

**ANALISIS PENTINGNYA MENGOPERASIKAN ECDIS
DALAM PEMBUATAN *PASSAGE PLAN* KETIKA MELEWATI
ELBE RIVER DI KAPAL MV. NYK ORION**



SKRIPSI

**Diajukan guna memenuhi salah satu syarat untuk memperoleh gelar
Sarjana Terapan Pelayaran**

**Disusun Oleh : SETYANGGA NUR PRATAMA
NIT. 51145262 N**

PROGRAM STUDI NAUTIKA DIPLOMA IV

POLITEKNIK ILMU PELAYARAN

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HALAMAN PERSETUJUAN

ANALISIS PENTINGNYA MENGOPERASIKAN ECDIS DALAM
PEMBUATAN *PASSAGE PLAN* KETIKA MELEWATI ELBE RIVER DI
KAPAL MV. NYK ORION

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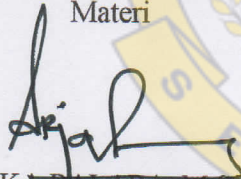
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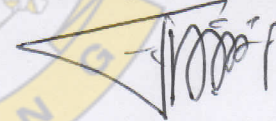
Dosen Pembimbing
Materi



Capt. ARIKA PALAPA, M.Si, M.Mar

Penata Tingkat I (III/d)
NIP. 19760709 199808 1 001

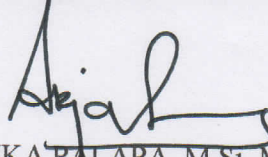
Dosen Pembimbing
Metodologi dan Penulisan



OKVITA WAHYUNI, S.ST, MM

Penata (III/c)
NIP. 19781024 200212 2 002

Mengetahui
Ketua Program Studi Nautika



Capt. ARIKA PALAPA, M.Si, M.Mar

Penata Tingkat I (III/d)
NIP. 19760709 199808 1 001

HALAMAN PENGESAHAN

ANALISIS PENTINGNYA MENGOPERASIKAN ECDIS DALAM
PEMBUATAN *PASSAGE PLAN* KETIKA MELEWATI ELBE RIVER DI
KAPAL MV. NYK ORION

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SETYANGGA NUR PRATAMA
NIT 51145262.N


Telah diuji dan disahkan oleh Dewan Penguji serta dinyatakan lulus

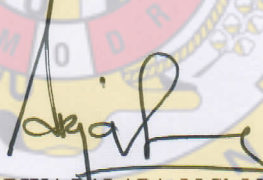
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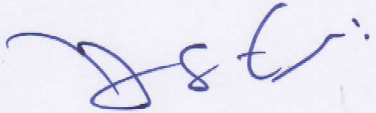
Penguji I

Penguji II

Penguji III


Capt. H. AGUS SUBARDI, M.Mar
Pembina Utama Muda (IV/c)
NIP. 19550723 198303 1 001


Capt. ARIKA PALAPA, M.Si, M.Mar
Penata Tk. I (III/d)
NIP. 19760709 199808 1 001


YUSTINA SAPAN, S.ST., M.M.
Penata (III/c)
NIP. 19771129 200502 2 001

DIKUKUHKAN OLEH:
DIREKTUR POLITEKNIK ILMU PELAYARAN SEMARANG

Dr. Capt. MASHUDI ROFIK, M.Sc, M.Mar
Pembina (IV/a)
NIP. 19670605 199808 1 001

HALAMAN PERNYATAAN

Yang bertanda tangan di bawah ini:

Nama : SETYANGGA NUR PRATAMA

NIT : 51145262.N

Prodi : NAUTIKA

Menyatakan bahwa skripsi yang saya buat dengan judul, “Analisis pentingnya mengoperasikan ECDIS dalam pembuatan *passage plan* ketika melewati Elbe River di kapal MV. NYK Orion” adalah benar-benar hasil karya saya bukan jiplakan skripsi dari orang lain dan saya bertanggung jawab kepada judul maupun isi dari skripsi ini. Bilamana terbukti merupakan jiplakan dari orang lain maka saya bersedia untuk membuat skripsi dengan judul baru dan atau menerima sanksi lain.

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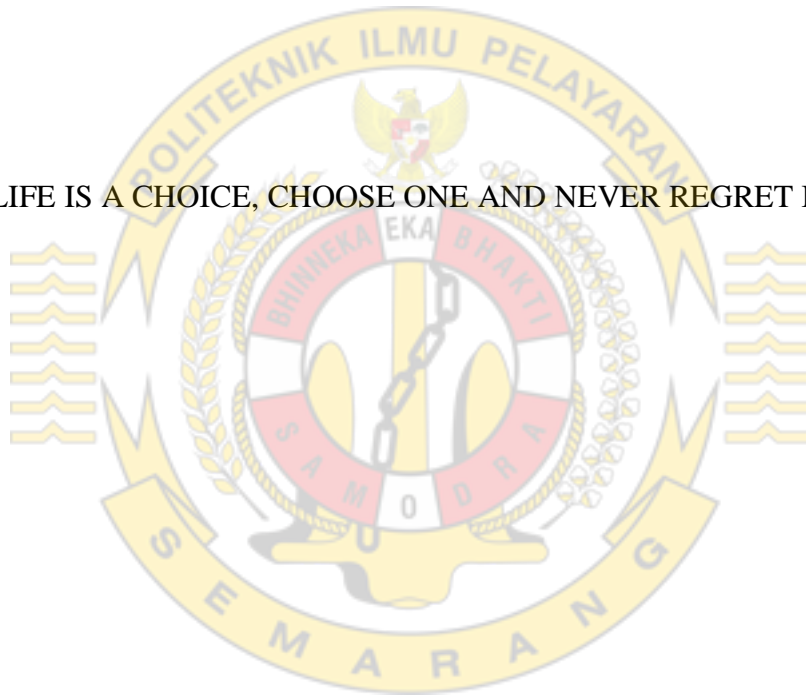
Yang menyatakan,



SETYANGGA NUR PRATAMA
NIT. 51145262.N

HALAMAN MOTTO

“LIFE IS A CHOICE, CHOOSE ONE AND NEVER REGRET IT”



PERSEMBAHAN



Segala puji syukur kepada Allah SWT yang telah memberikan rahmat dan hidayah-Nya sehingga penulis dapat menyelesaikan skripsi ini. Pada kesempatan ini penulis ingin mempersembahkan skripsi yang telah penulis susun ini kepada:

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4. Orang yang saya sayangi, yang selalu memberi semangat dan kasih sayangnya serta do'a sampai saat ini.
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Skripsi ini mengambil judul “Analisis pentingnya mengoperasikan ECDIS dalam pembuatan *passage plan* ketika melewati Elbe River di kapal MV. NYK Orion” yang terselesaikan berdasarkan data-data yang diperoleh dari hasil penelitian selama satu tahun lebih melaksanakan praktek di MV. NYK Orion milik NYK Ship-Management Pte. Ltd.

Dalam usaha menyelesaikan penulisan skripsi ini, dengan penuh rasa hormat penulis menyampaikan ucapan terima kasih yang sebesar-besarnya kepada pihak-pihak yang telah memberikan bimbingan, dorongan, bantuan serta petunjuk yang berarti. Untuk itu perkenankanlah pada kesempatan ini penulis menyampaikan ucapan terima kasih kepada :

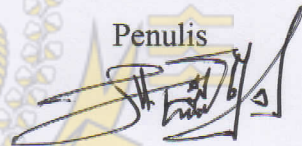
1. Yth. Dr. Capt. Mashudi Rofik, M.Sc, M.Mar , selaku Direktur Politeknik Ilmu Pelayaran Semarang,
2. Yth. Capt. Arika Palapa, M.Si., M.Mar. selaku Ketua Program Studi Nautika Politeknik Ilmu Pelayaran Semarang serta Dosen Pembimbing Materi Skripsi yang telah memberikan kemudahan dalam menuntut ilmu di Politeknik Ilmu Pelayaran Semarang dan memberikan dukungan, bimbingan, dan pengarahan dalam penyusunan skripsi ini.

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Semarang, 31 Januari 2019

Penulis



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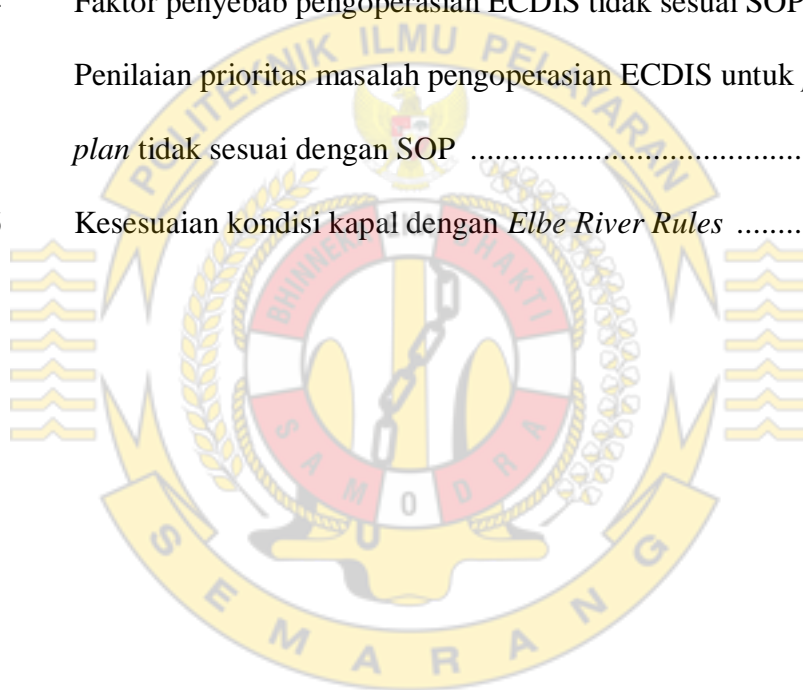
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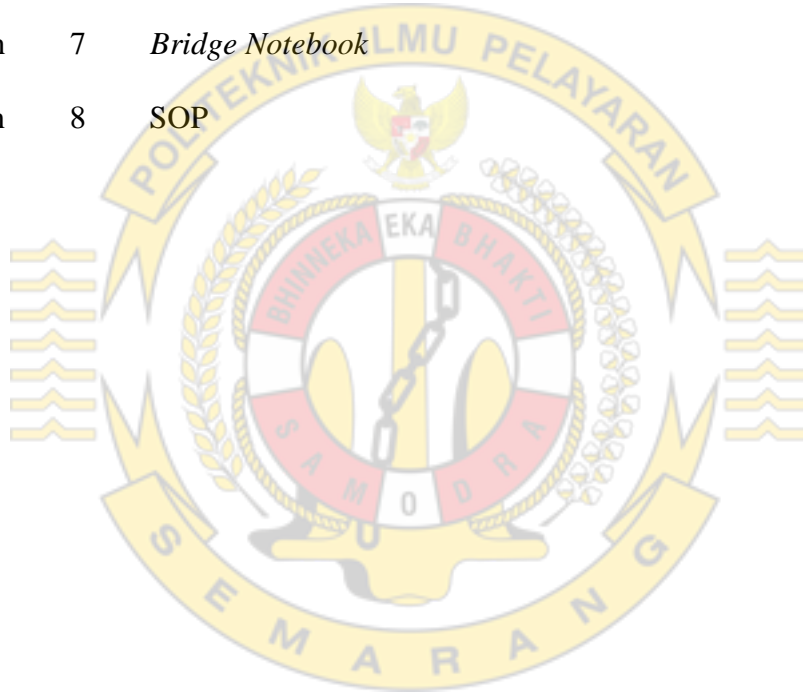


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ABSTRAKSI

SETYANGGA NUR PRATAMA, 2019. NIT : 51145262.N, “Analisis Pentingnya Mengoperasikan ECDIS Dalam Pembuatan *passage plan* Ketika Melewati Elbe River Di MV. NYK ORION”. Skripsi Program Studi Nautika, Program Diploma IV, Politeknik Ilmu Pelayaran Semarang, Pembimbing I: Capt. ARIKA PALAPA, M.Si., M.Mar. Dan Pembimbing II: OKVITA WAHYUNI, S.ST., M.M.

Electronic Chart Display And Information System (ECDIS) merupakan pengembangan modern dalam sistem navigasi di kapal yang sesuai dengan peraturan *International Maritime Organization* (IMO) dan dapat digunakan sebagai pengganti dari *paper chart*. Saat penulis praktek di kapal MV. NYK Orion Muallim yang ada kurang memahami cara pengoperasian ECDIS karena pada awalnya kapal MV. NYK Orion dilengkapi dengan 1 buah ECDIS untuk *training purpose* sehingga segala sesuatu yang berhubungan dengan *passage plan* menggunakan *paper chart* sebagai alat utamanya. Setelah kapal MV. NYK Orion melakukan *dry dock* di Zhoushan China, kapal MV. NYK Orion mendapatkan *supply* 2 buah ECDIS sehingga kapal MV. NYK Orion menggunakan sistem *full ECDIS* sebagai sarana navigasi.

Penulis melaksanakan pengamatan secara langsung terhadap pengoperasian ECDIS dalam pembuatan *passage plan* di Elbe River. Untuk menganalisa permasalahan ini, penulis menggunakan 2 metode teknik analisa data yaitu *Fishbone Analysis*, dan USG. Metode *Fishbone analysis* digunakan untuk menganalisis faktor-faktor penyebab pengoperasian ECDIS untuk *passage planning* tidak sesuai dengan SOP. Faktor-faktor yang didapatkan dari *fishbone analysis* kemudian dianalisis menggunakan metode USG untuk mendapatkan faktor yang paling dominan serta gambaran mengenai upaya yang harus dilakukan untuk menanggulangi permasalahan tersebut. Sehingga nantinya akan didapat solusi yang dapat dilakukan untuk menanggulangi permasalahan dalam pengoperasian ECDIS untuk *passage planning*.

Dengan melaksanakan upaya tersebut diharapkan dapat meningkatkan kemampuan Muallim kapal dalam mengoperasikan ECDIS dalam pembuatan *passage plan* sesuai dengan ketentuan perusahaan sehingga menghasilkan *passage plan* yang baik agar kapal dapat selamat dan tepat waktu sampai ketempat tujuan. Pada akhir skripsi Penulis menyajikan kesimpulan dan saran.

Kata kunci : *Electronic Chart Display And Information System* (ECDIS), *Passage Plan*.

ABSTRACT

SETYANGGA NUR PRATAMA, 2019. NIT : 51145262.N, "*Analysis of the Importance of the ECDIS Operation in Making a Passage Plan When Passing Elbe River in the MV. NYK ORION*". Nautical Department Program, Diploma IV Program, Semarang Merchant Marine Polytechnic, Lecture I: Capt. ARIKA PALAPA, M.Si., M.Mar. And Lecture II: OKVITA WAHYUNI, S.ST., M.M.

The Electronic Chart Display And Information System (ECDIS) is a modern development in the navigation system on ships that complies with the regulations of the International Maritime Organization (IMO) and can be used as a substitute for the paper chart. When the author practiced on the MV. NYK Orion the officer does not understand how to operate ECDIS because MV. NYK Orion was equipped with 1 ECDIS for training purpose so that everything related to the passage plan uses a paper chart as its main equipment. After the MV. NYK Orion does a dry dock at Zhousan China, MV. NYK Orion gets a supply 2 pieces of ECDIS so that MV. NYK Orion uses a full ECDIS system as a means of navigation.

The author carried out a direct observation of the ECDIS operation in making passage plan on the Elbe River. To analyze this problem, the author uses 2 methods of data analysis techniques, Fishbone Analysis and USG. The Fishbone analysis method is used to analyze the factors that cause ECDIS operation for passage planning not in accordance with the SOP. The factors obtained from fishbone analysis then analyzed using the USG method to obtain the most dominant factors and an overview of the efforts that must be made to overcome these problems. So that later a solution can be obtained to overcome the problems in ECDIS operations for passage planning.

By carrying out these efforts, it is hoped that it can improve the ability of officers to operate ECDIS when making a passage plan in accordance with company provisions so as to produce a good passage plan so that the ship can be safe and on time to the destination. At the end of the mini thesis the author presents conclusions and suggestions.

Key words : *Electronic Chart Display And Information System (ECDIS), Passage Plan.*

BAB I

PENDAHULUAN

A. Latar Belakang

Transportasi telah menjadi kebutuhan manusia di zaman sekarang. Transportasi merupakan hasil karya yang dapat memudahkan manusia melakukan aktifitasnya baik itu dalam pekerjaan maupun hiburan. Transportasi telah dikenal oleh masyarakat baik itu dari masyarakat kalangan bawah sampai masyarakat kalangan atas. Transportasi mempunyai banyak jenis mulai dari darat, kereta api, laut, sungai, udara, contohnya : mobil, sepeda motor, kapal laut, pesawat terbang.

Menurut Utomo, transportasi adalah pemindahan barang dan manusia dari tempat asal ke tempat tujuan. Sedangkan menurut Sukarto, transportasi adalah perpindahandari suatu tempat ke tempat lain dengan menggunakan alat pengangkutan, baik yang digerakkan oleh tenaga manusia, hewan (kuda, sapi, kerbau), atau mesin. Konsep transportasi didasarkan pada adanya perjalanan (*trip*) antara asal (*origin*) dan tujuan (*destination*). (<http://zonageograp.blogspot.com/2011/11/pengertian-transportasi.html>)

Salah satu peran penting transportasi pada zaman sekarang adalah meperlancar arus peredaran dan pemerataan barang di tiap-tiap daerah atau negara. Karena dengan adanya transportasi yang baik, daerah-daerah / negara-negara dengan sumber daya yang berbeda dapat dijangkau dan dicukupi kebutuhannya berdasarkan kekurangan yang ada. Maka dari itu dibutuhkan suatu alat transportasi yang dapat mengangkut muatan dalam jumlah yang besar dengan biaya seminimal mungkin. Jenis alat transportasi yang cocok dengan kriteria tersebut adalah alat transportasi laut yang berupa kapal. Seperti yang kita ketahui bahwa kapal dapat berlayar untuk mengangkut muatan dalam jumlah banyak dan menempuh jarak yang sangat jauh dengan biaya yang lebih sedikit.

Pada saat kapal melakukan pelayaran, yang perlu dilakukan terlebih dahulu adalah membuat suatu rencana pelayaran, yang dalam hal ini lebih ditujukan pada pembuatan/penentuan arah-arah (haluan) yang harus ditempuh sejak dari tempat bertolak atau tempat berangkat hingga ke tempat tujuan atau tempat tiba. Pekerjaan ini lazim disebut dengan perencanaan trek pelayaran. Dalam membuat suatu rute pelayaran haruslah memegang prinsip bahwa pelayaran yang akan ditempuh harus dapat terselenggara dengan selamat dan efisien. Selamat artinya bagaimana kapal harus menetapkan haluan yang tepat/benar agar selama pelayarannya terhindar dari rintangan-rintangan yang ada di laut, misalnya karang, pusaran air dan lain sebagainya hingga tiba di tempat tujuan dengan selamat, baik yang menyangkut jiwa manusia maupun seluruh barang yang berada di dalamnya. (Bagian Proyek Pengembangan Kurikulum Dikmenjur, 2003).

