



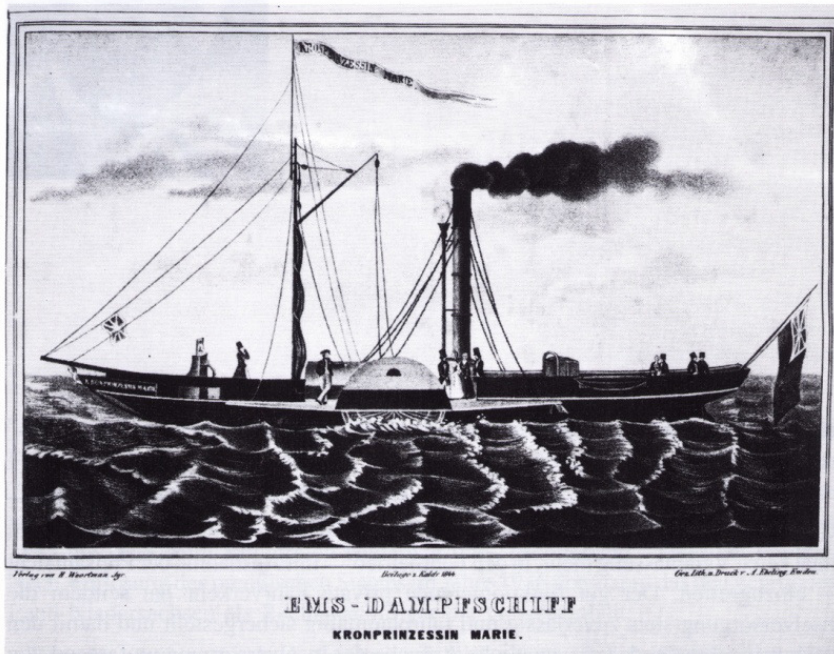
Conversion of MV „Ostfriesland“ Into a dual-fuel ferry – first review

Introduction

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- A detailed illustration of a ferry ship, likely the 'Ostfriesland' mentioned in the text. The ship is white with a red hull and a blue and red stripe along the side. It has multiple decks with various structures, including a bridge, funnels, and lifeboats. The ship is shown from a side-on perspective, moving towards the right. The background is a light blue sky with some clouds.
- The Aktien-Gesellschaft „EMS“
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The Aktien-Gesellschaft „EMS“



Mit der KRONPRINZESSIN MARIE (I), einem in England gebraucht gekauften hölzernen Schiff, nahm die Ems-Dampfschiffahrts-Gesellschaft Concordia im März 1844 ihre Fahrten im Emsmündungsrevier auf. 1846 wurde das Schiff in EMSSTROM umgetauft und blieb bis 1857 im Einsatz.

„Kronprinzessin Marie“ (engl.: Crown princess Mary),
the company's first ship

The company

- Founding year: 1889
(evolved from a company founded in 1843)
- Head office: Emden, Germany
- Directorate: Dr. Bernhard Brons
- Employees:
 - Ferry's: 136 plus 27 apprentices
 - Group: > 400
- Business volume: 25,4 Mio € (2010)
- First German passenger shipping company with
“International Safety Management Code” (ISM)



The Company Group AG „EMS“



REEDEREI CASSEN EILS
GmbH & Co KG



NORTHERN NHC
HELICOPTER



Ferry service to Borkum



MV „Ostfriesland“
(1.200 passengers)



MV „Münsterland“
(1.200 passengers)



MV „Helgoland“
(1.200 passengers)



MV „Nordlicht“
(272 passengers)



MV „Groningerland“
(623 passengers)



MV „Wappen von Borkum“
(358 passengers)

Ferry service to Borkum

Emden (D), Borkumkai , Außenhafen (engl.:outer harbour)



- Motorway A31 is close (about 3 km)
- Trainstation „Emden Außenhafen“ next to terminal
- Parking at the terminal (short and long time)
- Restaurant „Fährhaus“ at the terminal
- ferry or catamaran schedule is independent from tide



Ferry service to Borkum

Eemshaven (NL), Terminal Borkumlijn



- Connected to motorways A1 and A7
- Public bus transport to and from Groningen
- Restaurant at the terminal
- Guarded parking
- Crossing independent from tide.

