker accidents, oil spill accidents for tankers, and the expected volume of oil spills for tankers, with traffic data for 2008 and 2025.

Transferring tanker traffic to the proposed new route gives nearly 30 per cent reductions in accidents and 15 per cent reduction in oil spill volumes when traffic figures for 2008 are used in the simulations. When traffic forecasts for 2025 are used accidents are reduced by over 20 per cent and oil spill volumes are reduced by almost 30 per cent.

Environmental effects illustrated by oil spill scenarios

To oil spill scenarios, at Stad and Sotra, have been constructed in order to analyze the effects of having oil spill accidents on the proposed route instead of on one of the routes used today. The scenarios clearly reveal that the probability of spill accidents decreases with the proposed measure. Also the probability of oil tanker collisions is smaller on the proposed new route than on today's routes, and given an oil spill accident the portion of the fuel or bunker oil reaching the shore is substantially reduced.

There are few adverse environmental effects of adopting the proposed routing measure. The most important factor is a potentially larger coastline impact area for oil spills. For crude oil, this negative effect is counterbalanced by increased evaporation and natural degradation of oil resulting from increased distance to the coast. Fuel oil spills from locations along the proposed traffic lane may hit a larger impact area. It is, however, possible that this risk will be mitigated by increased time for oil spill response by the authorities, given an accident.

Conclusion

In sum it seems clear that the proposed routing measures reduces both the probability of accidents and the consequences of possible accidents. Thus, adopting the proposed routing measures will give a significant risk reduction.

The expected reduction in total oil spill volumes is predominantly a result of an expected decline in tanker oil spills. The proposed measure is in particular addressed towards managing these environmental risks mitigating the effects of the expected tanker traffic increase along the Norwegian coast. It seems, accordingly, reasonable to conclude that the proposed new route is a quite appropriate counter measure.