Keselamatan merupakan hal yang perlu diperhatikan karena hal tersebut merupakan faktor utama guna tercapainya peredaran dan pemerataan barang di berbagai daerah. Efisien berarti bahwa pelayaran harus ditempuh dalam waktu yang singkat dan bagaimana agar bahan bakar serta bahan makanan yang digunakan selama pelayaran tersebut dapat ditekan seminimal mungkin agar biaya yang dikeluarkan sedikit, maka dari itu rancangan pelayaran yang baik harus selalu diterapkan di atas kapal. Pada era modern sekarang seiring berkembangnya teknologi, kapal-kapal telah dilengkapi dengan peralatan-peralatan canggih, guna meningkatkan presentase keselamatan awak kapal maupun muatan, salah satunya adalah ECDIS (*Electronic Chart Display and Information System*). ECDIS merupakan salah satu peralatan utama navigasi kapal.

Seperti kepanjangannya yaitu *Electronic Chart Display and Information System*, atau sistem informasi dan tampilan peta elektronik, maka ECDIS adalah sistem navigasi dengan mengandalkan tampilan peta secara elektronik yang dihubungkan dengan berbagai peralatan navigasi lainnya di anjungan seperti *Global Positioning System* (GPS), kemudi kapal, Radar, AIS, dan sistem manajemen keselamatan (SMS), serta peralatan navigasi lain di anjungan, yang secara keseluruhan adalah untuk merencanakan pelayaran, memonitor posisi

kapal selama pelayaran sehingga kapal berlayar dengan aman dan selamat yang lebih efisien dibanding dengan sistem konvensional sebelumnya. (<http://hadisupriyono.blogspot.com/2012/09/electronic-chart-display-and.html>)

Akan tetapi, menurut pengalaman penulis selama melaksanakan praktek laut di kapal MV. NYK Orion pada kenyataannya para pelaut yang bekerja di atas kapal kurang memahami tata cara pengoperasian ECDIS baik dalam pengoperasian dasar maupun dalam *passage planning*, dikarenakan pada awalnya kapal MV. NYK Orion hanya dilengkapi dengan 1 buah ECDIS yang belum berfungsi sebagai alat navigasi utama melainkan hanya sebagai alat pelengkap navigasi dan sarana *training* untuk Muallim sehingga segala sesuatu yang berhubungan dengan *passage plan* masih menggunakan sarana *paper chart* sebagai alat utamanya. Setelah kapal MV. NYK Orion melakukan *dry dock* di Zhousan China, kapal MV. NYK Orion mendapatkan *supply* 2 buah ECDIS keluaran terbaru untuk menggantikan ECDIS yang lama dan menggantikan fungsi *paper chart* sebagai sarana dalam pembuatan *passage plan* sehingga kapal MV. NYK Orion menggunakan sistem *full* ECDIS sebagai sarana navigasi. Oleh karena itu Muallim kurang memperhatikan faktor-faktor dalam pembuatan rancangan pelayaran dengan baik karena belum terbiasa dengan ECDIS. Mereka hanya membuat suatu rancangan pelayaran berdasarkan apa yang telah lalu tanpa melihat kondisi yang ada saat ini. Padahal untuk membuat suatu rancangan pelayaran perlu mengikuti tahapan-tahapan prosedur yaitu tahap pengumpulan dan penilaian data (*appraisal*), perencanaan rute pelayaran (*planning*), pelaksanaan rute pelayaran (*execution*), dan pengawasan rute pelayaran (*monitoring*).

Dalam hal ini peneliti memilih untuk melakukan penelitian tentang pengoperasian ECDIS untuk *passage planning* di Elbe River dikarenakan oleh beberapa keuntungan, yaitu:

1. Efisiensi waktu dan bahan bakar untuk pelayaran di Eropa, khususnya dari Belanda ke Jerman.
2. Lebih aman karena dibutuhkan konsentrasi oleh perwira yang cukup lama untuk melewati perairan Elbe River.

Terdapat beberapa batasan-batasan keamanan di dalam Elbe River seperti batasan draft maksimum kapal, dan apabila hal-hal tersebut terjadi atau bahkan sampai dilanggar maka akan terjadi keadaan yang buruk untuk kapal misalnya kandas (*grounding*) yang terjadi pada kapal MV. CSCL Indian Ocean pada tanggal 3 Februari 2016 Rabu malam pada pukul 21.20 UTC ketika kapal sedang menuju ke pelabuhan Hamburg. Kapal dengan panjang (*LOA*) 399.6 m dan lebar 58.6 m itu kandas karena adanya kesalahan mesin (*mechanical failure*).

Upaya untuk menanggulangi kapal pada sekitar tengah hari waktu setempat tidak berhasil. Insiden ini telah menyebabkan dampak kecil terhadap lalu lintas kapal di Sungai Elbe.

[\(https://gcaptain.com/cscl-indian-ocean-worlds-biggest-ships-hard-aground-in-elbe-rive/\)](https://gcaptain.com/cscl-indian-ocean-worlds-biggest-ships-hard-aground-in-elbe-rive/)

Selain itu juga ada faktor manusia yang dapat menyebabkan kecelakaan seperti, kecerobohan didalam menjalankan kapal, kurang mampunya awak kapal dalam menguasai berbagai permasalahan yang mungkin timbul dalam operasional kapal, secara sadar memuat kapal secara berlebihan, atau tidak

melaksanakan prosedur *passage plan* dengan baik dan benar. Jenis kecelakaan yang terjadi rata-rata adalah tenggelam (*sinking*), kandas (*grounding*), tubrukan (*collision*), kebakaran (*fire onboard*) dan jenis kecelakaan lainnya. Untuk itu perlu adanya jaminan layanan transportasi yang dilengkapi dengan jaminan keselamatan akan memberikan rasa kepastian dan ketenangan bagi para pengirim barang, sehingga kegiatan sosial ekonomi masyarakat dapat terlindungi selama dalam perjalanan.

Rute-rute suatu pelayaran niaga terbagi menjadi 2 (dua) jenis, yaitu rute pelayaran tetap (*liner service route*) dan rute pelayaran tidak tetap (*tramp service route*). Tentu saja dalam melaksanakan rute-rute pelayaran ini suatu kapal memiliki permasalahan. Tidak adanya jaminan rasa aman, selalu merasa was-was baik di sebagian perjalanan, maupun perjalanan sambungannya, ataupun seluruh proses perjalanannya. Penilaian resiko (*Risk assessment*) adalah bagian dari *Safety Management System* (SMS) yang harus diperhatikan, karena sangat berkontribusi dalam terjadinya *human error*, maka dari itu harus selalu diperbaiki dan dikembangkan agar meminimalisir kejadian yang tidak diharapkan.

Berdasarkan permasalahan di atas maka peneliti merasa perlu diadakannya suatu penelitian yang berdasarkan uraian-uraian diatas mengenai pengoperasian ECDIS untuk rute-rute pelayaran khususnya pada rute pelayaran tetap (*liner service route*) yang melalui Elbe River. Sehubungan dengan hal tersebut, maka peneliti mengangkat judul pada penelitian ini yaitu **“Analisis pentingnya mengoperasikan ECDIS dalam pembuatan *passage plan* ketika melewati Elbe River di kapal MV. NYK Orion”**.

B. Perumusan Masalah

Dari latar belakang masalah di atas, peneliti menemukan permasalahan yang ingin diungkapkan dalam penelitian ini yaitu **“Analisis pentingnya mengoperasikan ECDIS dalam pembuatan *passage plan* ketika melewati Elbe River di kapal MV. NYK Orion”**. Perumusan masalah tersebut akan mempermudah kita dalam melakukan penelitian, mencari jawaban yang tepat dan sesuai. Terdapat beberapa permasalahan yang kiranya menjadi pertanyaan dan membutuhkan jawaban, yang akan dibahas pada pembahasan bab-bab selanjutnya dalam penelitian ini. Perumusan masalah dalam penelitian ini, yaitu.

1. Faktor-faktor apa sajakah yang menyebabkan pengoperasian ECDIS untuk *passage planning* tidak sesuai dengan SOP ?
2. Apakah upaya yang harus dilakukan untuk menanggulangi pengoperasian ECDIS yang tidak sesuai dengan SOP ?

C. Tujuan Penelitian

Suatu kegiatan yang baik dan terarah tentu mempunyai tujuan yang ingin dicapai dan diperoleh. Demikian juga dalam penelitian penelitian ini peneliti mempunyai tujuan yaitu.

1. Untuk mengidentifikasi faktor-faktor apa sajakah yang menyebabkan pengoperasian ECDIS untuk *passage planning* tidak sesuai dengan SOP perusahaan.
2. Untuk menganalisa apakah upaya yang harus dilakukan untuk menanggulangi pengoperasian ECDIS yang tidak sesuai dengan SOP.

D. Manfaat penelitian

1. Manfaat Teoritis

Hasil penelitian ini diharapkan dapat memberikan manfaat bagi dunia pendidikan khususnya ilmu Nautika dalam kawasan pengembangan khususnya perpustakaan sebagai pusat sumber belajar dan informasi yang dapat memberikan pelayanan prima (*Service Excellence*) kepada masyarakat serta pemanfaatan dan pengembangan media informasi di perpustakaan dalam memberikan kontribusi terhadap peningkatan kualitas pembelajaran terutama dalam penyelesaian penelitian.

- a. Sebagai bahan perbandingan antara ilmu teori yang didapat dari kampus dengan ilmu yang didapat pada saat melaksanakan praktek diatas kapal.
- b. Dapat memberikan perbendaharaan perpustakaan Politeknik Ilmu Pelayaran Semarang dan bermanfaat untuk memberikan sumbangan pikiran bagi perusahaan NYK-SM dan perusahaan pelayaran pada umumnya dalam hal pengoperasian kapal-kapal yang berlayar dengan menggunakan rute pelayaran tetap (*liner service*).
- c. Memenuhi persyaratan kelulusan dari program Diploma IV jurusan nautika di Politeknik Ilmu Pelayaran (PIP) Semarang dengan gelar Sarjana Sains Terapan (S.Tr.Pel.).

2. Manfaat Praktis

Hasil penelitian ini diharapkan dapat memberikan manfaat bagi *crewing officer* diatas kapal sebagai bahan pertimbangan dalam pembuatan rancangan pelayaran (*passage plan*) menggunakan ECDIS (*Electronic Chart Display and Information System*)

E. Sistematika penulisan

Untuk mempermudah mengetahui pokok-pokok permasalahan dan bagian-bagian penelitian ini maka dalam penelitian penelitian ini terbagi menjadi beberapa bagian. Di dalam penelitian ini juga tercantum halaman persetujuan, halaman pengesahan, halaman motto dan persembahan, kata pengantar dan daftar isi. Tak lupa pada akhir penelitian ini juga diberikan kesimpulan dan saran sesuai pokok permasalahan. Pada bagian isi dari penelitian ini terbagi menjadi lima pokok bahasan yaitu.

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BAB II

LANDASAN TEORI

A. Tinjauan Pustaka

1. ECDIS (*Electronic Chart Display and Information System*)

ECDIS (*The Electronic Chart Display and Information System*) merupakan pengembangan modern dalam sistem grafik navigasi yang digunakan diatas kapal yang sesuai dengan peraturan *International Maritime Organization* (IMO) dan dapat digunakan sebagai alternatif untuk kertas grafik bahari. Dengan menggunakan sistem berbasis elektronik grafik, mempermudah perwira kapal dalam bernavigasi untuk memonitor lokasi kapal, daerah sekitar kapal beserta kapal – kapal terdekat dan membuat rancangan pelayaran .

Sesuai dengan SOLAS *Chapter V Regulation 19/2.1.4* mengenai *carriage requirements for shipborne navigational systems and equipment* (persyaratan pengangkutan untuk sistem dan peralatan navigasi kapal) menjelaskan bahwa.

All ships, irrespective of size, shall have nautical charts and nautical publications to plan and display the ship's route for the intended voyage and to plot and monitor positions throughout the voyage. An electronic chart display and information system (ECDIS) is also accepted as meeting the chart carriage requirements of this subparagraph. Ships to which paragraph 2.10 applies shall comply with the carriage requirements for ECDIS detailed therein.

Dengan penjelasan sebagai berikut.

Semua kapal, terlepas dari ukurannya, harus memiliki grafik bahari dan publikasi bahari untuk merencanakan dan menampilkan rute kapal untuk pelayaran yang dimaksudkan dan untuk merencanakan dan memantau

posisi di seluruh pelayaran. Sebuah *Electronic Chart Display And Information System* (ECDIS) diterima sebagai alat yang memenuhi persyaratan pengganti peta dari sub-paragraf ini. Kapal yang menerapkan paragraf 2.10 harus mematuhi persyaratan pengangkutan untuk ECDIS yang terperinci di dalamnya.

The principles of navigation have not changed, but the method and technique of navigation has been impacted by ECDIS. This Standard has been developed with the aim to provide navigators and ship management companies' instructions, recommendations and best practices related to the configurations on ECDIS and its use as primary means of navigations. (NYK Standard For Navigation Using ECDIS 2014)

Prinsip dari navigasi belumlah berubah, tetapi metode dan teknik bernavigasi telah dipengaruhi oleh adanya ECDIS. Standar ini telah dikembangkan dengan tujuan untuk memberikan petunjuk dan rekomendasi kepada navigator dan perusahaan manajemen kapal, serta penerapan terbaik terkait dengan konfigurasi pada ECDIS dan itu digunakan sebagai sarana utama navigasi.

Sebuah sistem yang ada pada ECDIS menampilkan informasi dari *Electronic Navigational Chart* (ENC) atau *Digital Charts Nautical* (DNC) dan mengintegrasikan informasi posisi dari posisi dan kecepatan melalui sistem referensi air dan sensor navigasi opsional lainnya. Sensor lain yang dapat antarmuka dengan ECDIS adalah Radar, NAVTEX, sistem identifikasi otomatis (AIS), Pelayaran Arah dan fathometer.

ECDIS ini menjanjikan berbagai kelebihan antara lain:

- a. *Efficient*: Sistem ini menjanjikan penyusunan rancangan pelayaran dapat dilakukan dengan cara yang lebih efisien. Karena sistem ini mampu

mengakomodasi penyusunan rancangan pelayaran tidak hanya satu rute saja, termasuk keadaan cuaca, arus pasang surut, pemilihan peta, dan hal-hal lain yang diperlukan dalam penyusunan rancangan pelayaran dapat dilakukan secara otomatis dan sesuai dengan parameter yang disyaratkan oleh perusahaan.

- b. *Chart Management and digital publication*: Pemilihan peta yang akan digunakan pada sebuah kapal dapat dipilih secara digital, termasuk pemesanan peta yang dibutuhkan dapat dilakukan secara *online*, serta koreksi peta dapat dilakukan secara otomatis, tidak perlu melakukan koreksi secara manual dengan menggunakan terbitan Berita Pelaut (BPI) atau *Notice to Mariner* (NTM).
- c. *Display of information*: Tampilan berbagai informasi tentang pelayaran dapat dilihat pada satu monitor, termasuk daerah-daerah larangan berkaitan dengan pemberlakuan MARPOL, daerah berbahaya ancaman perompakan di laut, daerah-daerah bahaya navigasi lainnya, termasuk adanya kapal-kapal lain di sekitar kapal sendiri, informasi tentang cuaca, informasi lengkap tentang karakter pelampung, suar dan sebagainya, dapat dilihat pada satu monitor.
- d. *Integration*: Sebagaimana tadi sudah didefinisikan, berbagai macam peralatan navigasi di anjungan dapat diintegrasikan sehingga pengoperasiannya dapat lebih praktis dapat dilayani oleh satu orang. *Bridge Navigation Watch Alarm System* (BNWAS) yang juga disyaratkan oleh IMO, juga dapat diintegrasikan dengan ECDIS.

Mengoperasikan beberapa peralatan seperti RADAR, ECDIS, CONNING, AMS, dan E-LOG Book dapat dilakukan di satu tempat kerja.

- e. *Saves*: Dengan semua kelebihan yang dimiliki ECDIS ini, dapat memberikan keuntungan bagi perusahaan pelayaran untuk membiayai operasi kapal-kapalnya.

2. *Passage Planning*

Sebelum melaksanakan suatu pelayaran, maka terlebih dahulu harus dibuat rencana pelayaran, yang dalam hal ini lebih ditujukan pada pembuatan/penentuan arah-arah (haluan) yang harus ditempuh sejak dari tempat bertolak atau tempat berangkat hingga ke tempat tujuan atau tempat tiba. Pekerjaan ini lazim disebut dengan perencanaan trek pelayaran.

Rancangan pelayaran merupakan suatu cara atau metode, untuk memperkecil kemungkinan timbulnya resiko bahaya/pelanggaran atau kesalahan navigasi kapal. Rancangan pelayaran diperlukan untuk mendukung pelaksanaan dari ***Bridge Team Management*** atau ***Bridge Resource Management***, dan untuk memastikan bahwa kapal dapat dilayarkan dengan aman dari pelabuhan tolak sampai dengan pelabuhan tiba (dari dermaga ke dermaga pelabuhan). Adapun pelayaran yang akan dilayari harus telah direncanakan dengan seksama dengan mempertimbangkan serta memperhitungkan semua informasi penting perihal navigasi pelayaran. (Agus Subardi, 2017 : 1)

Dalam membuat suatu trek pelayaran haruslah memegang prinsip bahwa pelayaran yang akan ditempuh harus dapat terselenggara dengan selamat dan efisien. Selamat artinya bagaimana kapal harus menetapkan haluan yang tepat/benar agar selama pelayarannya terhindar dari rintangan-rintangan yang ada di laut, misalnya karang, dan lain sebagainya hingga tiba di tempat tujuan dengan selamat, baik yang menyangkut jiwa manusia maupun seluruh barang yang berada di dalamnya.

Efisien mengandung arti bahwa pelayaran dapat ditempuh dalam waktu yang singkat. Efisien lebih ditekankan pada unsur ekonomi yaitu bagaimana agar bahan bakar serta bahan-makanan yang digunakan selama pelayaran dapat seminimal mungkin. Dari dua indikator di atas, selamat dan aman, unsur keselamatan masih lebih diutamakan.

Sesuai SOLAS (*Safety of Life at Sea*) chapter V reg. 34 mengenai *safe navigation and avoidance of dangerous situations* (navigasi aman dan pencegahan situasi darurat) menjelaskan bahwa.

Prior to proceeding to sea, the master shall ensure that the intended voyage has been planned using the appropriate nautical charts and nautical publications for the area concerned, taking into guidelines and recommendations developed by the Organization. The voyage plan shall identify a route which:

- a. *Takes into account any relevant ship's routing system;*
- b. *Ensures sufficient sea room for the safe passage of the ship throughout the voyage;*
- c. *Anticipates all known navigational hazards and adverse weather conditions; and*
- d. *Takes into account the marine environmental protection measures that apply, and avoids, as far as possible, actions and activities which could cause damage to the environment.*

Dengan penjelasan sebagai berikut.

Sebelum berlayar, seorang Nakhoda harus memastikan terlebih dahulu bahwa pelayaran yang dimaksudkan telah direncanakan menggunakan peta-peta navigasi dan publikasi nautika yang sesuai untuk area pelayaran yang dimaksud, yang diambil dari pedoman dan rekomendasi yang telah dibuat oleh organisasi. Rancangan pelayaran harus mengidentifikasi sebuah rute yang.

- a. Memperhitungkan sistem rute kapal yang sesuai.
- b. Menjamin ruang gerak laut yang cukup bagi kapal selama berlayar.