Ferry service to Borkum



- Company-owned harbour with four berths for ferries and catamaran
- Harbour(managed by „Borkumer Wirtschaftsbetriebe“)
- Cargo quay of „Borkumer Industriegüterumschlag GmbH & Co KG“ (subsidiary of BKL) to supply the island of Borkum

Reasons for LNG

Main ferryschedule between Emden and the island Borkum.

- Travel - distance per year about: 31.000 nm
- Fuel consumption per year about: 1.150.000 liter

Retrospectively the fuelcosts have increased by > 100% in the last 10 years

World
Heritage
Wadden Sea



Reasons for LNG

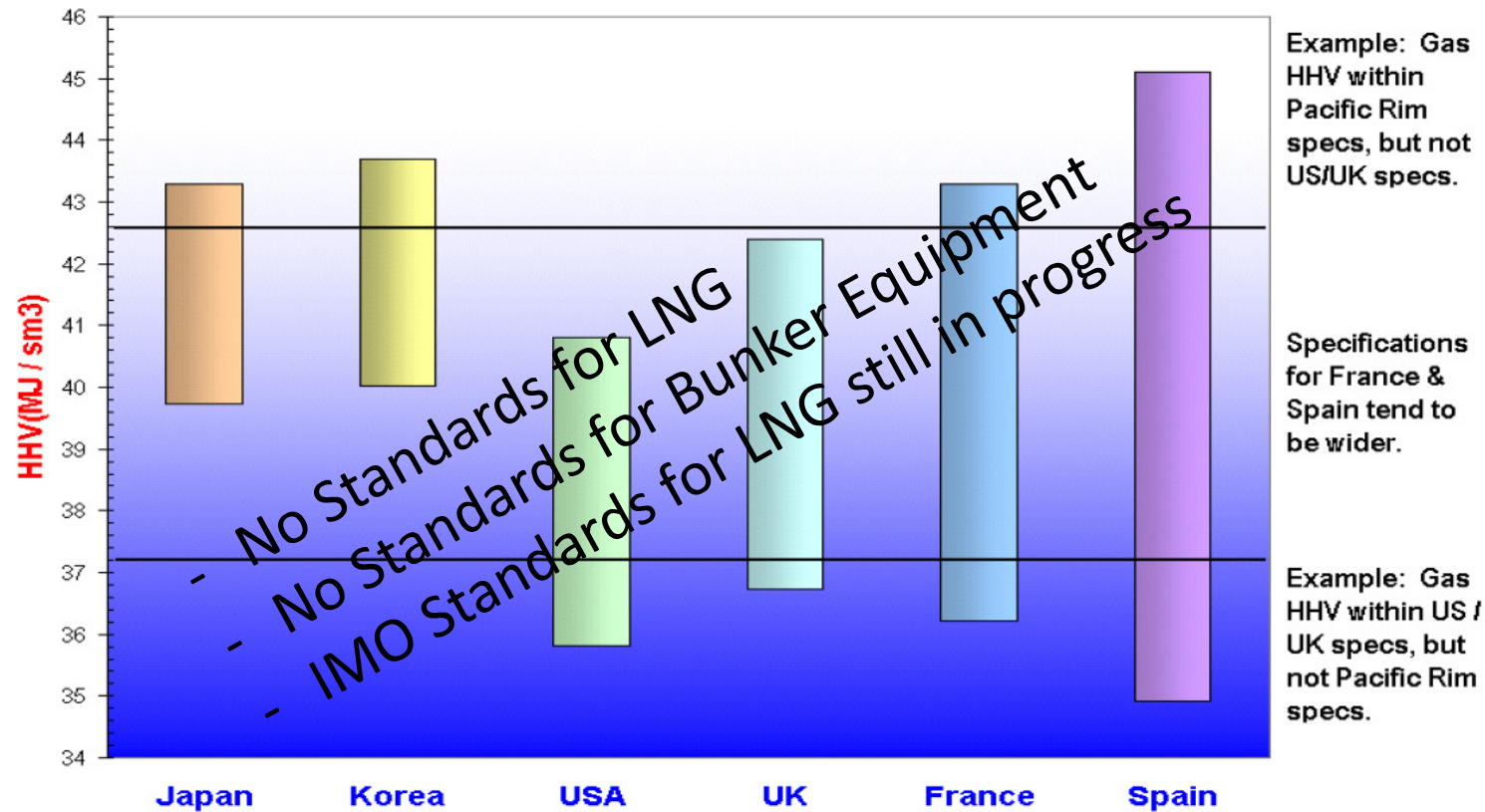




Introduction in LNG



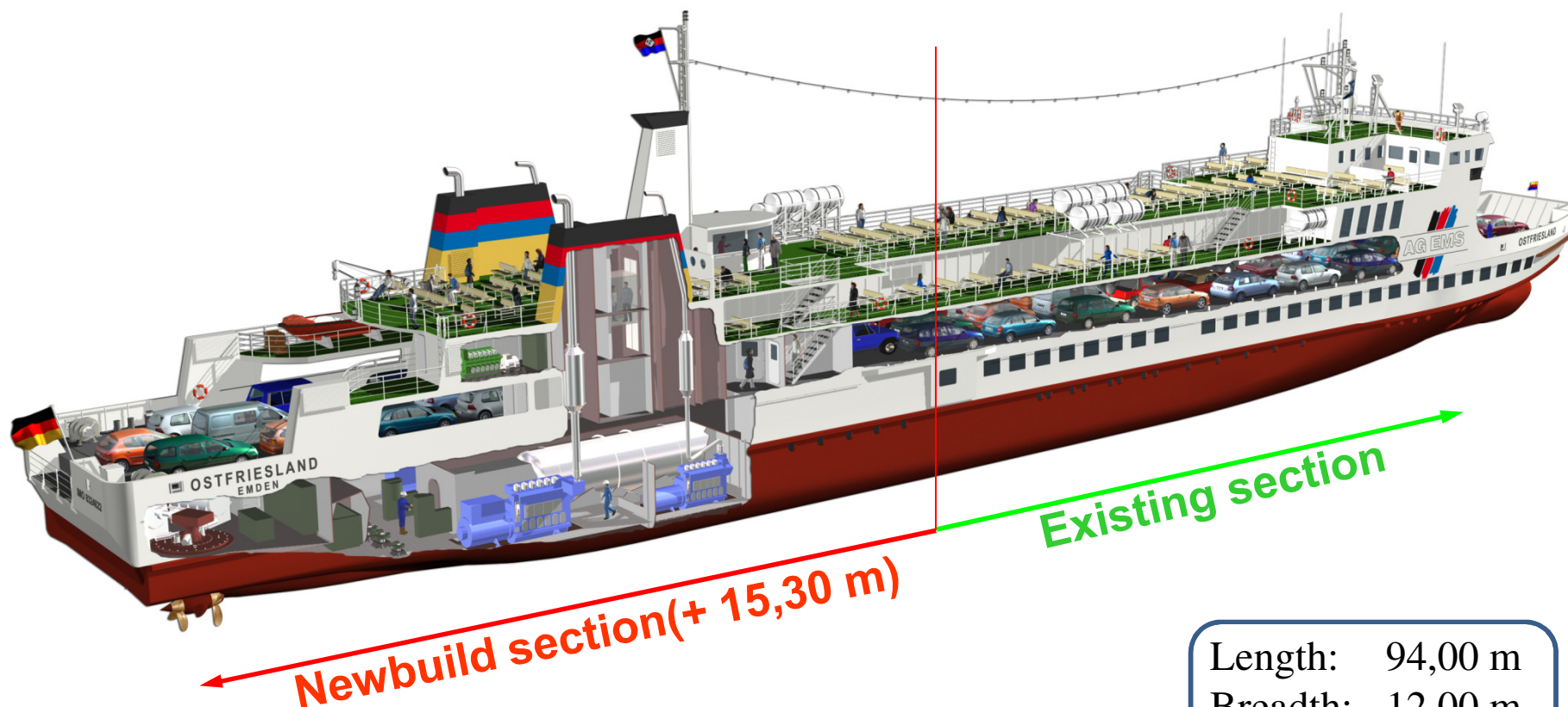
Introduction in LNG



Standards for gas oil: MGO (Marine gas oil), MDO (Marine diesel oil), HFO (Heavy fuel oil)