- c. Mengantisipasi semua bahaya navigasi yang dikenal dan kondisi cuaca buruk.
- d. Memperhitungkan tindakan perlindungan lingkungan laut yang sudah dilaksanakan, menghindari, apabila mungkin, semua tindakan dan kegiatan yang dapat merusak lingkungan.

Dengan penjelasan dari SOLAS (*Safety of Life at Sea*) tersebut dapat dikatakan bahwa dalam suatu rancangan pelayaran yang dibuat oleh perwira kapal harus tetap memperhitungkan keselamatan kapal dan seluruh awak kapal, selain itu juga tetap melindungi kelestarian lingkungan laut, dengan cara memperhitungkan rute kapal yang akan dilayari maupun keadaan cuaca yang mungkin terjadi selama pelayaran dan segala kebutuhan operasional kapal selama berlayar, sehingga dapat menjamin ruang gerak kapal dalam berolah gerak selama berlayar. Karena semakin lama kebutuhan pokok semakin meningkat maka dari itu sangat penting untuk mendistribusikan container secara efisien dan tepat waktu dan perusahaan pelayaran juga menginginkan keuntungan dari pemilik muatan. Maka dari itulah perlunya diadakannya rute pelayaran tetap (*liner service*) agar keberangkatan dan kedatangan dari suatu komoditi dapat terjadwal. Untuk melaksanakan suatu pelayaran perlu mengikuti tahapan-tahapan prosedur yaitu tahap pengumpulan dan penilaian data (*appraisal*), perencanaan rute pelayaran (*planning*), pelaksanaan rute pelayaran (*execution*), pengawasan rute pelayaran (*monitoring*). Lebih lanjut penjelasan secara rinci adalah sebagai berikut.

a. Pengumpulan dan Penilaian Data (*Appraisal*)

Nakhoda berkonsultasi dengan para Mualimnya dalam hal mempertimbangkan semua variabel informasi yang berhubungan dengan rute yang akan dilayari, baik variabel internal seperti kemampuan olah gerak kapal, status *bunker* kapal, dan juga ETA ke pelabuhan tujuan, maupun variabel eksternal seperti keadaan cuaca, fasilitas *pilotage*, dan keadaan geografis rute tersebut, lalu memutuskan *track* manakah yang harus diambil dan akan dilayari.

b. Perencanaan (*Planning*)

Perwira navigasi membuat garis haluan di peta yang telah sesuai dengan rutanya dan memberikan catatan yang detail dari rencana yang telah disetujui mualim dari berth to berth. Persiapan-persiapan berlayar dengan pandu juga harus dipersiapkan untuk membantu perwira jaga sehubungan dengan keamanan kapal waktu kapal berlayar dengan pandu. Pada pelayaran tetap (*liner service*), terdapat 2 jenis rute yaitu rute yang menuju ke arah timur (*East Bound*) dan rute yang menuju ke arah barat (*West Bound*).

c. Pelaksanaan (*Execution*)

Apabila waktu tolak diketahui, keputusan yang telah diambil harus dipertimbangkan benar-benar. Kondisi penerangan-penerangan, keadaan arus (pasang surut) harus diperhitungkan. Bilamana perlu nakhoda dapat mengatur speed atau memodifikasi haluan-haluan untuk mencapai pelayaran yang lebih menyenangkan.

d. Pengawasan (*Monitoring*)

Pada tahap ini dapat dilaksanakan oleh perwira jaga untuk mengecek setiap menjalankan tugas jaga. Apabila pada saat perwira jaga mendapati suatu keragu-raguan harus segera menghubungi nakhoda, tetapi jika dalam keadaan darurat dapat segera melakukan tindakan.

Tujuan dari tahapan-tahapan prosedur sebelum berlayar adalah menyiapkan navigasi kapal agar pelayaran dapat ditentukan dari dermaga ke dermaga dengan aman dengan memperhatikan kapal-kapal dan lingkungannya. Tanpa perencanaan pelayaran, waktu untuk memproses informasi yang penting/diperlukan tidak dapat dengan segera diperoleh. Ketika navigasi menemui tanda daratan yang meragukan, merubah haluan, menghindari lalu lintas yang padat.

3. Pengertian Analisis

Analisis adalah penyelidikan terhadap suatu peristiwa (karangan, perbuatan, dan sebagainya) untuk mengetahui keadaan yang sebenarnya (sebab-musabab, duduk perkaranya, dan sebagainya), sedangkan menurut Komaruddin (2001:53) Pengertian analisis adalah kegiatan berpikir untuk menguraikan suatu keseluruhan menjadi komponen sehingga dapat mengenal tanda-tanda komponen, hubungannya satu sama lain dan fungsi masing-masing dalam satu keseluruhan yang terpadu.

4. Pelayaran tetap (*liner service*)

Pelayaran tetap atau kata lain dari (*voyage liner service*) adalah pelayaran yang dijalankan secara tetap dan teratur, baik dalam hal

keberangkatan maupun kedatangan kapal di pelabuhan, dalam hal trayek (wilayah operasi), dalam hal tarif angkutan serta dalam hal syarat - syarat dan perjanjian pengangkutan. Di pihak lain, Menurut Sumardi (2000:6) pelayaran tetap (*voyage line service*) adalah pelayaran dalam negeri maupun luar negeri yang menjalani trayek tetap dan teratur waktunya.

Berdasarkan definisi di atas dapat disimpulkan bahwa pelayaran tetap (*voyage liner service*) adalah pelayaran yang dijalankan secara tetap dan teratur baik dalam negeri maupun pelayaran luar negeri yang menjalani trayek tetap dan teratur waktunya.

5. Jenis-jenis Pelayaran.

Menurut luas wilayah operasi pelayaran antara lain.

a. Pelayaran Lokal

Pelayaran Lokal yaitu pelayaran yang bergerak dalam batas daerah atau lokalitas tertentu di dalam satu propinsi atau dalam propinsi-propinsi, luas wilayah operasi pelayaran lokal tidak lebih dari 200 mil. Untuk kapal yang digunakan dibawah 200 DWT. Contohnya pelayaran dari Makasar ke Tanjung Bira, dari Surabaya ke Madura..

b. Pelayaran Nusantara

Pelayaran Nusantara yaitu pelayaran pantai atau pelayaran antar pulau. Bentuk pelayaran ini meliputi seluruh wilayah perairan negara tetapi tidak sampai menyebrang keluar wilayah territorial negara tersebut. Pelayaran nusantara memiliki wilayah operasi di seluruh wilayah negara. Kapal yang digunakan kurang dari 3000 DWT. Contoh Pelayaran dari Tokyo ke Hokkaido atau dari Makasar ke Surabaya

c. Pelayaran Samudera

Pelayaran Samudera yaitu jenis pelayaran yang beroperasi melalui samudera dan perairan internasional lainnya, serta bergerak antara satu negara lainnya untuk mengangkut barang ekspor-impor dari ke negara-negara tertentu di dunia, contoh dari Le Havre ke Singapore atau dari San Francisco ke Busan.

6. Pengertian *Elbe River* (Sungai Elbe)

The Elbe extends for 1,091 kilometres from its source in the Giant Mountains in the Czech Republic to where it meets the North Sea. Of this, around 870 kilometres are navigable. The river falls into two sections – the Lower Elbe for the stretch of around 145 kilometres from the estuary to the Port of Hamburg, and the Upper Elbe for the upriver section further inland.

Ships with a maximum draft of 12.80 metres can arrive and leave the port irrespective of tide at any time. Using the tidal surge for covering the stretch of river from North Sea as far as Hamburg, drafts of up to 15.10 metres are possible. Making allowance for the tide, in the other direction drafts of up to 13.80 metres are feasible.

(<https://www.hafen-hamburg.de/en/the-river-elbe>)

Sungai Elbe memanjang sejauh 1.091 kilometer dari sumbernya di Pegunungan Raksasa di Republik Ceko ke tempat ia bertemu dengan Laut Utara. Dari jumlah ini, sekitar 870 kilometer dapat dilayari. Sungai itu terbagi ke dalam dua bagian yaitu Sungai Elbe Bawah untuk bentangan sekitar 145 kilometer dari muara ke Pelabuhan Hamburg, dan Elbe Atas untuk bagian hulu ke pedalaman lebih jauh.

Kapal dengan *draft* (sarat) maksimum 12,80 meter dapat tiba dan meninggalkan pelabuhan terlepas dari pasang kapan saja. Menggunakan gelombang pasang untuk menutupi bentangan sungai dari Laut Utara sampai ke Hamburg, draft hingga 15.10 meter masih memungkinkan untuk

lewat. Membuat penyisihan untuk air pasang, di sisi lain *draft* hingga 13,80 m masih layak.

Mega-containerships and bulk carriers deployed worldwide meanwhile have drafts that as a rule exceed the maximum at present permissible on the Lower and Outer Elbe. This applies especially to the containerships on the East Asia trade route that is of such importance for the Port of Hamburg.

Ships can currently arrive at and leave the Port of Hamburg under the following conditions (based on a target vessel with 300 m length, 32 m width and 13.50 m draft):

- a. *Arrive irrespective of the tide: max. 12.80 m draft**
- b. *Leave irrespective of the tide: max. 12.80 m draft**
- c. *Arrive depending on tide: max. 15.10 m draft**
- d. *Leave depending on tide: max. 13.80 m draft**

**fresh water*

On the Lower Elbe between Glückstadt and Port of Hamburg ship encounters, or the passing of two ships, are only possible when their combined width does not exceed 90 metres.

<https://www.hafen-hamburg.de/en/adjustment-navigation-channel>

Kapal-kapal kontainer dengan ukuran super dan kapal-kapal curah yang ada di seluruh dunia sementara ini memiliki *draft* (sarat) yang secara aturan melebihi maksimum yang saat ini diizinkan untuk melewati sungai Elbe Bawah dan Luar. Ini berlaku terutama untuk kapal kontainer di rute perdagangan Asia Timur yang sangat penting bagi Pelabuhan Hamburg.

Kapal saat ini dapat tiba di dan meninggalkan Pelabuhan Hamburg dalam kondisi berikut (berdasarkan kapal target dengan panjang 300 m, lebar 32 m dan 13,50 m *draft*):

- a. Tiba terlepas dari pasang: maksimal 12.80 m *draft**
- b. Tolak terlepas dari pasang: maksimal. 12.80 m *draft**
- c. Tiba tergantung pada pasang: maksimal 15.10 m *draft**
- d. Tolak tergantung pada pasang: maksimal 13.80 m *draft**

**air tawar*

Pada Elbe Bawah antara Glückstadt dan daerah pertemuan kapal di pelabuhan Hamburg, atau daerah lewatnya dua kapal, hanya mungkin ketika lebar gabungan mereka tidak melebihi 90 meter.

B. Definisi Operasional

Berikut ini adalah daftar dari istilah-istilah yang penulis gunakan dalam skripsi ini beserta artinya, sehingga memudahkan para pembaca dalam memahami skripsi yang telah disusun oleh penulis.

1. SOLAS : SOLAS (*Safety Of Life At Sea*) merupakan peraturan internasional yang digagas oleh organisasi maritim dunia untuk menjadi pedoman demi mengatur keselamatan pelaut, Demi meningkatkan jaminan keselamatan hidup pelaut.
2. *Chart Permit* : Suatu file yang berisikan data perizinan penggunaan peta
3. Derajah (meridian) : lingkaran besar di bumi yang berjalan dari kutub ke kutub
4. Derajah nol : derajah yang melalui Greenwich (bagian kota London), disebut juga derajah pertama
5. Rimban : sudut yang terbentuk antara garis lunas kapal/haluan yang dikemudikan dengan garis hasil yang dilayari (akibat adanya pengaruh angin dan atau arus)

6. *Draft*/berat : tingginya garis air yang berada pada bagian benaman bawah kulit kapal yang merupakan kumulasi dari berat kapal secara keseluruhan
7. Garis haluan : garis lurus di peta laut yang ditempuh oleh kapal
8. Haluan : sudut antara garis haluan dan salah satu dari ketiga arah utara
9. Haluan magnet : sudut antara garis haluan dan arah Utara magnet (Hm)
10. Haluan pedoman : sudut antara garis haluan dan arah Utara (Hp) pedoman
11. Haluan sejati : sudut antara garis haluan dan arah Utara sejati (Hs)
12. Jajar (paralel) : lingkaran kecil di bumi yang berjalan sejajar dengan katulistiwa
13. Jauh : jarak yang ditempuh oleh kapal dalam waktu tertentu sepanjang permukaan bumi, dinyatakan dalam mil laut
14. Laju : banyaknya mil laut yang ditempuh oleh kapal tiap jam
15. Bujur : busur terkecil pada khatulistiwa, dihitung mulai dari derajat nol sampai derajat yang melalui tempat itu

16. Lintang : busur derajat yang melalui tempat tertentu, dihitung mulai dari katulistiwa sampai jajar tempat tersebut
17. Loksodrom : garis lurus di peta laut yang membentuk sudut-sudut yang sama dengan semua derajat
18. Mil laut : menit dari lingkaran besar pada bumi yang berbentuk bola; 1 mil laut = 1,852 km
19. Pedoman : pedoman yang terjadi oleh penerapan hukum-gyro/gasing hukum gyroskop pada bumi yang berotasi, merupakan instrumen penunjuk arah yang dapat memberikan arah acuan yang tidak banyak menyimpang dari arah derajat di bumi
20. Pedoman magnet : pedoman yang terjadi oleh adanya medan magnet bumi di sekeliling bumi
21. Variasi : sudut antara arah U_s dengan arah U_m , hanya karena pengaruh magnetisme bumi saja
22. Deviasi : sudut antara arah U_m dan arah U_p sebagai akibat dari pengaruh magnetisme kapal.
23. Sembir (salah tunjuk) : sudut antara arah U_s dan arah U_p
24. Tempat tiba : tempat dimana kapal tiba atau kemana kita ingin pergi (lintang/bujur tiba)
25. Tempat tolak : tempat dari mana kapal berlayar (lintang/bujur tolak)

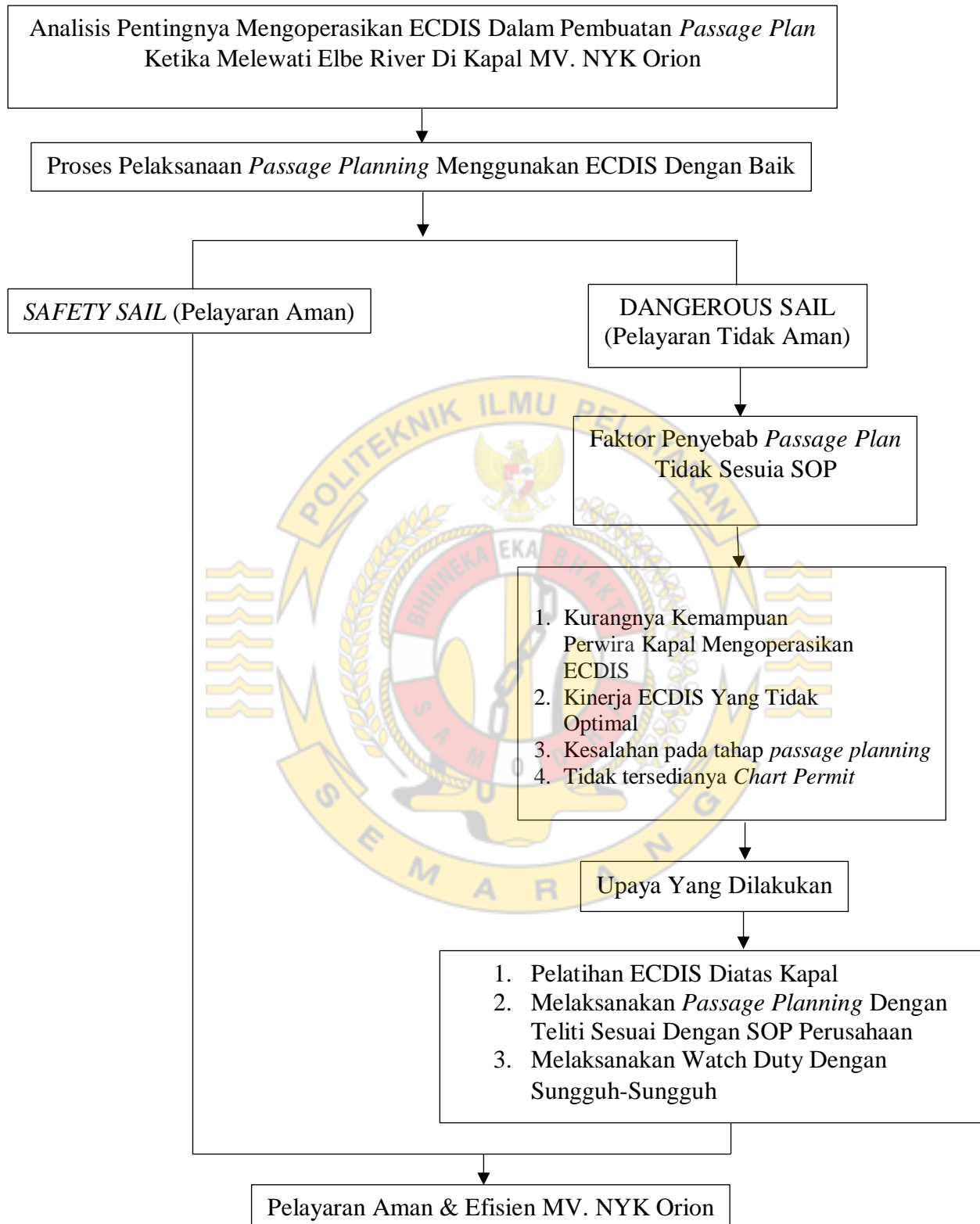
26. *ETD* : *Estimated Time of Departure* adalah perkiraan waktu dimana kapal akan berangkat dari pelabuhan menuju ke pelabuhan selanjutnya.
27. *ETA* : *Estimated Time of Arrival* adalah perkiraan waktu dimana kapal akan tiba pada pelabuhan tujuan.

C. Kerangka Pikir Penelitian

Dalam kerangka berpikir ini penulis ingin mencoba membahas tentang Analisis Pentingnya Mengoperasikan ECDIS Dalam Pembuatan *Passage Plan* Ketika Melewati Elbe River Di Kapal MV. NYK Orion dari Pelabuhan Rotterdam ke Pelabuhan Hamburg (*In Bound*). Dari penjelasan tersebut dapat diuraikan bahwa pada pelayaran yang dilakukan MV. NYK Orion memiliki suatu rancangan pelayaran yang terdiri dari beberapa tahapan, yaitu tahapan penilaian (*appraisal*), tahap perencanaan (*planning*), tahap pelaksanaan (*excecution*), dan tahap pengawasan (*monitoring*) yang harus dibuat menggunakan ECDIS.

Dari beberapa tahapan tersebut akan ditemukan beberapa analisa yang terjadi dalam pelayaran, karena pada pelayaran tersebut dengan rute yang sama terjadi perbedaan, yang kemudian akan dicari masalahnya dengan menganalisa data-data yang ada dengan sesuai kemampuan dan pengetahuan penulis. Pada bagan kerangka pikir penelitian dijelaskan urutan penulis dalam melaksanakan penelitian dan serta penulisan penelitian ini, mulai dari mengetahui persiapan-persiapan yang harus dilakukan untuk rute pelayaran *liner service* dan bagaimanakah implementasi *passage planning* untuk melewati *Elbe River* dengan aman, efektif, dan efisien.

KERANGKA PIKIR PENELITIAN



Gambar 2.1: Bagan kerangka pikir penelitian

BAB V

PENUTUP

A. Kesimpulan

Dari keseluruhan pembahasan yang telah dipaparkan pada bab IV mengenai Analisis pentingnya pengoperasian ECDIS dalam pembuatan *passage plan* ketika melewati Elbe River di kapal MV. NYK Orion, dapat disimpulkan bahwa.

1. Faktor-faktor yang menyebabkan pengoperasian ECDIS untuk *passage planning* tidak sesuai dengan SOP adalah kurangnya kemampuan muallim kapal dalam mengoperasikan ECDIS, kinerja ECDIS yang tidak optimal, tidak tersedianya *chart permit* dan kesalahan dalam tahap *passage planning*.
2. Upaya yang harus dilakukan untuk menanggulangi pengoperasian ECDIS agar sesuai dengan SOP adalah dengan mengadakan familiarisasi kepada setiap muallim yang baru naik kapal tentang cara pengoperasian ECDIS dan penerapan pembuatan *passage plan* sesuai dengan *NYK ECDIS GUIDE BOOK*.

B. Saran

Berdasarkan hasil pembahasan di atas mengenai Analisis pentingnya pengoperasian ECDIS dalam pembuatan *passage plan* ketika melewati Elbe River di kapal MV. NYK Orion maka penulis memberi saran sebagai berikut :

1. Perlu diadakan pelatihan ECDIS diatas kapal sebagai bagian dari familiarisasi alat-alat navigasi di anjungan. Pelatihan ini setidaknya harus

mencakup persiapan awal, operasi mendasar, fungsi dari setiap alat navigasi, perencanaan rute pelayaran dan pemantauan atau *monitoring* rute pelayaran. Pelatihan ini juga harus mencakup informasi terkait yang diperlukan untuk pengoperasian ECDIS yang aman, termasuk tentang semua pembaruan dan perubahan.

2. Dalam meninjau dan merencanakan suatu *passage plan*, penulis menyarankan untuk selalu berusaha mendapatkan semua informasi yang detail mengenai data data internal dan eksternal yang dibutuhkan, serta usahakanlah untuk menggambar *track line* di ECDIS dari tempat tolak ke lokasi tiba dengan teliti dan hati-hati untuk menghindari bahaya-bahaya navigasi di sekitar *track line* .
3. Dalam pelaksanaan dan pengawasan *passage plan*, penulis menyarankan untuk selalu melaksanakan *watch duty* dengan sebaik-baiknya, tentukan pula posisi kapal dengan frekuensi yang baik dan sesuai untuk area tempat kapal berlayar.

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Particulars of m/v NYK ORION (UPDATE:07-MAY-2017)

NATIONALITY	PANAMANIAN	
PORT OF REGISTRY	PANAMA	
OFFICIAL NUMBER	33652-08	
CALL SIGN	3EPU6	
BUILT	13th March 2008,IHI Kure	
OWNERS	ASI SHIPHOLDING 1 S.A.	
CLASS:	NS* MNS* container carrier	
IMO NO.	9312999	
CLASSIFICATION	Class NK,No.081552	
CHARTERERS	NIPPON YUSEN KAISHA	
	Yusen Bldg., 3-2, Marunouchi, 2-Chome, Chiyuda-Ku, Tokyo, Japan	
MANAGERS	NYK SHIPMANAGMENT PTE LTD,SINGAPORE	
	1 Harbourfront Place, #15-01 Harbourfront Tower One, Singapore 098633	

MAIN DIMENSIONS

LENGTH OVERALL	336.00 mtr	
LENGTH BETWEEN PERPENDICULARS	318.30 mtr	
BREADTH MOULDED	45.80 mtr	
DEPTH MOULDED	24.40 mtr	
WHEELHOUSE TO BOW	244.34 mtr	
WHEELHOUSE TO STERN	91.57 mtr	
KEEL TO TOP MAST	61.55 mtr	
FREEBOARD (summer)	5.174 mtr	

TONNAGES

	GROSS	NET	
INTERNATIONAL	98,799 TONS	37,616 TONS	
SUEZ	99,139.77 TONS	98,368.05 TONS	

	DISPLACEMENT	DEADWEIGHT	DRAUGHT
LIGHT VESSEL	35,291 TONS		
SUMMER DRAUGHT	139,816 TONS	104,525 TONS	14.435 mtr

CARGO CAPACITY

CONTAINER CAPACITY,9040 Teu's	HOLD 20 '40'	2250 teu/880 Feu	Add. SPACE 412 Feu
	DECK 20'40'	1430 teu/1594 Feu	TOTAL 20 ' SIZE 8628 Teu
REEFER CONTAINER POINTS		800	

TANK CAPACITY

WATER BALLAST	25,542.25 Cub.M.
HEAVY FUEL OIL	12,356.43 Cub.M.
DISEL OIL	833.54 Cub.M.
FRESH WATER	502.21 Cub.M.

POWER - SPEED - CONSUMPTION

MAIN ENGINE	DU-SULZER 12 RT-FLEX96C,MCR -65,210 KWx100.3 RPM,NOR-55,430 KW x95.0RPM
SPEED(Full loaded)	25.0 kts
ACTING RANGE	33 360 Nm
CONSUMPTION M.E.	250 MT /MCR 65,210 x 100.3 RPM,200 MT/NOR 55,430 kw x 95 RPM
GENERATORS	DAIHATSU DIESEL 8DC-32, 4 x 3440 kW,STEAM TURBINE 2100 Kw
CONSUMPTION A.E.	cca 10.0 MT per day,steam turbine cca 18.0 MT per day
BOW THRUSTER	2 x 2,000 Kw or
PROPELLER	9000 mm, Pitch 8.806 mm

RADIO: INMARSAT TLX / FAX NUMBERS

SATCOM "C" TLX,E-MAIL	435 282 212 / 435282212@satmailc.com
SAT "F" VOICE(PHONE)	764 840 926 Brigde,764 840 927 Captains Cabin,764 840 928 Ship's office
SAT "F" (FAX)	764 840 929
SAT"F" (DATA)	600 929 526 529
SAT"F"(TLX)	VOICE DATA ONLY
E-MAIL	3EPU6@gtships.com
MMSI	352 822 000 NORX

IMO CREW LIST

1.1 Name of ship		1.2 IMO number		1.3 Call sign		1.4 Date of Arrival		1.5 Date and Port of Embarkation		1.6 Name and No. of identity document (seaman's passport)		1.7 Exp. date of identity document (seaman's passport)	
NYK ORION		9312999		3EPU6		4-Jun-17		ROTTERDAM					
2. Port of Arr./Dep.		3. Date of Arrival		5. Last Port of call									
HAMBURG		4-Jun-17		ROTTERDAM									
4. Flag State of ship		5. Last Port of call											
PANAMA		ROTTERDAM											
6.No.	7. Family name, given names	7.1 M/F	8. Rank or rating	9. Nationality	10. Date and place of birth		11. Date and Port of Embarkation		12. Name and No. of identity document (seaman's passport)		13. Exp. date of identity document (seaman's passport)		
1	PALJETAK, PERO	M	MASTER	CROATIAN	28-Sep-61	DUBROVNIK	14-Aug-17	NEW YORK	004160757	20-Oct-2019			
2	RAHMAN, MATIUR	M	C/M	BANGLADESHI	01-Dec-82	NARAYANGANJ	26-Jul-17	GALLE	BF0263672	22-Apr-2020			
3	GUELOS, RITCHE LEONIDA	M	2/M	FILIPINO	18-Nov-75	S BARBARA ILOILO	5-Jun-17	SINGAPORE	EC1908734	14-Aug-2019			
4	BALUYOT, KEIZER CESUMICION	M	3/M	FILIPINO	04-Nov-93	BINGAWAN ILOILO	14-Aug-17	NEW YORK	P3150268A	23-May-2022			
5	ROY, KANISKA	M	C/E	INDIAN	26-Oct-83	DUM DUM, WEST BENGAL	20-Sep-17	SINGAPORE	Z3598775	13-Jul-2026			
6	BARTULOVIC, SINISA	M	1/E	CROATIAN	02-Aug-56	SPLIT	14-Aug-17	NEW YORK	072142007	11-Mar-2021			
7	WIN, ZIN KO KO	M	2/E	MYANMAR	01-Dec-81	YANGON	22-Jul-17	SINGAPORE	MB176630	4-Jun-2020			
8	OBMERGA, DYLAN ELI FERRER	M	3/E	FILIPINO	08-Aug-93	CATANAUAN, QZN	20-Sep-17	SINGAPORE	P3589983A	4-Jul-2022			
9	ESPIRITU, MON EDUARD DIONEDA	M	ELECT	FILIPINO	14-Feb-86	MARIKINA MM	20-Sep-17	SINGAPORE	EC3548135	26-Feb-2020			
10	NUAL, JERSON GLICO	M	HELPER ELECT.	FILIPINO	18-Jul-90	QUEZON CITY	6-Oct-17	SINGAPORE	P1379318A	26-Dec-2021			
11	REYES, ADELITO DUBLIN	M	BSN	FILIPINO	28-Jul-65	TAGBILARAN CITY	20-Sep-17	SINGAPORE	EB9765437	6-Dec-2018			
12	CARANDO, ALAN BANARIA	M	AB-A	FILIPINO	16-Mar-80	BAAO CAM SUR	22-Jul-17	SINGAPORE	EC5738455	19-Oct-2020			
13	CAJUTOL, JAY DURAN	M	AB-B	FILIPINO	10-Apr-85	JOLO SULU	15-Jul-17	HONG KONG	EC6397653	13-Jan-2021			
14	CLENISTA, LOFREDAN RYAN CUBERO	M	AB-C	FILIPINO	01-Nov-91	TAGBILARAN CITY	15-Jul-17	HONG KONG	EC6596740	13-Feb-2021			
15	BAYUDAN, REY EJE	M	OS-A	FILIPINO	30-Dec-92	MAGSAYSAY, OC MDO	22-Jul-17	SINGAPORE	EC7208075	23-Mar-2021			
16	BERNALES, JASON AMOR SUYAT	M	OS-B	FILIPINO	04-Nov-93	QUEZON CITY	22-Jul-17	SINGAPORE	P3475952A	22-Jun-2022			
17	BATILARAN, STEPHEN SOURIBIO	M	OLR-1	FILIPINO	30-Sep-76	S BARBARA ILOILO	22-Jul-17	SINGAPORE	EC7401677	13-Apr-2021			
18	DIENTE, RODOLFO SUGANOB	M	OLR-A	FILIPINO	07-Oct-63	DINGLE ILOILO	22-Jul-17	SINGAPORE	EC7143607	17-Mar-2021			
19	LAS PINAS, RENATO MONTEREDRAMOS	M	OLR-B	FILIPINO	18-Apr-68	MAASIN SO LEYTE	20-Sep-17	SINGAPORE	EC3868426	6-Apr-2020			
20	MANGGANA, ROMIEDEL ARRABIS	M	WPR	FILIPINO	11-Nov-91	CEBU CITY	22-Jul-17	SINGAPORE	P3165821A	24-May-2022			
21	PENALOSA, RIZALDY MENDOZA	M	C/CK	FILIPINO	19-Jun-72	PASIG RIZAL	31-Mar-17	TOKYO	P2304451A	14-Mar-2022			
22	BAGACINA, RUEL MONGE	M	2/CK	FILIPINO	16-Jan-79	IRIGA CITY	31-Mar-17	TOKYO	EC4292676	30-May-2020			
23	CABESAS, RAYMOND GONZALES	M	MSM	FILIPINO	22-Jun-88	CALATAGAN BTS	20-Sep-17	SINGAPORE	EC0776207	5-Apr-2019			
24	OO, MIN	M	DECK CADET-A	MYANMAR	22-Feb-96	YANGON	23-Jan-17	SINGAPORE	MB498585	18-Feb-2021			
25	PRATAMA, SETYANGGA NUR	M	DECK CADET-B	INDONESIA	05-May-96	SLEMAN	22-Jan-17	SINGAPORE	B3325754	2-Mar-2021			
26	KOMARADIA, ANDIKA ADI NUR	M	ENGINE CADET-A	INDONESIA	28-Apr-95	BOYOLALI	22-Jan-17	SINGAPORE	B3325908	2-Mar-2021			

12 Date and signature by master, authorized agent or officer

6/4/2017

CAPT. PALJETAK, PERO
MASTER OF NYK ORION

DAFTAR RESPONDEN

NO	NAMA	JABATAN	NATIONALITY
1	Paljetak, Pero	Captain	CROATIAN
2	Rahman, Matiur	Chief Officer	BANGLADESHI
3	Guelos, Ritche Leonida	Second Officer	FILIPINO

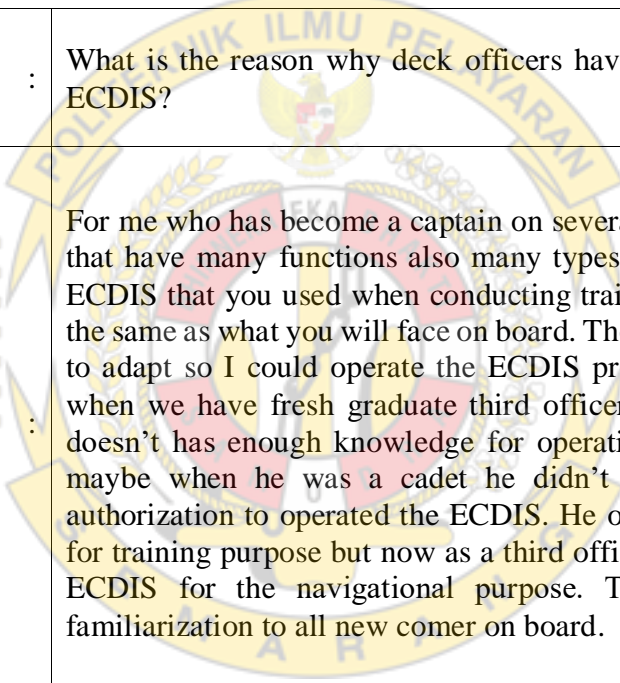
PEDOMAN WAWANCARA

1. What is the reason why deck officers have lack ability to operate ECDIS?
2. Are there any other obstacles in the ECDIS operation on the MV. NYK Orion ?
3. How does the passage planning of Elbe River commenced in MV. NYK Orion ?
4. What efforts should be made to overcome the ECDIS operating problem in MV. NYK Orion?

TRANSKRIP WAWANCARA

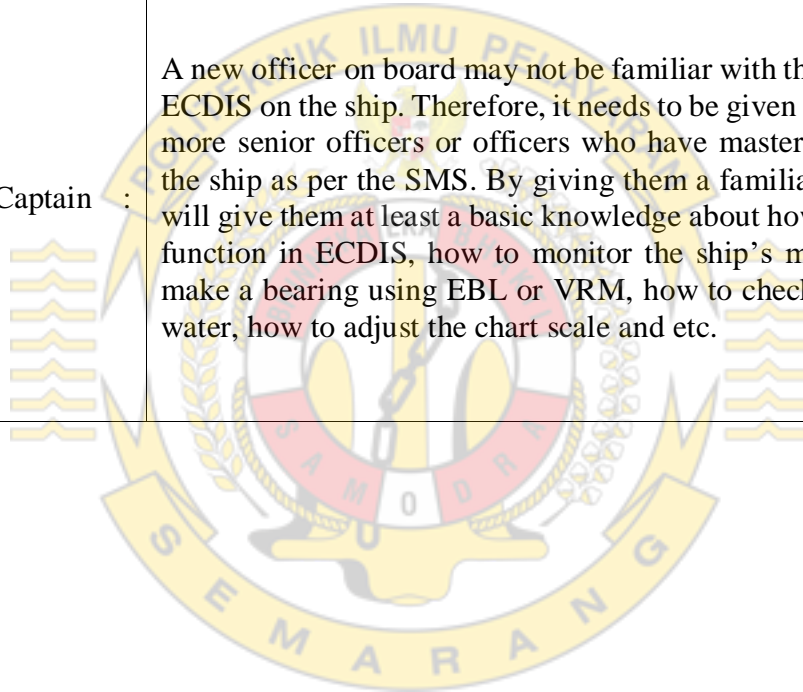
1. Transkrip Wawancara Peneliti dengan Captain kapal NYK Orion

Nama : Paljetak, Pero
Jabatan : Captain NYK Orion
Nationality : Croatian
Hari/Tanggal : Jumat / 01 Juni 2017
Pukul : 0800 LT (UTC+6)
Tempat : Indian Ocean

Peneliti :	What is the reason why deck officers have lack ability to operate ECDIS?
Captain :	 <p>For me who has become a captain on several ships, ECDIS is a tool that have many functions also many types. Sometimes the type of ECDIS that you used when conducting training on land will not be the same as what you will face on board. Therefore I also need a time to adapt so I could operate the ECDIS properly on the ship. And when we have fresh graduate third officer on board of course he doesn't has enough knowledge for operating the ECDIS, because maybe when he was a cadet he didn't have enough time and authorization to operated the ECDIS. He operated the ECDIS only for training purpose but now as a third officer he has to operate the ECDIS for the navigational purpose. That's why we need a familiarization to all new comer on board.</p>
Peneliti :	Are there any others obstacles in the ECDIS operation on the MV. NYK Orion ?