Refit - Project „Ostfriesland“



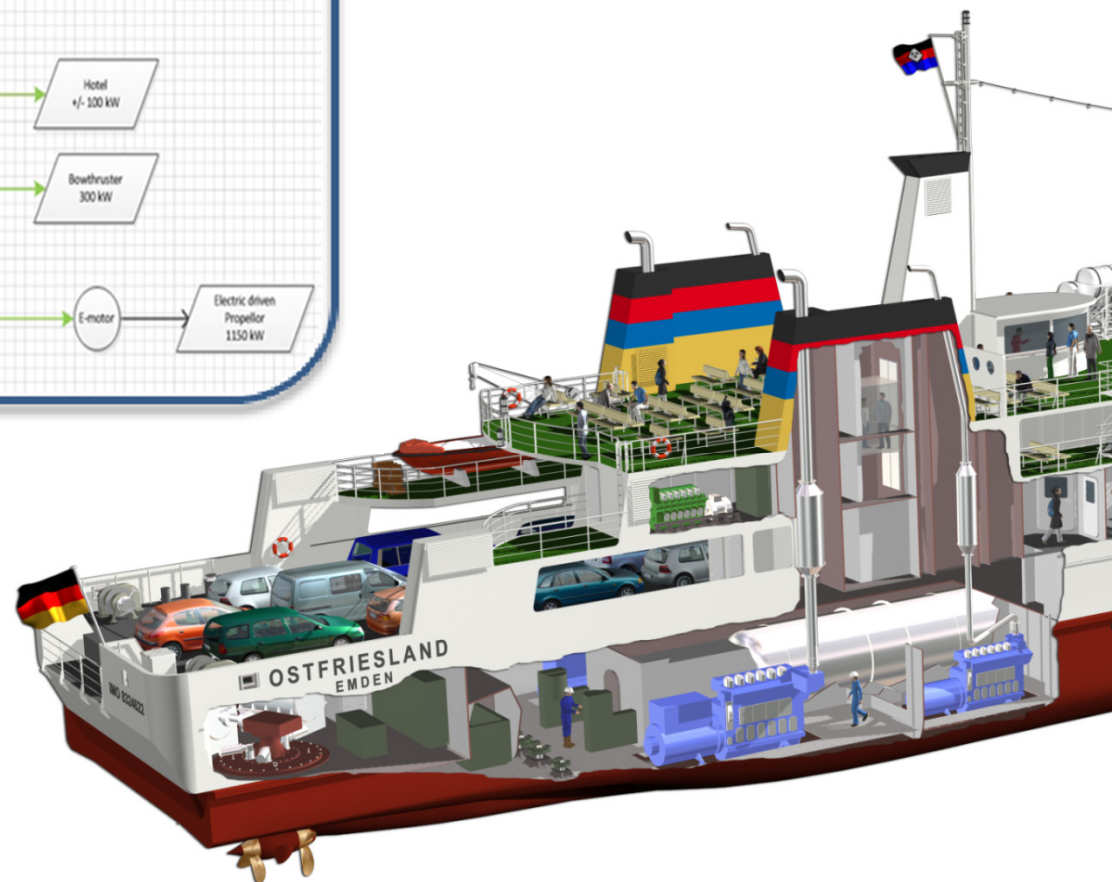
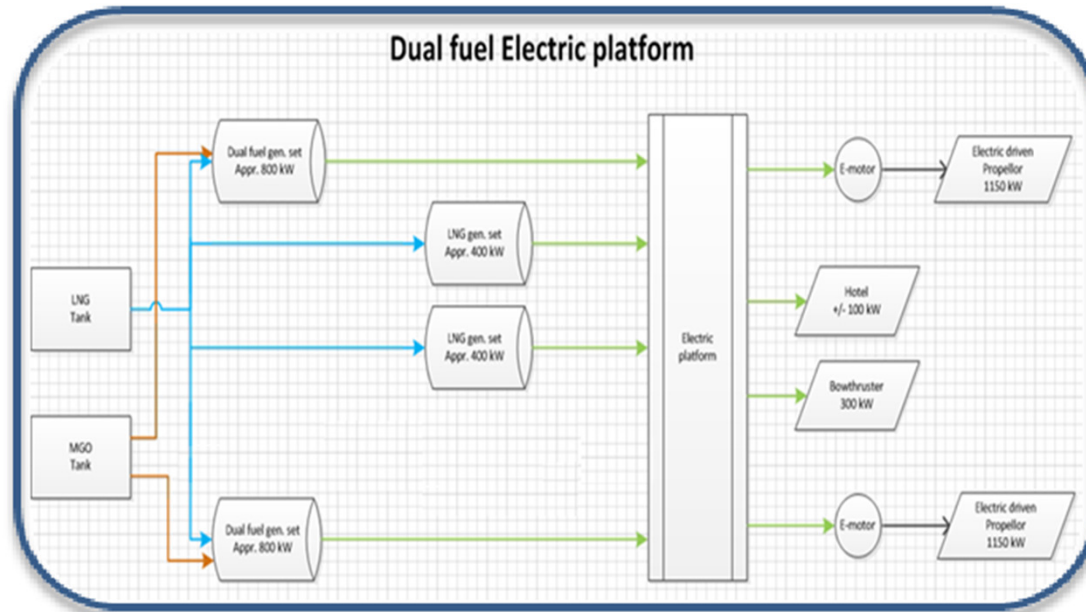
Length: 94,00 m
 Breadth: 12,00 m
 Draught: 2,35 m