<p>Captain :</p>	<p>The problem of ECDIS in MV. NYK Orion is sometimes there is a difference data of other vessels displayed by ECDIS with those displayed in RADAR / ARPA. But many times I told all of my officer that they should not rely on ECDIS all the time, they have to check and compare with other navigational equipment. Especially when ships are sailing in areas with heavy traffic or narrow channels such as the Elbe River we have to double check all the data of navigational equipment so we can get a valid data. And the other problem is sometimes the chart permit that 2nd officer request to the company and provider takes a long time until the permit is received on board, and of course sometimes he has to make a passage plan with minim data because we haven't receive the chart permit yet.</p>
<p>Peneliti :</p>	<p>How does the passage planning of Elbe River commenced in MV. NYK Orion ?</p>
<p>Captain :</p>	<p>For the appraisal stage of passage planning in Elbe River, we need to look for the necessary information about external and internal factor of passage planning. For external factor, we need data about the weather data such as weather forecasting and also prediction of tides and currents, pilotage facility and local regulations & warnings, and the geographical condition in the Elbe River. For internal factor, we need to know about the ETA (Estimated Time of Arrival) for the destination port, our ship's bunker condition that we can get it from the engine control room, and our ship's maneuverability like turning time, bow thruster power, etc. The next stage of the process is known as the planning stage. Once information is gathered and considered, we can begin the process of actually laying out the voyage. The process involves projecting various future events including high density traffic, narrow channel, and course alteration expected during the passage. This track is judged with respect to at least nine separate criteria given in the Guidelines including under-keel clearance, safe speed, air draft, the use of routing and reporting services (TSS and VTS), and the availability of contingencies in case of emergency. The third stage of passage planning is the execution stage. The IMO was careful to include execution as part of the process of passage planning. This underscores the fact that the Guidelines list a number of tasks that are to be executed during the course of the voyage. It also reiterates my responsibility to treat the plan as a "living document" and to review or change it in case of any special circumstances that should arise. The fourth and final stage of</p>


	<p>voyage planning is the monitoring stage. Once the voyage has begun the progress of the vessel along its planned route must be monitored. This requires that the ship's position be determined, using standard methods including dead reckoning, celestial navigation, pilotage, and electronic navigation. According to the Guidelines, the passage plan should always be available to the officer on watch on the bridge. The Guidelines also specify that deviations from the plan should be clearly recorded and be consistent with other provisions of the Guidelines.</p>
Peneliti :	<p>What efforts should be made to overcome the ECDIS operating problem in MV. NYK Orion?</p>
Captain :	<p>A new officer on board may not be familiar with the operation of the ECDIS on the ship. Therefore, it needs to be given familiarization by more senior officers or officers who have mastered the ECDIS on the ship as per the SMS. By giving them a familiarization on board will give them at least a basic knowledge about how to operate some function in ECDIS, how to monitor the ship's movement, how to make a bearing using EBL or VRM, how to check the depth of the water, how to adjust the chart scale and etc.</p>

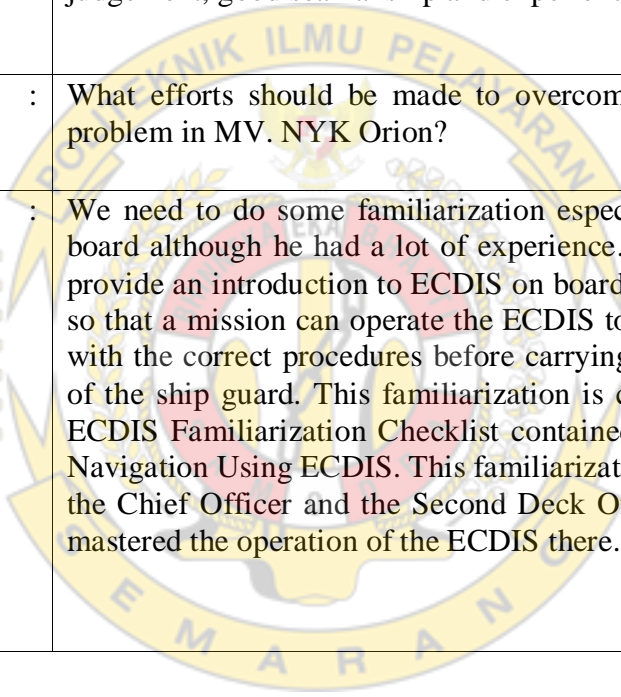


2. Transkrip Wawancara Peneliti dengan Chief Officer kapal NYK Orion

Nama : Rahman, Matiur
 Jabatan : Chief Officer NYK Orion
 Nationality : Bangladeshi
 Hari/Tanggal : Jumat / 01 Juni 2017
 Pukul : 1900 LT (UTC+6)
 Tempat : Indian Ocean

Peneliti :	What is the reason why deck officers have lack ability to operate ECDIS?
C/O :	There are two factor when it comes to lack ability on operating ECDIS. first for me because I have a long period of vacation when I'm going home, so once I join the ship again, everything will be like new for me eventhough I had a lot of experience on ship, but ECDIS is still a new equipment that being established as per SOLAS a few years ago and not all ships already equipped with it. And the second one is because sometimes there are different types of ECDIS on each vessel that make some new on board officer have more job to struggle with it.
Peneliti :	Are there any others obstacles in the ECDIS operation on the MV. NYK Orion ?
C/O :	One of the disadvantages of ECDIS for navigating the ship is the difference in the data of other vessels displayed by ECDIS with those displayed RADAR / ARPA such as course, speed, CPA & TCPA. This has made it difficult for a number of times for officers to analyze the conditions and threats of collisions, especially when ships are sailing in areas with heavy traffic and narrow channels such as the Elbe River.
Peneliti :	How does the passage planning of Elbe River commenced in MV. NYK Orion ?

<p>C/O :</p> 	<p>First what we have to do are appraisal stage, There are two factor for appraisal stage we have to consider, internal factor from your ship and external factor from external condition out there. For external factor, you need data about the weather data such as weather forecasting and also prediction of tides and currents, pilotage facility, and the geographical condition in the Elbe River areas. And for internal factor, you need to know about the your ship's bunker, try to ask this to the Chief Engineer or First Engineer in Engine Control Room, you need to know the maneuverability of your ship, that included with the turning ability, yaw-checking, course-keeping and stopping abilities of the ship, and the last point is you need to know is ETA (Estimated Time of Arrival) for the destination port. The next stage is the planning stage. After you gathered all that data and information, you need to look for the appropriate chart with appropriate scale. After that you will start to draw that passage plan in the ECDIS with consideration of so many aspects such as the bound of the vessel, the density of the traffic inside the river, what I mean with traffic is not about the big ship, but some small coaster that you'll meet inside the river, the course alteration expected during the passage, UKC (Under Keel Clearance) calculation, safe speed, air draft, and the availability of contingencies in case of emergency. And if you have it all in your passage plan, your passage plan is a good one. After you collect the data and finished with planning stage, you'll go to the next stage, we call it execution stage. In this stage, the navigating officers execute the plan that has been prepared. After departure, the speed is adjusted based on the ETA (Estimated Time of Arrival) and the expected weather and oceanographic conditions. The speed should be adjusted such that the ship is not either too early or late at its port of destination. The Master should find out how long his intended voyage is, accounting for water and fuel available. Also to be taken into account are any expected weather changes along the way. In case and ECDIS is being used, appropriate limits must be set with regard to the safety settings. The final stage of passage planning is monitoring. Monitoring is that aspect which takes into account checking of the position of the vessel, such that it remains within the safe distance from any danger areas. Parallel Indexing can be used to maintain safe distance alongside any hazards to navigation</p>
<p>Peneliti :</p>	<p>How does the monitoring stage of Elbe River Passage Plan commenced in NYK Orion?</p>

<p>C/O :</p>	<p>The final stage of passage planning is monitoring. Monitoring is that aspect which takes into account checking of the position of the vessel, such that it remains within the safe distance from any danger areas. Parallel Indexing can be used to maintain safe distance alongside any hazards to navigation. A safe and successful voyage can only be achieved by close and continuous monitoring of the ship's progress along the pre-planned tracks. Situations may arise wherein the navigating officer might feel it prudent to deviate from the plan. In such case, he shall inform the master and take any action that he may deem necessary for the safety of the ship and its crew. This stage is a very important stage wherein all the deck officers contribute their part to execute the plan. This calls for personal judgement, good seamanship and experience.</p>
<p>Peneliti :</p>	<p>What efforts should be made to overcome the ECDIS operating problem in MV. NYK Orion?</p>
<p>C/O :</p> 	<p>We need to do some familiarization especially for new comer on board although he had a lot of experience. Familiarization aims to provide an introduction to ECDIS on board and its basic operations so that a mission can operate the ECDIS to navigate in accordance with the correct procedures before carrying out the responsibilities of the ship guard. This familiarization is carried out based on the ECDIS Familiarization Checklist contained in NYK Standard For Navigation Using ECDIS. This familiarization can be carried out by the Chief Officer and the Second Deck Officer on a ship that has mastered the operation of the ECDIS there.</p>

3. Transkrip Wawancara Peneliti dengan Second Officer kapal NYK

Orion

Nama : Guelos, Ritche Leonida
Jabatan : Second Officer NYK Orion
Nationality : Filipino
Hari/Tanggal : Jumat / 01 Juni 2017
Pukul : 1300 LT (UTC+6)
Tempat : Indian Ocean

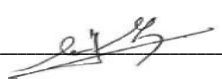
Peneliti :	What is the reason why deck officers have lack ability to operate ECDIS?
2/O :	As a second officer ECDIS is the main tool for my daily job, the reason why some officer have lack ability to operate ECDIS is because when you got ECDIS training on land with using ECDIS simulator the ECDIS will not always be the same type with ECDIS you have on board the ship. There are so many kind of ECDIS type like JRC, FURUNO, etc. And not only that, even you are in the same company but you get different ship for your next contract it will not guarantee you that between previous ship and next ship will have the same type of ECDIS, like when I was in my previous ship I used FURUNO and in this vessel we are using JRC.
Peneliti :	Are there any others obstacles in the ECDIS operation on the MV. NYK Orion ?
2/O :	Before I make a passage plan, I have to update the ENC for maps to be navigated. But before that I had to send a chart permit request to the company and provider via e-mail. This process takes a long time until the permit is received and installed on ECDIS. The obstacle is that several times I have to make a passage plan without any information on the map that will be used as a sailing route because the permit has not been received.
Peneliti :	How does the passage planning of Elbe River commenced in MV. NYK Orion ?

<p>2/O :</p>	<p>For the appraisal stage of passage planning in Elbe River, you need to know about that two factors in appraising phase of passage plan, that was internal and external factor. For internal factor, you need to know about the your ship's bunker, try to ask this to the Chief Engineer or First Engineer in Engine Control Room, you need to know the maneuverability of your ship, that included with the turning ability, yaw-checking, course-keeping and stopping abilities of the ship, and the last point is you need to know is ETA (Estimated Time of Arrival) for the destination port. For external factor, you just need some data about the weather, pilotage facility, and the geographical condition in the Elbe River. After you get all that data I told you, you will come to the planning stage. In this stage you will start to draw that passage plan in the ECDIS with consideration of so many aspects such as the bound of the vessel, the density of the traffic inside the river, what I mean with traffic is not about only the big ship, but some small coaster that you'll meet inside the river, the course alteration expected during the passage, UKC (Under Keel Clarence) calculation, safe speed, air draft, and the availability of contingencies in case of emergency. This is the standard by which the navigator measures progress toward the goal of a safe and efficient voyage, and it is manifested in a well-made passage plan. The third stage of passage planning is the execution stage. In this stage, the navigating officers execute the plan that has been prepared. After departure, the speed is adjusted based on the ETA and the expected weather and oceanographic conditions. The speed should be adjusted such that the ship is not either too early or late at its port of destination. Also to be taken into account are any expected weather changes along the way. In case and ECDIS is being used, appropriate limits must be set with regard to the safety settings. The final stage of passage planning is monitoring. Once the voyage has begun the progress of the vessel along its planned route must be monitored. This requires that the ship's position be determined, using standard methods including dead reckoning, celestial navigation, pilotage, and electronic navigation. Parallel Indexing can be used to maintain safe distance alongside any hazards to navigation. A safe and successful voyage can only be achieved by close and continuous monitoring of the ship's progress along the pre-planned tracks.</p>
<p>Peneliti :</p>	<p>What efforts should be made to overcome the ECDIS operating problem in MV. NYK Orion?</p>

2/O :	<p>A familiarisation should be the main effort that we must do for new comer on board. Familiarization based on the ECDIS Familiarization Checklist contained in NYK Standard For Navigation Using ECDIS should be carried out although the new comer is a captain because we may not be familiar with the operation of the ECDIS on the ship directly when we just join the ship. Therefore, it needs to be given familiarization by the officers who have mastered the ECDIS on board. Familiarization should provide an introduction to ECDIS on board and its basic operations so that a he can operate the ECDIS to navigate in accordance with the correct procedures before carrying out the responsibilities of the ship guard. The materials that needs to be given when familiarizing about ECDIS and its operation on board are initial preparation, basic operation, about the charts in ECDIS, and function for every tools in ECDIS. we have explain to the second officer comer about how to make passage plan based on standart of NYK procedure as per NYK ECDIS GUIDE BOOK so that the passage plan that made will be a good for the safe along the voyage.</p>
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Passage Planning Checklist (Vsl: NYK ORION) Voyage No: <u>45E46</u> From: <u>Rotterdam</u> To: <u>Hamburg</u>		
1	Are the marine charts of the area to be transited (of a large enough scale), including ENC and RNC (if ECDIS equipped) and the publications required available?	<input checked="" type="checkbox"/>
2	Are the marine charts of the area to be transited and the publications required currently corrected the latest NTM and/or electronic updates, T&P? Last Update: 11/01/2016 Last NTM: 02/2016	<input checked="" type="checkbox"/>
3	Have the navigational warnings and sailing route information (refer to ship's routing publications) pertaining to the passage been obtained and have the necessary data been entered on the marine charts?	<input checked="" type="checkbox"/>
4	In deciding on the routing, was reference made to the relevant publications?	<input checked="" type="checkbox"/>
5	Have instructions from the shore staff or administrative guidance from relevant authorities, such as navigational restrictions and tidal windows, been checked?	<input checked="" type="checkbox"/>
6	Does the passage plan anticipate all known navigational hazards and adverse weather conditions?	<input checked="" type="checkbox"/>
7	Has due consideration been given to the traffic density likely to be encountered during the voyage?	<input checked="" type="checkbox"/>
8	Have checks been made on the distances off the coast at the end on the wheel-over points, and also for ensuring sufficient sea room at all stages for safe passage?	<input checked="" type="checkbox"/>
9	Has the planned route been clearly displayed on the appropriate charts?	<input checked="" type="checkbox"/>
10	Have the requirements regarding traffic separation schemes (TSS), their regulations / vessel traffic routing services (VTS) been considered?	<input checked="" type="checkbox"/>
11	Have important navigational aids of the area to be transited been checked and studied, and has the establishment of a clearing line, position monitoring methods/intervals etc. also been checked and studied, and necessary actions taken?	<input checked="" type="checkbox"/>
12	Has the scope of utilization, etc. of important navigational aids been entered on the marine charts?	<input checked="" type="checkbox"/>
13	Has a safe navigating speed been selected by giving consideration to the weather and sea conditions, traffic density, all known navigational hazards and to the maneuverability of the ship?	<input checked="" type="checkbox"/>
14	Have the needs of the intended voyage, such as fuel, water, lubricants, chemicals, expendable spare parts and tools been studied and considered necessary actions taken? (Ref: Calculations of Consumables, Management Meeting, Toolbox meeting etc.)	<input checked="" type="checkbox"/>
15	Have the vessel's drafts, condition and stability information, the maneuvering characteristics, squat, critical velocity for dragging anchor at the respective stages of the voyage been properly calculated?	<input checked="" type="checkbox"/>
16	Have the tides and tidal currents at the necessary locations of the passage been checked?	<input checked="" type="checkbox"/>
17	Has the necessary information about the arrival port been obtained and studied including pilot boarding area, anchorages etc, including information pertaining to the availability of shore based emergency response arrangements and equipments?	<input checked="" type="checkbox"/>
18	When a pilot is to embark and disembark, has the situation around the pilot station been checked and studied and has the ship handling for it been established?	<input checked="" type="checkbox"/>
19	Are there any local regulations, relevant to the type of vessel or cargo being carried that must be borne in mind? Has necessary action been taken for their compliance?	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
20	Does the plan take into account the marine environment protection measures that may apply to the voyage and avoid, as far as possible, actions and activities which could cause damage to the environment? For e.g., Low Sulphur Fuel consumption in SECA, or, CARB, or, NPDES/VGP, or, restrictions on navigation in certain environmentally sensitive areas like Australian Great Barrier Reef etc.	<input checked="" type="checkbox"/>
21	Has security information regarding pirates and armed robberies likely to be known in the area of intended voyage been studied and considered necessary measures to be taken?	<input checked="" type="checkbox"/>
22	Has a reserve plan / contingency plan been prepared in case the scheduled plan cannot be used?	<input checked="" type="checkbox"/>
23	Other checks, for new or special requirements on Master's discretion	<input checked="" type="checkbox"/>

Second Officer: _____ Master:  Date: 09-06-2017



IMO No.
9312999

DEFINITIVO DE LLAMADA CALL LETTERS
3EPU6

REPUBLICA DE PANAMA
REPUBLIC OF PANAMA
AUTORIDAD MARITIMA DE PANAMA
PANAMA MARITIME AUTHORITY
DIRECCION GENERAL DE MARINA MERCANTE
DIRECTORATE GENERAL OF MERCHANT MARINE
PATENTE REGLAMENTARIA DE NAVEGACION/SERVICIO INTERNACIONAL
STATUTORY CERTIFICATE OF REGISTER/INTERNATIONAL SERVICE

NUMERO OFICIAL OFFICIAL NUMBER
33652-08-A

ORIGINAL - INTERESADO

En cumplimiento de los requisitos estipulados en la Ley 2 de 17 de enero de 1980, aprobados por Resuelto No. 183 de 30 de ENERO de 2012 expedido por esta Oficina SE AUTORIZA Y CONCEDE al buque cuyas características se detallan a continuación, la presente PATENTE REGLAMENTARIA DE NAVEGACION, para todos los fines respectivos que otorga el Registro de la Marina Mercante de la República de Panamá.

In compliance with the requirements established by Law No. 2 dated January 17, 1980, approved through Resolution No. 183 dated, JANUARY 30th, 2012 issued by this Office, the panamanian Merchant Marine Registry, GRANTS AND AUTHORIZES this Statutory Certificate of Register to the vessel whose particulars are described below.

DATOS DE IDENTIFICACION DEL BUQUE
IDENTIFICATION PARTICULARS OF THE VESSEL

NOMBRE DEL BUQUE/ NAME OF THE VESSEL NYK ORION		PROPIETARIO/ OWNER'S NAME ASI SHIPHOLDING I S.A. (100%)	
NOMBRE ANTERIOR/ PREVIOUS NAME NUEVA CONSTRUCCION			
CONSTRUIDO EN/ BUILT IN KURE, JAPON		REPRESENTANTE LEGAL/ NAME OF LEGAL REPRESENTATIVE ARIAS E. Y ASOCIADOS	
CONSTRUCTORES/ BUILDERS IHI MARINE UNITED INC.		AUTORIDAD ENCARGADA DE LAS CUENTAS DE RADIO/ RADIO ACCOUNTING AUTHORITY MOCOS JAPAN CO., LTD.	
AÑO DE CONSTRUCCION/ DATE OF CONSTRUCTION Puesta Quilla/Keel Laying 2007		DIMENSIONES PRINCIPALES/ MAIN MEASUREMENTS TONELAJE/ TONNAGE	
MATERIAL DEL CASCO/ MATERIAL OF HULL ACERO		ESLORA/ LENGTH 123.26 MTS	BRUTO/ GROSS 98,799.00
		MANGA/ BREADTH 45.00 MTS	NETO/ NET 35,550.00
		PUNTAL/ DEPTH 24.40 MTS	
SERVICIO A QUE SE DEDICA EL BUQUE/ KIND OF SERVICE GIVEN BY THE VESSEL			
CARGA SECA/ DRY CARGO *****	CARGA LIQUIDA/ LIQUID CARGO *****	TIPO DE SERVICIO/ TYPE OF SERVICE OTRAS CARGAS/CARGA DE CONTENEDORES	
SISTEMA DE PROPULSION/ PROPULSION SYSTEM			
CLASE Y NUMERO DE MAQUINAS O MOTORES TYPE AND NUMBER OF ENGINES		UN (1) MOTOR(ES) DIESEL	
NUMERO DE CILINDROS NUMBER OF CYLINDERS		DOCE (12) CILINDROS	
MARCA O NOMBRE DE LOS FABRICANTES BRAND OR NAME OF MANUFACTURERS		DIESEL UNITED, LTD.	
VELOCIDAD DEL BUQUE SPEED OF THE VESSEL	25.00	NUDOS KNOTS	CABALLOS DE FUERZA HORSE POWER 88,661 PS

La presente Patente Reglamentaria de Navegación debe ser cancelada y sustituida por otra en los casos que se describen al reverso de este documento.
The present Statutory Certificate of Register should be cancelled and substituted by another one in cases described on the reverse of this document.