Refit - Project „Ostfriesland“

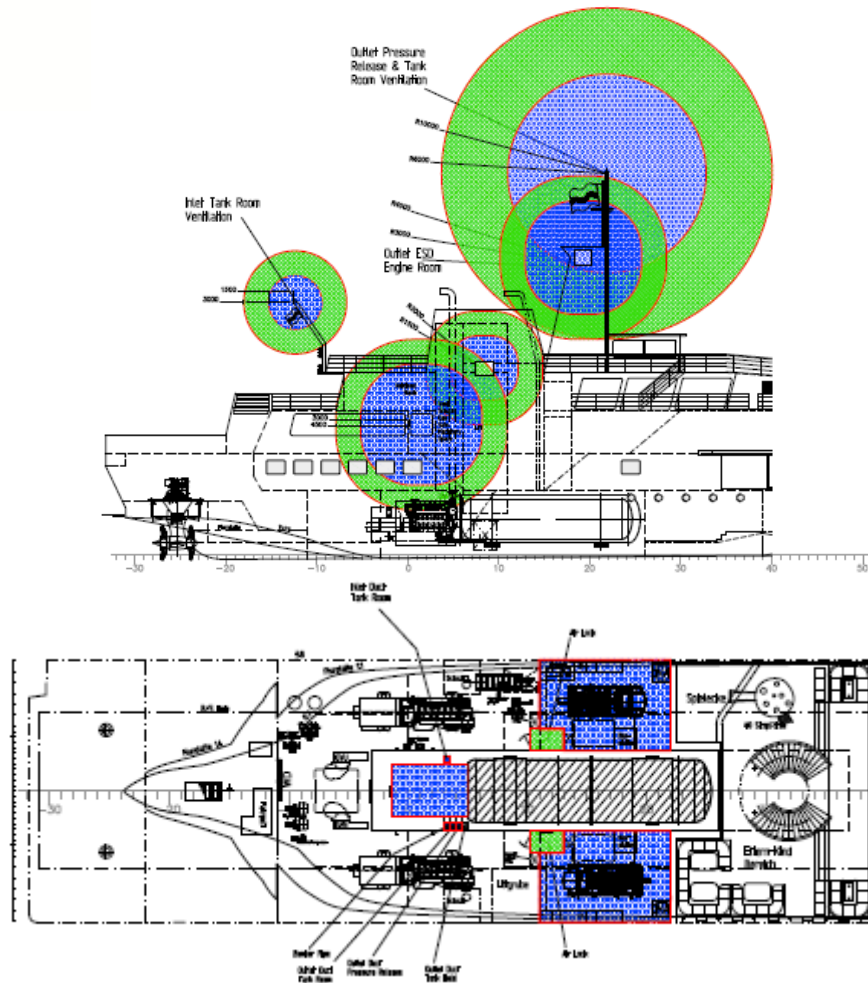
- Wärtsilä LNG Pac 45 with Coldrecovery and Glycolwatersystem
- Main Gensets
2 x Wärtsilä 6L20 DF (1056 Kw each)
- Aux Gensets
2 x Mitsubishi GS6R2-MPTK (394 Kw each)
- Propulsion
2 x Schottel Ruderpropeller „STP 1010“ (1150 Kw each)