EXPEDIDA EN PANAMA EL TREINTA (30) de ENERO de 2012
ISSUED IN PANAMA

FIRMADA Y SELLADA POR EL SUSCRITO DIRECTOR GENERAL DE LA DIRECCION GENERAL DE MARINA MERCANTE O FUNCIONARIO ASIGNADO
SIGNED AND SEALED BY THE UNDERSIGNED GENERAL DIRECTOR OF THE DIRECTORATE GENERAL OF MERCHANT MARINE, OR DESIGNATED PERSON

FECHA DE EXPIRACION VALID UNTIL
DIECISIETE (17) de ABRIL de 2017

DERECHOS: APRIL 17th, 2017
FEES: R.O. 797023 DEL 25/1/2012

REPÚBLICA DE PANAMÁ
DIRECCION GENERAL DE MARINA MERCANTE
ING. ALFONSO CASTILLERO
NOMBRE Y FIRMA
NAME AND SIGNATURE

No. SER-28120



Núm. 8HO-0150TM
No.

CERTIFICADO INTERNACIONAL DE ARQUEO (1969)
INTERNATIONAL TONNAGE CERTIFICATE(1969)

REPUBLICA DE PANAMA

Expendido en virtud de las disposiciones del Convenio Internacional sobre Arqueo de Buques, 1969, en nombre del Gobierno de la República de Panamá para el cual el Convenio entró en vigor el 18 de julio de 1982 por Nippon Kaiji Kyokai.

Issued under the provisions of the International Convention on Tonnage Measurement of Ships, 1969, under the authority of the Government of the Republic of Panama for which the Convention came into force on the 18th day of July, 1982 by Nippon Kaiji Kyokai.

Nombre del buque Name of Ship	Señal distintiva Distinctive Number or Letters	Puerto de matricula Port of Registry	*Fecha *Date
NYK ORION	3EPU6 IMO 9312999	Panama	2007

* Fecha en la que se puso la quilla o en la que el buque estaba en un estado equivalente de adelanto en su construcción (Artículo 2(6)), o fecha en la que el buque sufrió transformaciones o modificaciones importantes (Artículo 3(2) (b)), según proceda.

* Date on which the keel was laid or the ship was at similar stage of construction (Article 2(6)), or date on which the ship underwent alterations or modifications of a major character (Article 3(2)(b)), as appropriate.

DIMENSIONES PRINCIPALES
MAIN DIMENSIONS

Eslora (Artículo 2(8)) Length (Article 2(8))	Manga (Regla 2(3)) Breadth (Regulation 2(3))	Puntal de trazado hasta la cubierta superior en el centro del buque (Regla 2(2)) Moulded Depth amidships to Upper Deck (Regulation 2(2))
323.26 M	45.80 M	24.40 M

LOS ARQUEOS DEL BUQUE SON:
THE TONNAGES OF THE SHIP ARE:

ARQUEO BRUTO
GROSS TONNAGE 98799
ARQUEO NETO
NET TONNAGE 35550

Se certifica que los arqueos de este buque han sido determinados de acuerdo con las disposiciones del Convenio Internacional sobre Arqueo de Buques, 1969.

This is to certify that the tonnages of this ship have been determined in accordance with the provisions of the International Convention on Tonnage Measurement of Ships, 1969.

Expedido en Tokio el
Issued at Tokyo the 13th March, 2008

El infrascrito declara que está debidamente autorizado por el Gobierno arriba mencionado para expedir este certificado.
The undersigned declares that he is duly authorized by the said Government to issue this certificate.



DIRECTORATE GENERAL OF MERCHANT MARINE
SECURAN-PANAMA

Reviewed by: Julio Segura

Date: 12 ABR 2008




Director Administrativo / Managing Director
NIPPON KAIJI KYOKAI ClassNK





NIPPON KAIJI KYOKAI

IMO Number IMO 9312999

CERTIFICATE OF CLASSIFICATION

Classification Number 081552

Ship's Name NYK ORION

Registered Gross Tonnage 98,799

Distinctive Number or Letters 3EPU6

Moulded Dimensions; Length 318.30 m

Breadth 45.80 m

Depth 19.56 m

Owner ASI SHIPHOLDING 1 S.A.

Port of Registry Panama

Flag Panamanian

When Built March 2008

Builders, Where Built IHI Marine United Inc. Kure Shipyard.
Kure, Japan

Main Propulsion Machinery; Description Diesel Engine

Number 1

THIS IS TO CERTIFY THAT the above ship having been surveyed for classification on 13 March 2008 and found to be in compliance with the Society's Rules and Regulations, has been assigned a class and entered in the Classification Register with the undermentioned Classification Character(s).

Classification Character (s): NS* (Container Carrier, Equipped for Carriage of Dangerous Goods)
MNS* (PrimeShip-Direct Assessment & Fatigue Assessment)(PSCM)(IWS)

Descriptive Note (s): (Designed for carriage of vehicles in No.1 to No.6 cargo holds)

This Certificate is valid until 12 March 2018 subject to continued compliance with the Society's Rules and Regulations.

Date of Issue 15 April 2013

NIPPON KAIJI KYOKAI

Place of Issue Tokyo

Executive Vice President



M.V. NYK ORION

NIL LIST

Port of: HAMBURG

DATE: _____

1	ARMS AND AMMUNITIONS	NIL
2	STOWAWAYS	NIL
3	MAILS & PARCELS	NIL
4	PASSENGERS	NIL
5	RADIOACTIVE MATERIALS	NIL



Master of NYK ORION
Capt. Paljetak Pero

PORTS OF CALL LIST

SHIP'S NAME :

NYK ORION

DATE:

FLAG

PANAMA

PORT: HAMBURG

VOY. NO.	PORTS	ARRIVAL	DEPARTURE	REMARKS
Voy. 45E51	Jeddah, Saudi Arabia	14-Jan-17	15-Jan-17	LOADING/DISCHARGING
Voy. 46W51	Singapore, Singapore	3-Jan-17	4-Jan-17	LOADING/DISCHARGING
Voy. 46W51	Vung Tau, Vietnam	1-Jan-17	2-Jan-17	LOADING/DISCHARGING
Voy. 46W51	Hong Kong, China	28-Dec-16	29-Dec-16	LOADING/DISCHARGING
Voy. 46W51	Tokyo, Japan	23-Dec-16	24-Dec-16	LOADING/DISCHARGING
Voy. 46W51	Shimizu, Japan	22-Dec-16	22-Dec-16	LOADING/DISCHARGING
Voy. 46W51	Nagoya, Japan	20-Dec-16	21-Dec-16	LOADING/DISCHARGING
Voy. 46W51	Kobe, Japan	19-Dec-16	20-Dec-16	LOADING/DISCHARGING
Voy. 45E51	Hong Kong, China	14-Dec-16	15-Dec-16	LOADING/DISCHARGING
Voy. 45E51	Singapore, Singapore	9-Dec-16	10-Dec-16	LOADING/DISCHARGING
Voy. 45E51	Suez Canal, Egypt	25-Nov-16	26-Nov-16	TRANSIT
Voy. 45E51	Le Havre, France	16-Nov-16	17-Nov-16	LOADING/DISCHARGING
Voy. 45E51	Southampton, United Kingdom	14-Nov-16	15-Nov-16	LOADING/DISCHARGING
Voy. 45E51	Hamburg, Germany	11-Nov-16	12-Nov-16	LOADING/DISCHARGING
Voy. 45W40	Rotterdam, Netherlands	9-Nov-16	10-Nov-16	LOADING/DISCHARGING
Voy. 45W40	Suez Canal, Egypt	31-Oct-16	1-Nov-16	TRANSIT
Voy. 45W40	Jeddah, Saudi Arabia	29-Oct-16	30-Oct-16	LOADING/DISCHARGING
Voy. 45W40	Singapore, Singapore	19-Oct-16	20-Oct-16	LOADING/DISCHARGING
Voy. 45W40	Vung Tau, Vietnam	16-Oct-16	17-Oct-16	LOADING/DISCHARGING
Voy. 45W40	Hong Kong, China	13-Oct-16	13-Oct-16	LOADING/DISCHARGING
Voy. 45W40	Tokyo, Japan	7-Oct-16	9-Oct-16	LOADING/DISCHARGING
Voy. 45W40	Shimizu, Japan	6-Oct-16	6-Oct-16	LOADING/DISCHARGING
Voy. 45W40	Nagoya, Japan	4-Oct-16	5-Oct-16	LOADING/DISCHARGING
Voy. 45W40	Kobe, Japan	3-Oct-16	4-Oct-16	LOADING/DISCHARGING

Capt. PALJETAK PERO

Master of NYK ORION



GOVERNMENT OF SINGAPORE

No.: 06434

SHIP SANITATION CONTROL EXEMPTION CERTIFICATE / SHIP SANITATION CONTROL CERTIFICATE

Port of SINGAPORE Date: 12 APR 2017

This Certificate records the inspection and 1) exemption from control or 2) control measures applied

Name of ship or inland navigation vessel: NYK ORION Registration/IMO No.: 9312999

At the time of inspection the holds were unladen/laden with PANAMA tonnes of cargo

Name and address of inspecting officer: SANI ESAH NAIN

Ship Sanitation Control Exemption Certificate

Table with 4 columns: Areas, [systems, and services] inspected; Evidence found; Sample results; Documents reviewed. Includes rows for Galley, Pantry, Stores, Hold(s)/cargo, Quarters, crew, officers, passengers, deck, Potable water, Sewage, Ballast tanks, Solid and medical waste, Standing water, Engine room, Medical facilities, and other areas.

Ship Sanitation Control Certificate

Table with 4 columns: Control measures applied; Re-inspection date; Comments regarding conditions found. Includes a 'NOT APPLICABLE' entry.

No evidence found. Ship/vessel is exempted from control measures

Control measures indicated were applied on the date below.

Name and designation of issuing officer: NEOH KIM LENG, Port Health Officer. Signature and seal.



Date: 12 APR 2017

1 (a) Evidence of infection or contamination, including: vectors in all stages of growth; animal reservoirs for vectors; rodents or other species that could carry human disease, microbiological, chemical and other risks to human health; signs of inadequate sanitary measures. (b) Information concerning any human cases (to be included in the Maritime Declaration of Health). 2 Results from samples taken on board. Analysis to be provided to ship's master by most expedient means and, if re-inspection is required, to the next appropriate port of call coinciding with the re-inspection date specified in this certificate. Sanitation Control Exemption Certificates and Sanitation Control Certificates are valid for a maximum of six months, but the validity period may be extended by one month if inspection cannot be carried out at the port and there is no evidence of infection or contamination.



NYK SHIPMANAGEMENT

OWNERS ACCOUNT REPORT

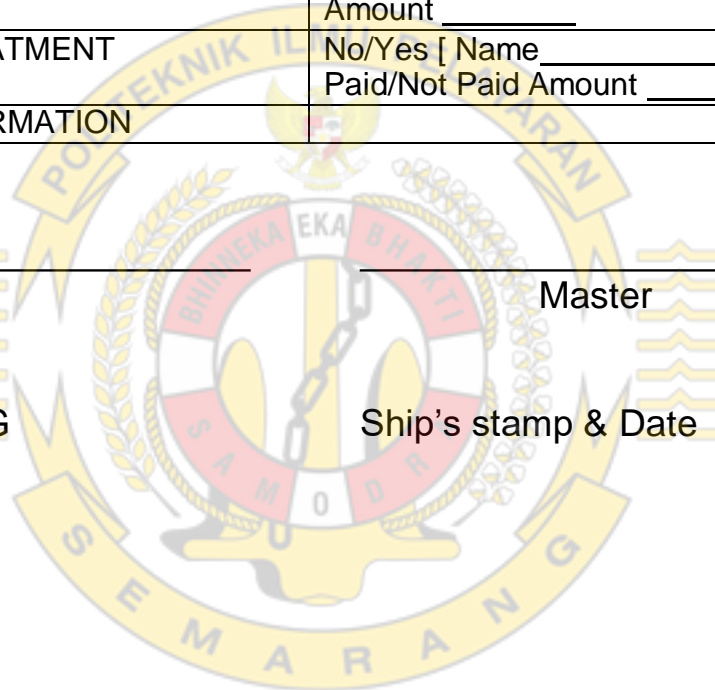
1. WATCH MAN	Not required
2. GARBAGE DISPOSAL	Not required
3. TAXI FOR CREW-Private	Not required
4. SERVICE BOAT for CREW – Private	Not required
5. PRIVATE MAILS	Paid Directly to the Agent
6. OFFICIAL MAILS	No/Yes
7. FRESH WATER SUPPLY	No/Yes [Paid/Not Paid] Amount _____
8. VACCINATION	No/Yes [_____] Persons] Paid/Not Paid Amount _____
9. MEDICAL TREATMENT	No/Yes [Name _____ Paid/Not Paid Amount _____
10. OTHER INFORMATION	

Agent

Master

Port: HAMBURG

Ship's stamp & Date



SHIP'S STORES DECLARATION

1. Name of Ship NYK ORION		X Arrival	Departure
4. Nationality of Ship P A N A M A		2. Port of Arrival HAMBURG	
6. Number of Persons on board 26		5. Port arrived from ROTTERDAM	
7. Expected period of stay ~1 day		8. Place of storage VARIOUS PLACES	
9. Name of article	10. Quantity	11. For official use	
DECK			
Arms and ammunition	NIL		
Mooring Rope	4 Coils		
Wire Rope	2,000 Mtrs.		
Paint	2,405 Ltrs.		
Paint Thinner	216 Ltrs.		
Manila Rope	600 Mtrs.		
STEWARD			
Meat (all kinds)	230 Kg.		
Rice	200 Kg.		
Flour	70 Kg.		
Vegetables	90 Kg.		
Fruits	80 Kg.		
Eggs	76 Dzn.		
Cheese	20 Kg.		
Fish	150 Kg.		
Coffee (500 grams each)	0 Pks		
Coffee (200 grams each)	15 Tins		
Milk	120 Pks		
Sugar	65 Pks		
Salt	70 Kg.		
Spices	30 Kg.		
Tea	15 Bx		
BONDED			
Wine (Red, White)	750 ml/btl	34 btls / 25.5 litres	
Wine (Red/White)	5 L	6 cask / 30 litres	
Beer (24 btl/case ,330 ml each)		41.50 cs / 328.68 litres	
Cigarettes (200 pcs/ctn)		102 ctn / 20400 pcs	
Whisky 1000 ml/btl		NIL btl	
Whisky 700 ml/btl		NIL btl	
Vodka 1000 ml/btl		NIL btl	
CONTROLLED DRUGS UNDER MASTER'S CARE			
AS PER ATTACHED LIST			
12. Date and Signature by Master. Authorized Agent or Officer			
16-Jan-2016		MASTER:	CAPT. PALJETAK PERO



VACCINATION LIST

1.1 Name and type of ship M/V NYK ORION		CONTAINER	2. Port of arrival/departure SUEZ CANAL		3. Date of arrival/departure 19-Oct-17 20-Nov-17		
1.2 IMO number 9312999							
1.3 Call sign 3EPU6							
4. Flag state of ship PANAMA				5. Last port of call COLOMBO			
SL. NO.	NAME OF THE CREW MEMBER	NATIONALITY	RANK	ISSUED DATE	EXPIRY DATE		
1	PALJETAK, PERO	CROATIAN	MASTER	24-Apr-08	UNLIMITED		
2	RAHMAN, MATIUR	BANGLADESHI	C/M	29-May-15	UNLIMITED		
3	GUELOS, RITCHE LEONIDA	FILIPINO	2/M	26-Aug-08	UNLIMITED		
4	BALUYOT, KEIZER CESUMICION	FILIPINO	3/M	23-Feb-14	UNLIMITED		
5	ROY, KANISKA	INDIAN	C/E	3-Apr-17	3-Apr-27		
6	BARTULOVIC, SINISA	CROATIAN	1/E	25-May-07	UNLIMITED		
7	WIN, ZIN KO KO	MYANMAR	2/E	19-Nov-12	18-Nov-22		
8	OBMERGA, DYLAN ELI FERRER	FILIPINO	3/E	26-Mar-15	UNLIMITED		
9	ESPIRITU, MON EDUARD DIONEDA	FILIPINO	ELECT.	28-May-11	UNLIMITED		
10	NUAL, JERSON GLICO	FILIPINO	HELPER ELECT.	27-Jul-17	UNLIMITED		
11	REYES, ADELITO DUBLIN	FILIPINO	BOSUN	6-Jun-11	UNLIMITED		
12	CARANDO, ALAN BANARIA	FILIPINO	AB-A	8-Jan-08	UNLIMITED		
13	CAJUTOL, JAY DURAN	FILIPINO	AB-B	21-May-09	UNLIMITED		
14	CLENISTA, LOFREDAN RYAN CUBERO	FILIPINO	AB-C	5-Aug-13	UNLIMITED		
15	BAYUDAN, REY EJE	FILIPINO	OS-A	21-Nov-13	UNLIMITED		
16	BERNALES, JASON AMOR SUYAT	FILIPINO	OS-B	17-Jul-14	UNLIMITED		
17	BATILARAN, STEPHEN SOURIBIO	FILIPINO	OILER-1	6-May-15	UNLIMITED		
18	DIENTE, RODOLFO SUGANOB	FILIPINO	OILER-A	15-Apr-16	UNLIMITED		
19	LAS PINAS, RENATO MONTEDERAMOS	FILIPINO	OILER-B	18-Apr-13	UNLIMITED		
20	MANGGANA, ROMIEDEL ARRABIS	FILIPINO	WIPER	24-Aug-15	UNLIMITED		
21	PENALOSA, RIZALDY MENDOZA	FILIPINO	CHIEF COOK	25-Dec-14	UNLIMITED		
22	BAGACINA, RUJEL MONGE	FILIPINO	2ND COOK	9-Oct-08	UNLIMITED		
23	CABESAS, RAYMOND GONZALES	FILIPINO	MESSMAN	24-Jan-13	UNLIMITED		
24	OO, MIN	MYANMAR	DECK CADET-A	17-Aug-16	UNLIMITED		
25	PRATAMA, SETYANGGA NUR	INDONESIA	DECK CADET-B	10-Aug-16	9-Aug-26		
26	KOMARADIA, ANDIKA ADI NUR	INDONESIA	ENGINE CADET	10-Aug-16	9-Aug-26		
12. Date and signature by master or officer							
Signed CAPT. PALJETAK, PERO				Date : 19-Oct-17			

Port Of Hamburg on 6 JUn. 2017

To: Hamburg Port Authority
From: Master of M/V "NYK ORION "

I, the under signed master of M/V "NYK ORION", hereby declare that there is no Arms/Ammunition or self-defense weapons on my vessel during her berth Port of Hamburg on



Master of M/V "NYK
ORION"
Signature/Stamp

Trim and Stability Summary

Metric Units

Portcall: 30-RTM-E

Tankage: Arrival HAM

Containers

	Weight	VCG	LCG	TCG	Vert. Moment	Long. Moment	Trans. Moment	Trans. Moment
Below Deck	38239.4	13.31	7.50	0.19	508841	286788	7292	
Above Deck	19822.9	33.33	-5.14	0.34	660744	-101908	6796	
TOTAL	58062.3	20.14	3.18	0.24	1169585	184880	14088	

Tankage

	Weight	VCG	LCG	TCG	Vert. Moment	Long. Moment	Trans. Moment	Free Surface Moment
SW Ballast	5937.0	12.71	18.58	-2.84	75447	110329	-16849	8720
Fuel Oil	4334.0	3.76	-5.94	-0.08	16291	-25736	-354	46424
Diesel Oil	192.0	10.92	-85.24	-15.77	2097	-16367	-3028	230
Lube Oil	497.0	13.75	-89.01	13.40	6836	-44236	6662	294
Fresh Water	590.0	14.09	-64.72	-1.10	8311	-38185	-649	32
Misc. Tanks	115.0	4.68	-97.15	1.78	538	-11172	205	766
TOTAL	11665.0	9.39	-2.17	-1.20	109521	-25366	-14012	56466