Refit - Project „Ostfriesland“

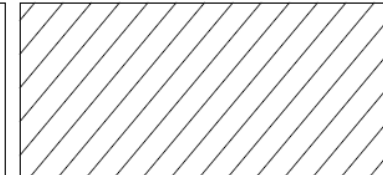


Refit - Project „Ostfriesland“



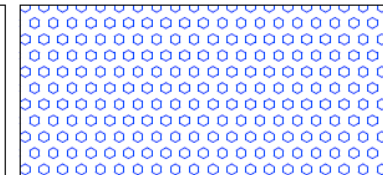
ZONE 0

AREAS IN WHICH AN EXPLOSIVE GAS ATMOSPHERE IS PRESENT CONTINUOUSLY OR PRESENT FOR LONG PERIODS



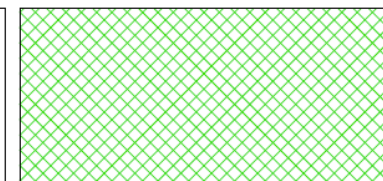
ZONE 1

AREAS IN WHICH AN EXPLOSIVE ATMOSPHERE IS LIKELY TO OCCUR IN NORMAL OPERATION



ZONE 2

AREAS IN WHICH AN EXPLOSIVE ATMOSPHERE IS NOT LIKELY TO OCCUR IN NORMAL OPERATION, AND IF IT DOES OCCUR, IS LIKELY TO DO SO INFREQUENTLY AND WILL EXIST FOR A SHORT PERIOD ONLY