Extra Weights

	Weight	VCG	LCG	TCG	Vert. Moment	Long. Moment	Trans. Moment	Free Surface Moment
Crew & Effects	4.2	38.88	-74.54	0.00	163	-313	0	0
Provisions	6.3	29.40	-79.34	0.00	185	-500	0	0
Stores Fwd	51.5	26.00	154.14	0.00	1339	7938	0	0
Stores E/R	113.3	15.96	-90.54	0.00	1808	-10258	0	0
Stores Aft	41.2	18.55	-160.05	0.00	764	-6594	0	0
Oil & Water In E	54.3	11.02	-93.39	0.00	598	-5071	0	0
Cntr. Loose Fitt	44.1	12.71	32.53	0.00	561	1435	0	0
TOTAL	314.9	17.21	-42.44	0.00	5419	-13363	0	0

Weight Totals

	Weight	VCG	LCG	TCG	Vert. Moment	Long. Moment	Trans. Moment	Free Surface Moment
Deadweight	70042.2	18.34	2.09	0.00	1284524	146151	76	56466
Lightship	35473.0	15.54	-20.71	0.00	551251	-734470	0	0
TOTAL	105515.2	17.40	-5.58	0.00	1835775	-588319	76	56466

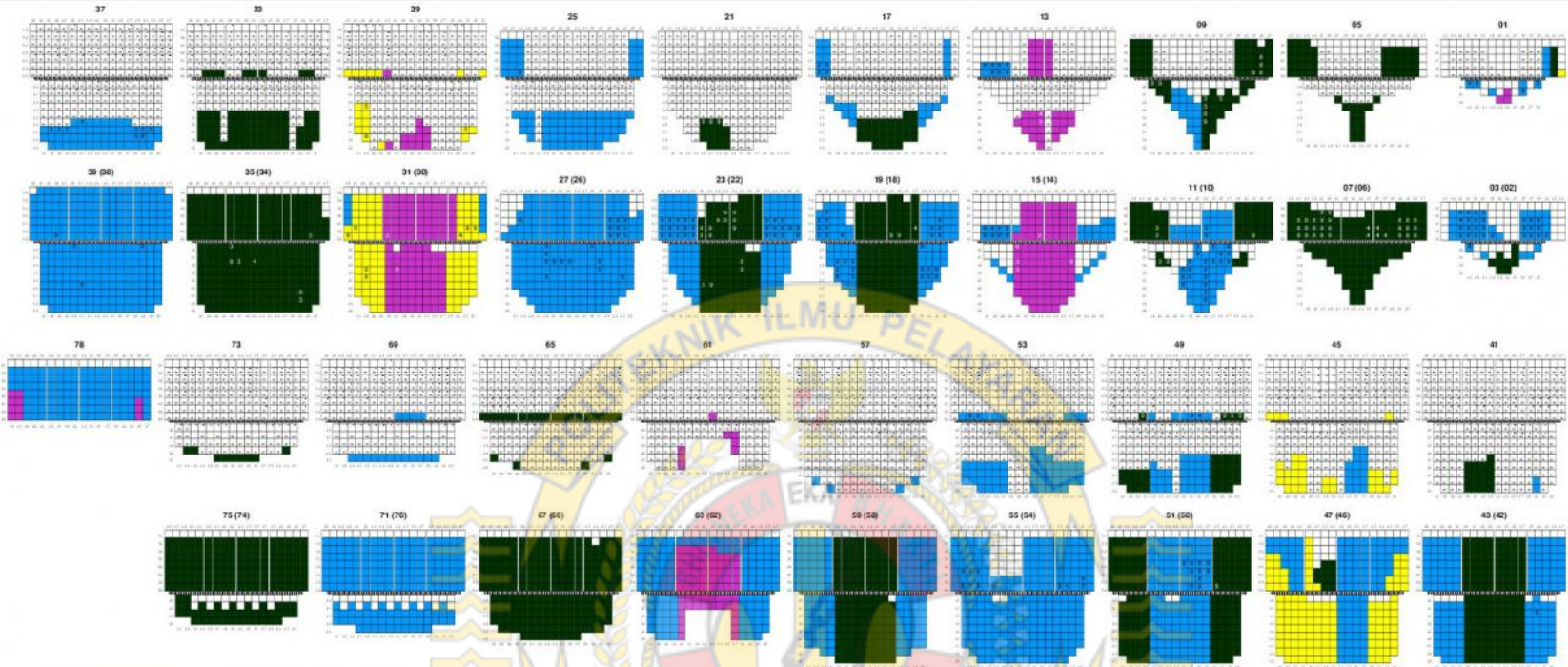
Stability Condition

----- Trim -----

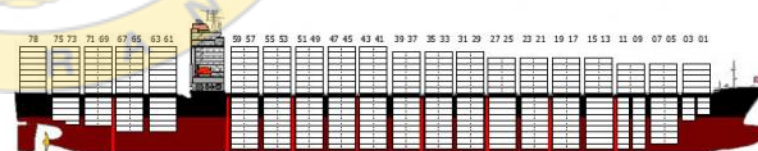
----- Stability -----

----- Strength -----

Water Density	1.000 mt/m ³	KM	22.41 m	Maximum Shear	73%
Draft @ FP	11.90 m	KG solid	17.40 m	Maximum Bending (Hog)	77%
Draft @ MS	11.98 m	Free Surface Correction	0.54 m	Maximum Torsion	68%
Draft @ AP	12.07 m	KG Corrected	17.93 m		
Mean Draft	11.99 m	GM Corrected	4.48 m		
Trim (by stern)	0.17 m	GM Required	0.80 m		
List	No List	GM Margin	3.68 m		
Draft @ Fwd Marks	11.91 m				
Draft @ Load Line	11.98 m				
Draft @ Aft Marks	12.06 m				



	HAM	LEH	RTM	SOU	TOTALS	
20' EMPTY		11	11		22	1583
20' FULL	645	96	693	127	1561	
40' EMPTY		33			33	3146
40' FULL	1124	153	1599	237	3113	
45' FULL	1		32	2	35	35
TOTALS	1770	293	2335	366		4764



NYK ORION

BRIDGE NOTEBOOK

ADDITIONAL INFORMATION

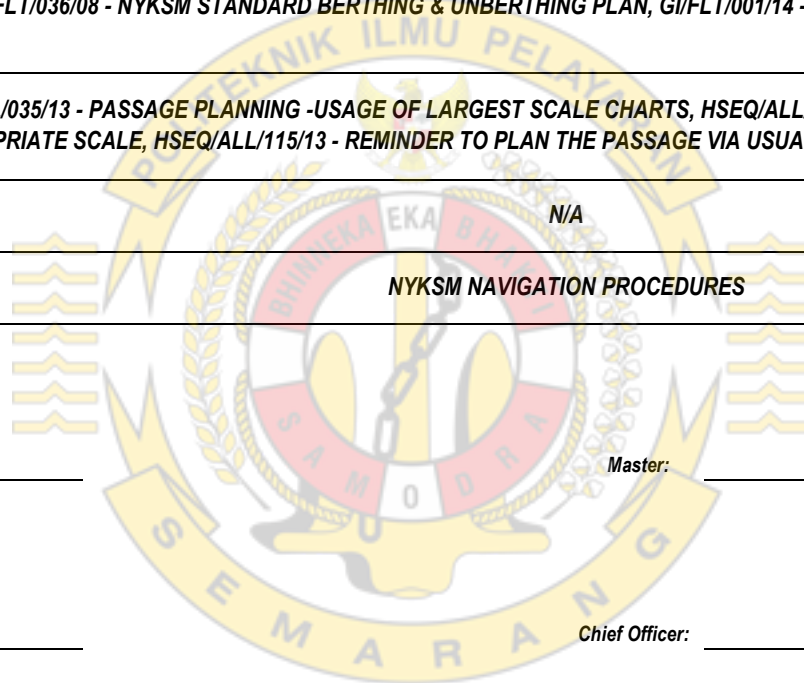
Ship's Data	Estimated Max Departure Draft: 13.00m, Departure Displacemanet:106949mt, Departure GM:
UKC Calculation	UKC Calculation is base on (Depth on the chart + Height of tide at LW) - (Estimated max.draft + Squat at manoeuvring speed)
Reference GI/FLT Letters	GI/FLT/036/08 - NYKSM STANDARD BERTHING & UNBERTHING PLAN, GI/FLT/001/14 - NYKSM MANOEUVRING STANDARD
Reference HSEQ/ALL Letters	HSEQ/ALL/035/13 - PASSAGE PLANNING -USAGE OF LARGEST SCALE CHARTS, HSEQ/ALL/041/13 - USE OF NAUTICAL CHARTS WITH APPROPRIATE SCALE, HSEQ/ALL/115/13 - REMINDER TO PLAN THE PASSAGE VIA USUAL, CUSTOMARY & REASONABLE ROUTE.
Reference HSEQ/SEC Letters	N/A
Reference	NYKSM NAVIGATION PROCEDURES

Second Officer: _____

Master: _____

Third officer: _____

Chief Officer: _____



BRIDGE NOTEBOOK

<S-074102-05 FRM > REV. 2011-02-28

The number of Notice to Mariner up to which the Charts are checked for permanent and T&P corrections	NTM WK - 46 / 2015
Charts used	BA 207;BA122; BA1630; BA1631; BA1633; BA1635;BA1875, BA3617; BA3619; BA3625; BA3267; BA3268; INFO CHARTS: BA5500; BA2182A; BA2675;
Publications Reffered	ALRS VOL. 1(1) (NP 281(1)); ALRS VOL. 2 (NP 282); ALRS VOL. 3(1) (NP 283(1)); ALRS VOL. 4 (NP 284); ALRS VOL. 5 (NP 285); ALRS VOL. 6(1) (NP 286(1)); ALRS VOL. 6(3) (NP 286(3)); ALL VOL.A; ALL VOL.B; NP 27-CHANNEL PILOT; NP 55-NORTH SEA EAST PILOT; NP 28-DOVER STRAIT PILOT;
Route and weather information	GUIDE TO PORT ENTRY; MARINERS HANDBOOK NP 100; WEATHER FACSIMILE (OFFENBACH); BRIDGE WEATHER PROGRAM;; Navigational Warnings and Weather Warning received by Inmarsat -C (Navarea 1) , Navtex(P & S)
Any instruction from office related to passage	SMS CHAPTERS: 074002, 074003, 074004;
Tidal Prediction	ADMIRALTY TIDE TABLES VOL. 1 & 2; ATSA-NORTH SEA S PART (NP251); ATSA-NORTH SEA E PART (NP253);
Necessary information regarding arrival port and passage	PAY ATTENTION TO FISHING BOATS, PLEASURE BOATS, CROSSING VESSELS, FERRIES AND SHALLOW WATERS;
Information related to Reporting	Call Elbe Pilots VHF Ch. 08/09/16;Call German Bight Traffic VHF Ch. 80; Call Cuxhaven Elbe Traffic VHF Ch. 71;
Noteworthy incidents and evaluation of the voyage (to be filled up after completion of the voyage)	

Second Officer: _____

Master: _____

Third officer: _____

Chief Officer: _____



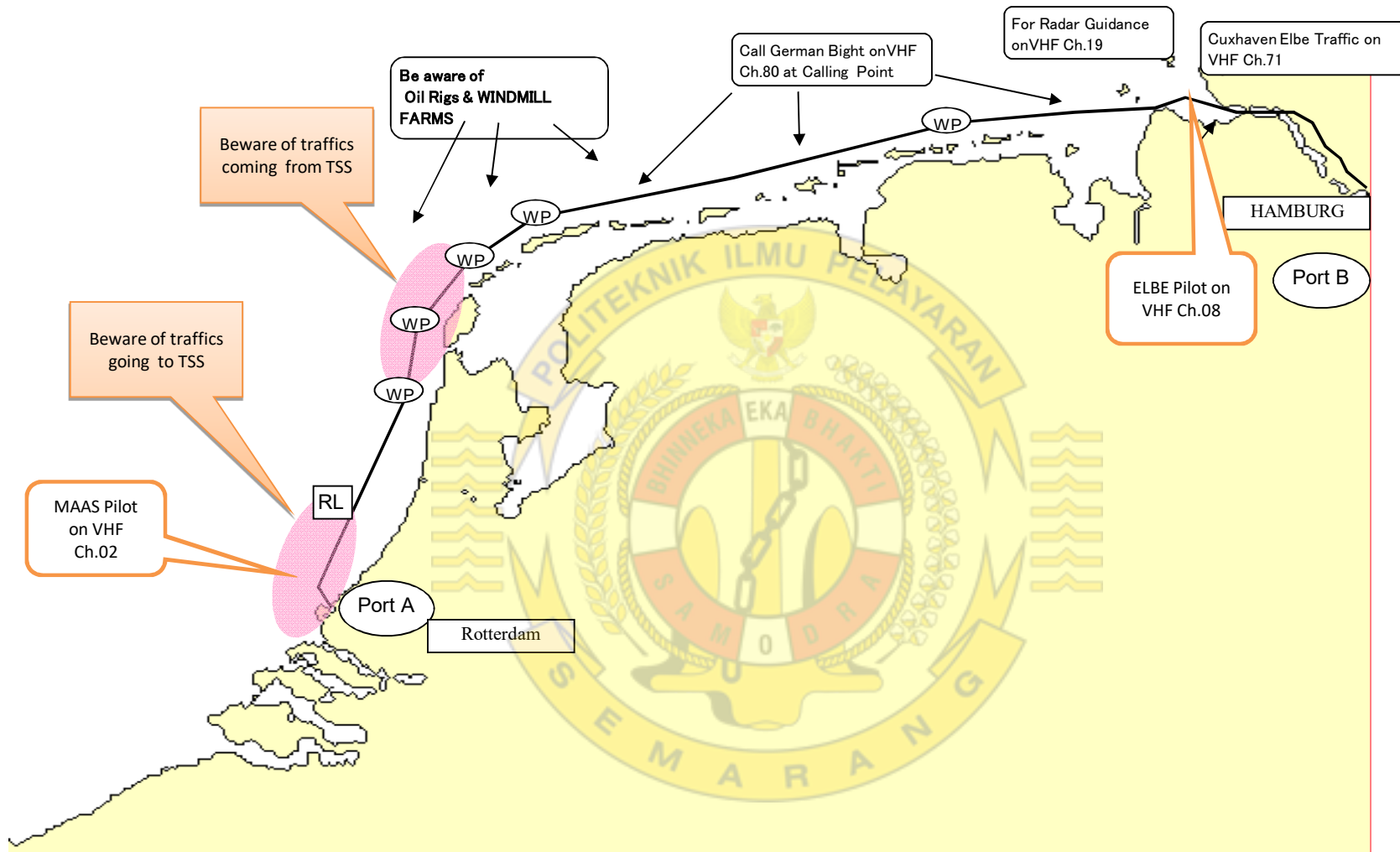
PASSAGE PLAN MAP (GENERAL CONCEPT of NAVIGATION)

From : Rotterdam

To : Hamburg

Voy. : 42 E 12

Date : 26-Mar-15





PILOT CARD and MASTER-PILOT INFORMATION EXCHANGE

Port : _____ Date : _____ Pilot's Name : _____

PART A : SHIP'S PARTICULARS (fixed/permanent data)

Ship's name M/V NYK VEGA IMO No. 9312781
 Call sign 3EIJ5 LOA 338.17 Breadth 45.60m Year built 2006
 GRT 97,825 M/T Deadweight 103,310 M/T Summer Displ. 120,302 M/T
 Anchor chain: Port 14 shackles, Stbd 14 shackles, Stern _____ shackles (1 Shackle= 27.5 m / 15 fathoms)
 Distance Bridge: to bow 245.65 m, to stern 92.52 m Bulbous bow: YES / ~~NO~~
 Thruster : Bow 2000 kw (2719 HP), Stern _____ kw (_____ HP)
 Rudder Type BALANCE, Max. angle 35, Number of rudders 1, Hard-over to hard-over 28 sec
 Rudder angle for neutral effect N/A Type of Steering Gear : YDFT 870-4 Electro-Hydraulic
 Steering idiosyncrasies / peculiarities (if any): N/A
 Number of Propellers 1 Propeller Turn : RIGHT / ~~LEFT~~, Controllable Pitch : ~~YES~~ / NO
 Type of engine DIESEL(HYUDAI B & W) Maximum power 64033kw (87060HP)

Maneuvering Engine order	Rpm/pitch	Speed Loaded	Speed Ballast
Full ahead	46	12.0	12.9
Half ahead	39	10.0	11.1
Slow ahead	31	8.0	9.4
Dead slow ahead	25	6.0	7.8
Dead slow astern	25	a. Time limit for ME to run continuously astern <u>N/A</u> min	
Slow astern	31	b. Time taken: Full ahead to full astern <u>25</u> sec	
Half astern	39	c. Max. no. of consecutive starts <u>18</u> times	
Full astern	46	d. Minimum RPM <u>25</u> , <u>6</u> knots	
		e. Critical RPM : From <u>56</u> to <u>65</u>	
		f. Astern power <u>100</u> % of ahead power	

h. Any Constraints imposed by Fuel type in use:
NONE
g. Type of Fuel in use for M/E propulsion HFO
 (Eg. HFO/DO/MGO/ULSGO etc)

(Obtain items 'a' to 'e' from sea trial booklet, item 'f' for diesel engines may be estimated by experience and 'rule of thumb')

PART B - 1 : SHIP'S CONDITION: (voyage-specific data, to be filled-in for each maneuver)

Diagram labels: 338.17, 245.65m, 45.6 m, 2016-01-26-1900_9312781.zip, Center of manifold, Air Draught, 65.190m, *61.92m when MF/HF antenna down, Parallel W/L Loaded Ballast, (Required for oil & gas tankers only), List ___ deg Port / Starb'd

Draught: Fwd ___ m/___ ft___ in, Aft: ___ m/___ ft___ in Mid-Ship: ___ m / ___ ft___ in,
 Displacement : _____ M/T

PART B - 2 : SHIP'S READINESS : (voyage-specific data, to be filled-in for each maneuver)

Check and Confirm following tested and in readiness and in good working order as applicable:

Anchors, Windlass, Winch	<input type="checkbox"/>	Steering gear	<input type="checkbox"/>	Number of power units operating	<input type="checkbox"/>
Whistle	<input type="checkbox"/>	ECDIS # 1	<input type="checkbox"/>	ECDIS # 2	<input type="checkbox"/>
Radar / ARPA #1 _____ cm	<input type="checkbox"/>	Indicators : Rudder	<input type="checkbox"/>	ME Rpm/Pitch	<input type="checkbox"/>
Radar / ARPA #2 _____ cm	<input type="checkbox"/>	Bow Thruster (s)	<input type="checkbox"/>	Rate of Turn	<input type="checkbox"/>
Radar / ARPA #3 _____ cm	<input type="checkbox"/>	Speed log	<input type="checkbox"/>	Flags, Day signal Lamp, Shapes	<input type="checkbox"/>
VHF's	<input type="checkbox"/>	Water speed	<input type="checkbox"/>	Doppler	<input type="checkbox"/>
M/E run ahead / astern	<input type="checkbox"/>	Dual-Axis	<input type="checkbox"/>	Ground speed	<input type="checkbox"/>
Engine Telegraphs	<input type="checkbox"/>	Compass System	<input type="checkbox"/>	Echo sounder	<input type="checkbox"/>
Elec. Pos. Fix. Sys. Type: _____		*Constant Gyro Error _____			

** AIS **AIS power output: (Arrival in port limits = Reduce) / (Departure from port limits = Increase)
 *(Gyro Error)=(Gyro Bearing)-(True Bearing)<Ex: Gyro 240° True 242° : Gyro Error -2° >

Pilot Card

The Company defines the navigational equipment that the pilot can use as follows:

- a).RADAR/ARPA No.: _____ . b) ECDIS No. _____ c). VHF No. _____ d). AIS _____ e) Air Horn _____
 f). Others : _____.

PART C: Local conditions and special information (voyage-specific data, to be filled-in for each maneuver)

Vessels must attempt to obtain as much of the following data as is possible; by discussion with the Pilot.

However, **it is understood that traffic & maneuvering situations and time in hand may not always allow a complete review.**
 Therefore the extent of information recorded in this part is at the Master's discretion, as best suitable to the prevailing circumstances.

Weather: Actual condition (Berthing and Un-berthing criteria)

- (1) Wind: _____ m/s (\leq _____ m/s) (2) Current: _____ kt (\leq _____ kt)
 (3) Sea & Swell: _____ m (\leq _____ m) (4) Visibility: _____ n.m. (> _____ n.m.)
 (5) Changes in the effect of (1) & (2) on the vessel, when ever courses are altered, with special emphasis to cross-track drift of the vessel.

Check condition for safe berthing/un-berthing

- All conditions are within the criteria for berthing/un-berthing to/from the terminal
 Not all conditions are within the criteria, however, all parties concerned have acknowledged to proceed for approach to berthing/un-berthing on condition that _____

Approach plan & Berthing/mooring/anchoring layout; Tugs, mooring boats to be used; cautionary positions where special care may be required (sketch if possible or attach Pilot's sketch if provided):

Approach Speed		Lateral Berthing Speed	
RANGE	PCC/CNTR	RANGE	PCC/CNTR
3.0 nm	-	200 mtr	-
1.0 nm	6 kts	100 mtr	20-30 cm/s
0.5 nm	4 kts	60 mtr	15 cm/s
1 Length	2 kts	30 mtr	10 cm/s
		Final Appr	8 cm/s

(1) Berthing Speed: \leq _____ cm/sec.
 (2) Tug arrangement: Berthing / Un-berthing _____ ps x _____
(3) Location of Tug Push Point : BAYS:61,57,37,25 (PORT AND STARBOARD)

Others:

- Contingency Plan** by Vessel and Pilot, in case of **FAILURE** of M/E, Bow Thruster and Steering.

 CALL FOR ANOTHER TUG IN CASE OF FAILURE OF M/E, B/T & STEERING BOTH ANCHORS STANDBY AND LETTING GO.
- Special limitations or malfunctions of relevant equipment/machinery (if any other than below SWLs):
 S.W.L. of mooring bitts = 52T, S.W.L. of sunken (recessed) bitts = _____T, S.W.L. of bitts for S.T.S. = _____T
 Maximum permissible bollard pull of Tugs _____

 SWL of Fairleads: _____ 82 SWL of Bitts: _____ 52
 New local hazards, reporting regulations etc.:

Part D (Applicable to all vessels)

The effect of Squat, available UKC and maximum allowable speed to maintain company UKC policy shall be discussed and confirmed with pilot.

Squat and UKC information

Speed (in knots)									
Squat (Sinkage) in Metres									
Draft Fwd in Metres (After effect of Squat)¹									
Draft Aft in Metres (After effect of Squat)¹									

1: Squat shall always be added to fwd and aft draft

Company Policy on UKC	Required Static UKC to meet Company Policy.	Vessel Minimum Static UKC.	Maximum allowable Speed to maintain Dynamic UKC	Remark
(1) Coastal Passages – 15% of the deepest draft + Sinkage due effect of squat at prevailing speed				
(2) Channels inside ports – a) 10% of the deepest draft (See Note 2) Or b) 0.60 m + Sinkage due to effect of Squat at speed to be maintained + 0.5 m allowance for accuracy of chart and depth (if applicable)				
(3) Fairway or Channels outside ports (leading to ports) and during river passages – a) 15% of the deepest draft (See Note 2) Or b) 0.60 M + Sinkage due to effect of Squat at speed to be maintained + 0.5m allowance for accuracy of chart (if applicable) + 0.5m allowance for wave motion (if applicable).				
(4) Canal transit – As per local navigational rules. If none, then as per “(2) Channels inside ports” above.				
(5) Moored Alongside – 0.60 m + Sinkage due to effect of squat caused by prevailing current + swell				

Note 1: For all of the above Company Policy on UKC, following should be noted:-
Additional appropriate allowance shall be made by considering reduction in UKC due to heeling of vessel during alteration of course(s), rolling / pitching, weather and other applicable factors as listed in ZZ-S-P-07.41.03 paragraph 6.5.

Note 2: The maximum speed shall be limited so as minimum 0.60 m of net UKC is maintained at all times after deducting the sinkage due to squat, and accuracy of the chart (Zone of Confidence and other factors).

Note 3: Wherever the word “Or” is mentioned in the above table, the vessel should maintain the higher of the two calculated UKC options.

Note 4: Risk assessment should be initiated and Company approval sought as per SMS ZZ-S-P-07.41.03, sec 4, Table 1 (Threshold for submitting RA to the Company (related to UKC Policy)).

Master _____ D/O _____ (Pilot – optional) _____

ECDIS FAILURE / MALFUNCTION

10. ECDIS Failure / Malfunction

10.1 Abnormality or Malfunction of ECDIS

The Officer on watch, when an abnormality occurs in the ECDIS, must immediately take the following measures:

- a) If steering with auto track control, switch to manual steering.
- b) Switch to other ECDIS.
- c) Report to Master
- d) Ascertain navigation condition of own vessel.
- e) Confirm operation and integrity of second ECDIS. If on RCDS mode, continue navigation using paper charts.
- f) Ascertain navigation condition of own vessel (traffic, position, proximity of navigational hazard etc.).

10.2 One ECDIS Failure

When an ECDIS fails, must immediately take the following measures:

- a) OOW must take measures as per above paragraph 10.1 for abnormality or Malfunction of ECDIS.
- b) OOW must Notify the Chief Engineer or the Engineer on watch (Engineer on UMS duty).
- c) Master must notify the Company.
- d) A joint risk assessment with the company shall be carried out for navigating with one ECDIS.
- e) ECDIS repair shall be arranged at the earliest.

10.3 Both ECDIS Failure

The Officer on watch, when both ECDIS fails, must immediately take the following measures:

- a) If steering with auto track control, switch to manual steering.
- b) Switch on all steering systems.
- c) Notify the Chief Engineer or the Engineer on watch (Engineer on UMS duty).
- d) Notify the Master.
- e) Have main engine on S/B.
- f) Ascertain navigation condition of own vessel (traffic, position, proximity of navigational hazard etc.).
- g) If updated paper charts available navigate using paper charts.
- h) Stop movement of ship, as occasion demand, by stopping or reversing main engine.
- j) Send attention drawing signals to surrounding ships.
- k) Transmit Safety or Urgency Communication by means of VHF Ch.16 as occasion demands.
- m) Record the time of the occurrence of the failure and the ship's position

10.4 Impact on ECDIS due to Other Emergencies

In case failure of ECDIS is due to other machinery troubles e.g. Black out will result in ECDIS functioning properly for certain period of time till back up power is available.

Bridge Team members should make best use the resources to ensure ECDIS are available for maximum period and following should be considered as

ECDIS FAILURE / MALFUNCTION

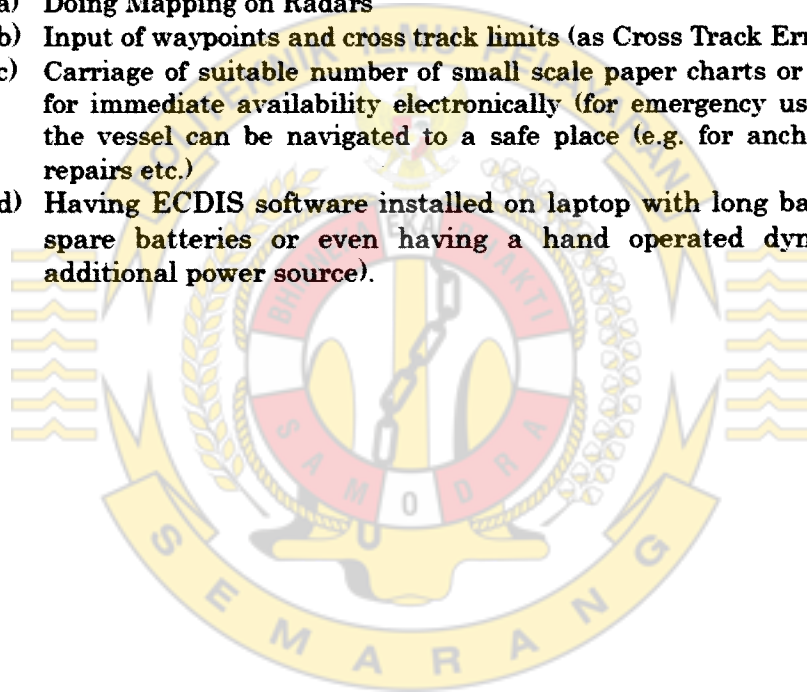
appropriate to the circumstances in consultation with the company:

- a) Inter switching one ECDIS on UPS and keeping the other OFF / Standby and then switching over to the other ECDIS subsequently
- b) Taking snapshots of ENC's (and printing out) for reference in case needed later.
- c) Obtaining scanned copies of charts for immediate use from the company.
- d) Appropriate measures from paragraph 10.5 below depending in the impact on ECDIS due to another emergency.

10.5 Risk Reduction Measures

In order to respond to ECDIS failures or malfunctions. Masters and companies should be guided by one or more of the following to avoid any immediate impact to the safe navigation in case of sudden ECDIS abnormalities, malfunctions or failures:

- a) Doing Mapping on Radars
- b) Input of waypoints and cross track limits (as Cross Track Error) in GPS
- c) Carriage of suitable number of small scale paper charts or has arrangement for immediate availability electronically (for emergency use only) such that the vessel can be navigated to a safe place (e.g. for anchoring / arranging repairs etc.)
- d) Having ECDIS software installed on laptop with long battery life (and/or spare batteries or even having a hand operated dynamo serving as additional power source).



RISK MANAGEMENT

11. Risk Management

11.1 Transition to ECDIS

The introduction of ECDIS should be considered as a "Management of Change" process for ensuring a robust system is in place for this transition.

The management of change may include various aspects from hardware selection, installation plan, ship staff training planning and revisions to Company's SMS and/or related Navigation Procedures. The changes in procedures should include, but not be limited to, the following:

- Navigation using ECDIS
- Passage planning
- Updating and supplying ENC/updates.
- Contingency Planning in event of ECDIS Failure / impact of other emergencies on ECDIS
- Pre departure / arrival, Pilotage, Confined Waters, Open Seas related usage
- ECDIS trained personnel
- Auditing and Verification of Effectiveness

11.2 Risk Assessment – Transition to ECDIS

Risk Assessments are recommended to be done for recognition of potential hazards in migrating from paper to ECDIS navigation and facilitate in removing these hazards. Some factors such as impact on navigation practices, training including availability / planning of having adequately and suitable number of trained staff for respective vessels, hardware matters, type specific limitations, coverage of chart data, complexity of integrating charts from multiple sources, flag and port state control requirements etc. should be considered.

11.3 Risk Assessment – ECDIS Use

In development of procedures and practices for navigation using ECDIS, risk assessment methodology assists in identifying the hazards related to Navigation using ECDIS including usage of ENC and RNC. This will also assist in:

- development of operational procedures:
- important matters for training and familiarization:
- type specific matters (related to equipment fitted on respective vessels):
- the selection of the optimum level of paper charts needed to compliment the electronic chart system, for operation in the RDCS mode:
- contingency measures
- over reliance on ECDIS (ref paragraph 3.4.1)
- limitations of RCDS (ref paragraph 3.4.2)

The risk assessment shall include, but need not be limited to, the assessment of the following hazards:

- a) Next chart unavailable
- b) Lack of anticipation of approaching and developing navigation hazards
- c) Vessel may enter designated danger areas
- d) Vessel position may shift between chart margins
- e) Loss of navigation data
- f) Navigation information not readily available

RISK MANAGEMENT

- g) Accuracy of the chart may differ from accuracy of the position fixing system in use
- h) Hardware failure
- i) Software failure
- j) Failure to up date charts
- k) Input failure – position
- l) Input failure – course and speed
- m) Virus infection
- n) Total ECDIS failure
- o) Power failure

The risk assessment could also be used to determine the minimum number of paper charts required to be carried so that, in the event of a total ECDIS failure, the ship will be able to safely navigate to a pilot station or position where a technician could board or charts could be delivered on board to enable the ship to enter port safely. This assessment may be made by the Company if the ship is on a regular trade, or, for vessels trading world wide, by the master as part of voyage / passage plans.

“NYK STANDARD FOR NAVIGATION USING ECDIS” has been developed as a result of Risk Management of ‘Transition to ECDIS’ and ‘Use of ECDIS’.

This standard also provides valuable information to companies and ship’s staff for Risk Assessment and Development of Procedures and Navigation Practices for management of these risks.

**NYK Standard for Navigation using ECDIS
ECDIS Watch Checklist**

<Appendix-4>

Vessel	Voy No.	(Port) From	To (Port)				Remarks
SECTION A: Settings (To be instructed by Master)							
1) Safety Depth Setting							
2) Safety Contour Setting							
3) Look Ahead Monitoring Zone (or Grounding alarm Monitoring Zone) instruction :							
Date:							
SECTION B: Check items prior taking over watch							
	0000	0400	0800	1200	1600	2000	Remarks
1) Settings							
a) Is Date and time set on ECDIS accurate?							
b) Datum							
c) Being used in RCDS or ECDIS mode?							
d) Any change in settings of ECDIS?							
e) Route plan loaded and monitored on both ECDIS?							
f) Safety Depth setting (as per Section A-1)							
g) Safety contour setting (as per Section A-2)							
h) Look ahead function as per Section A-3?							
i) Draft and Pilot (static data - ship's particulars) correctly entered?							
j) Turn rate & radius of turn entered is appropriate?							
k) Cross track limit set as per area and Master's orders?							
2) Alarms & Indicators							
a) Are alarms settings as per mandatory req?							
b) Are indicator settings as per mandatory req?							
c) Are additional alarm / indicator settings as per Master's instructions?							
3) SENC Display & Charts							
a) All information in Standard Base selected?							
b) Are spot sounding selected for display?							
c) Is, if any, essential information to be displayed as per Master's instructions selected for display?							
d) Is Nominal Scale of chart being used? (No overscale / underscale/ SCAMIN)							
e) Updated ENC / RNC in use?							
4) SENSORS							
a) Confirm from handing over OOW about status of input of sensors including which are active?							
b) No speed and heading input errors?							
c) Compare radar and ECDIS(GPS) positions							
d) Compare ARPA and AIS data shown on ECDIS?							
e) Voyage Recording is in progress?							
5) Additional Checks if in RCDS Mode							
a) Paper charts being used as backup?							
b) Alarms for officer entered information active?							
c) Chart Datum and datum setting on ECDIS confirmed and datum shift applied, if required?							
6) Are all above checks confirmed on both ECDIS?							
7) Additional ship / equipment specific checks							
OOW Watch Signature:							
Master's Signature							

Note:

- a) All checks should be carried out on both ECDIS.
- b) Self Diagnostic and similar tests/checks should be included and carried out as per vessel specific Bridge / Navigation Equipment Checklist



NYK Standard for Navigation Using ECDIS

ECDIS Display Configuration and Quick Checkpoints - 2

Overlays

Check that all overlays are visible and correct. Check that the display is set to the correct mode.

- 2D/3D View
- All Chart Symbols
- All Chart Symbols
- All Chart Symbols

Route & Limiting Danger Line Display Setup

Check that the route and danger line are displayed correctly.

- Route Line Color
- Route Line Width
- Route Line Style
- Route Line Color
- Route Line Width
- Route Line Style

Main Chart Panel

Check that the main chart panel is displayed correctly.

- Chart Area
- Chart Area
- Chart Area
- Chart Area
- Chart Area
- Chart Area

Own Ship Setup

Check that the own ship is displayed correctly.

- Own Ship Symbol
- Own Ship Symbol
- Own Ship Symbol
- Own Ship Symbol
- Own Ship Symbol
- Own Ship Symbol

Route

Check that the route is displayed correctly.

- Route Line Color
- Route Line Width
- Route Line Style
- Route Line Color
- Route Line Width
- Route Line Style

Route & Limiting Danger Lines

Check that the route and danger lines are displayed correctly.

- Route Line Color
- Route Line Width
- Route Line Style
- Route Line Color
- Route Line Width
- Route Line Style

Waypoint Selection

Check that the waypoint selection is displayed correctly.

- Waypoint Symbol
- Waypoint Symbol
- Waypoint Symbol
- Waypoint Symbol
- Waypoint Symbol
- Waypoint Symbol

Targets

Check that the targets are displayed correctly.

- Target Symbol
- Target Symbol
- Target Symbol
- Target Symbol
- Target Symbol
- Target Symbol

Route Alerts

Check that the route alerts are displayed correctly.

- Route Alert Symbol
- Route Alert Symbol
- Route Alert Symbol
- Route Alert Symbol
- Route Alert Symbol
- Route Alert Symbol

ECDIS Navigation Aids

Check that the ECDIS navigation aids are displayed correctly.

- ECDIS Navigation Aid Symbol
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Alarm Level

Check that the alarm level is displayed correctly.

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DAFTAR RIWAYAT HIDUP

Nama : Setyanga Nur Pratama
Tempat/Tanggal lahir : Sleman, 05 Mei 1996
NIT : 51145262. N
Alamat Asal : Susuhan, Rt: 16/Rw: 03, Gedaren, Jatinom, Klaten
Agama : Islam
Pekerjaan : Taruna PIP Semarang
Status : Belum Menikah



Orang Tua

Nama Ayah : Trimanto Alm
Pekerjaan : -
Nama Ibu : Nuryanti
Pekerjaan : Guru
Alamat : Susuhan, Rt:16/Rw: 03, Gedaren, Jatinom, Klaten

Riwayat Pendidikan

1. SDN 1 Gedaren lulus tahun 2008
2. SMP Negeri 1 Karangnom lulus tahun 2011
3. SMA Negeri 1 Karangnom lulus tahun 2014
4. Politeknik Ilmu Pelayaran Semarang – sekarang

Pengalaman Praktek Laut

Nama Kapal 1 : NYK THEMIS
Nama Kapal 2 : NYK ORION
Perusahaan : NYK Ship-Management
Alamat 1 : 1 Harbourfront Pl, Singapore, 098633
Alamat 2 : PT. Cipta Wira Tirta di Plaza Tanjung Mas Raya Est. Block B1 No.17, Tanjung Barat, Pasar Minggu, Kota Jakarta Selatan, Daerah Khusus Ibukota Jakarta 12530, Indonesia.