FMEA

„Failure Mode and Effects Analysis“

Guidelines (VI-3-1) for the use of Gas as Fuel for Ships

„MariTim Project“

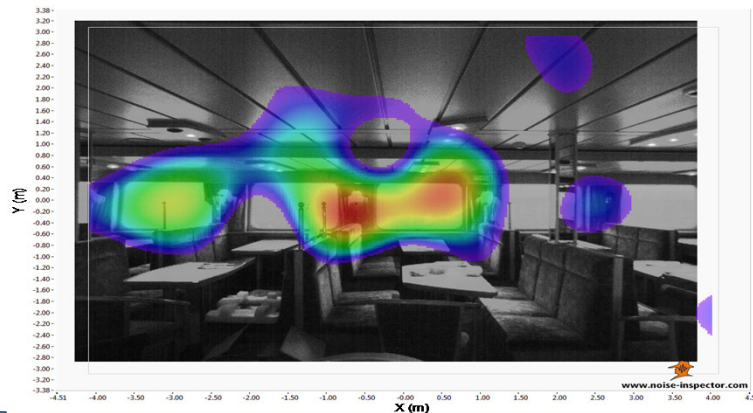
INTERREG IV A

Requirements for the LNG Passenger Vessel Project

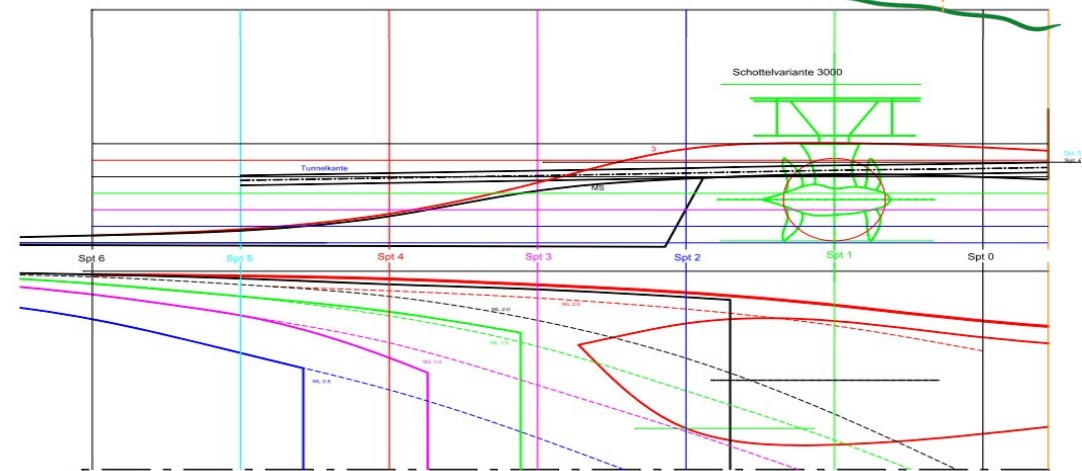
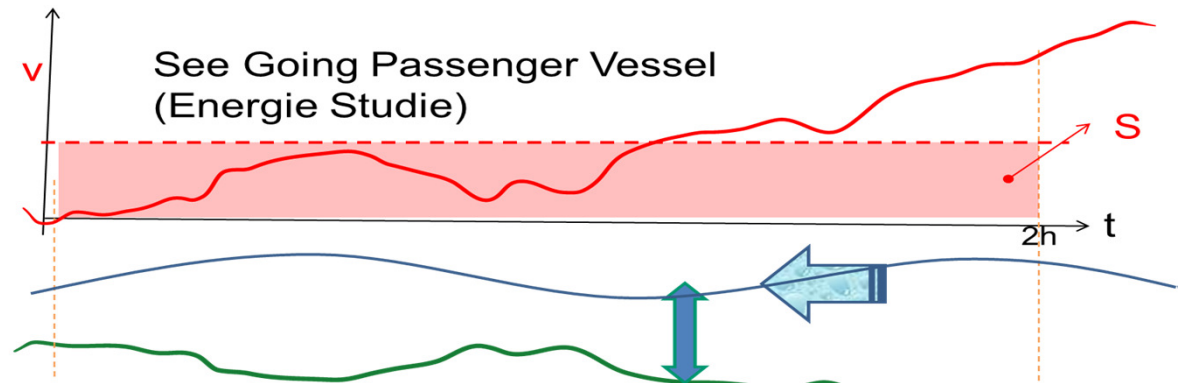
- Identifying the actual state
(consumption, emissions, vibrations, noise etc.)
- Identifying the target state
(ship-specific demands)
- Investigation of the class – and flagstate relevant issues
- Identifying the reduced / additional costs for the LNG Refit
and payback times „return of invest“
- LNG logistic

Ferry service to Borkum

„Fachhochschule Emden/Leer“ Prof. Dr. J. Göken & Team noise measurements



„DST Duisburg“ Prof. C. Thill calculated theoretical foundations from the River & Ship





Aktien Gesellschaft „EMS“

Zum Borkumanleger 6
26723 Emden-Außenhafen
Germany
Tel: +49 (0) 49 21/ 8 90 7 283
Fax: + 49 (0) 49 21/8 90 7 285
E-Mail: claus.hirsch@ag-ems.de
Internet: www.ag-ems.de