



MANAGING RISK

DNV

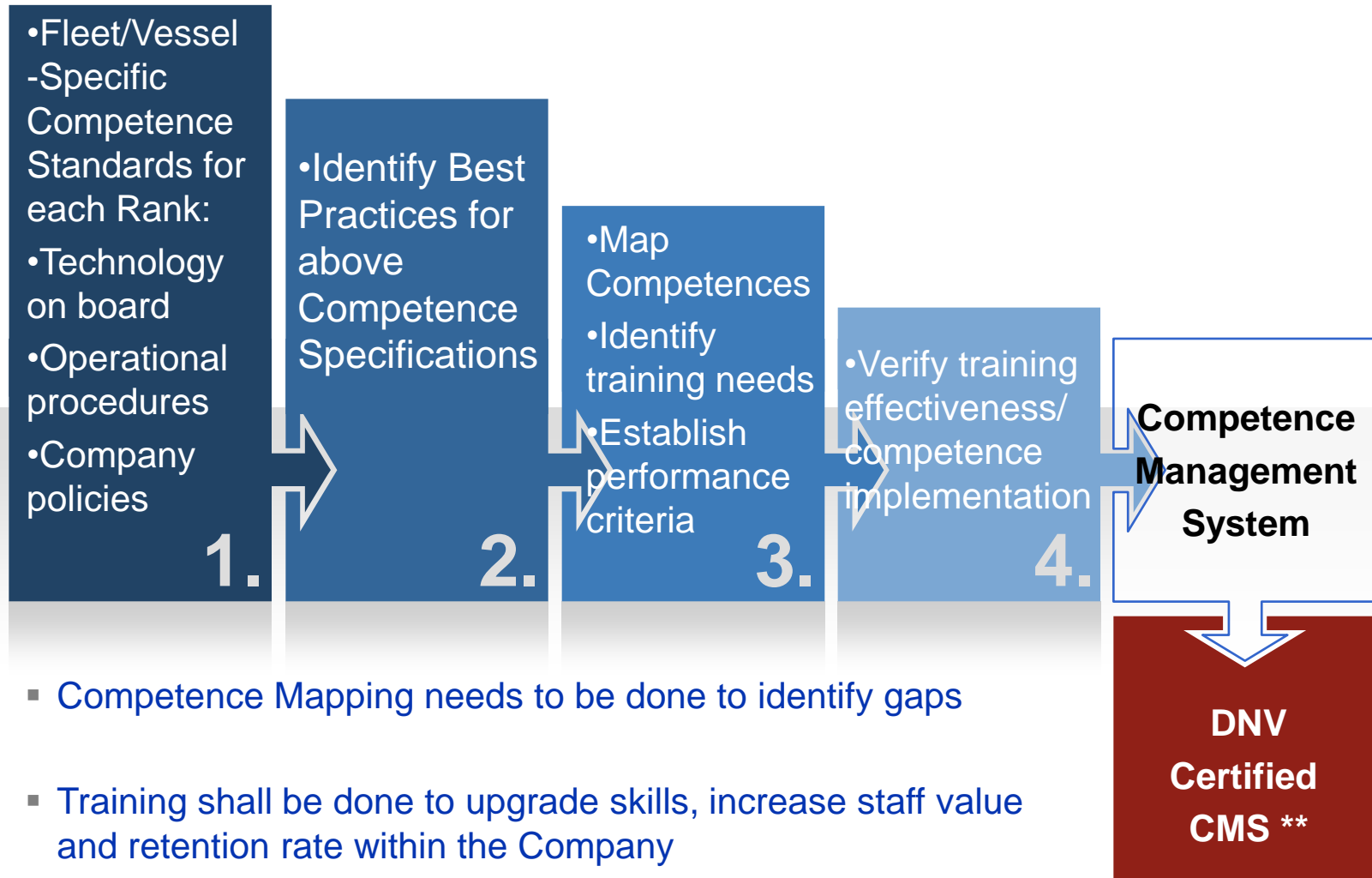
Developing Crew Competence Standards - a Practical Approach



The Company of Master Mariners of Canada
St. John's, Newfoundland

Gordon Halsey – DNV SeaSkill™
1st October 2009

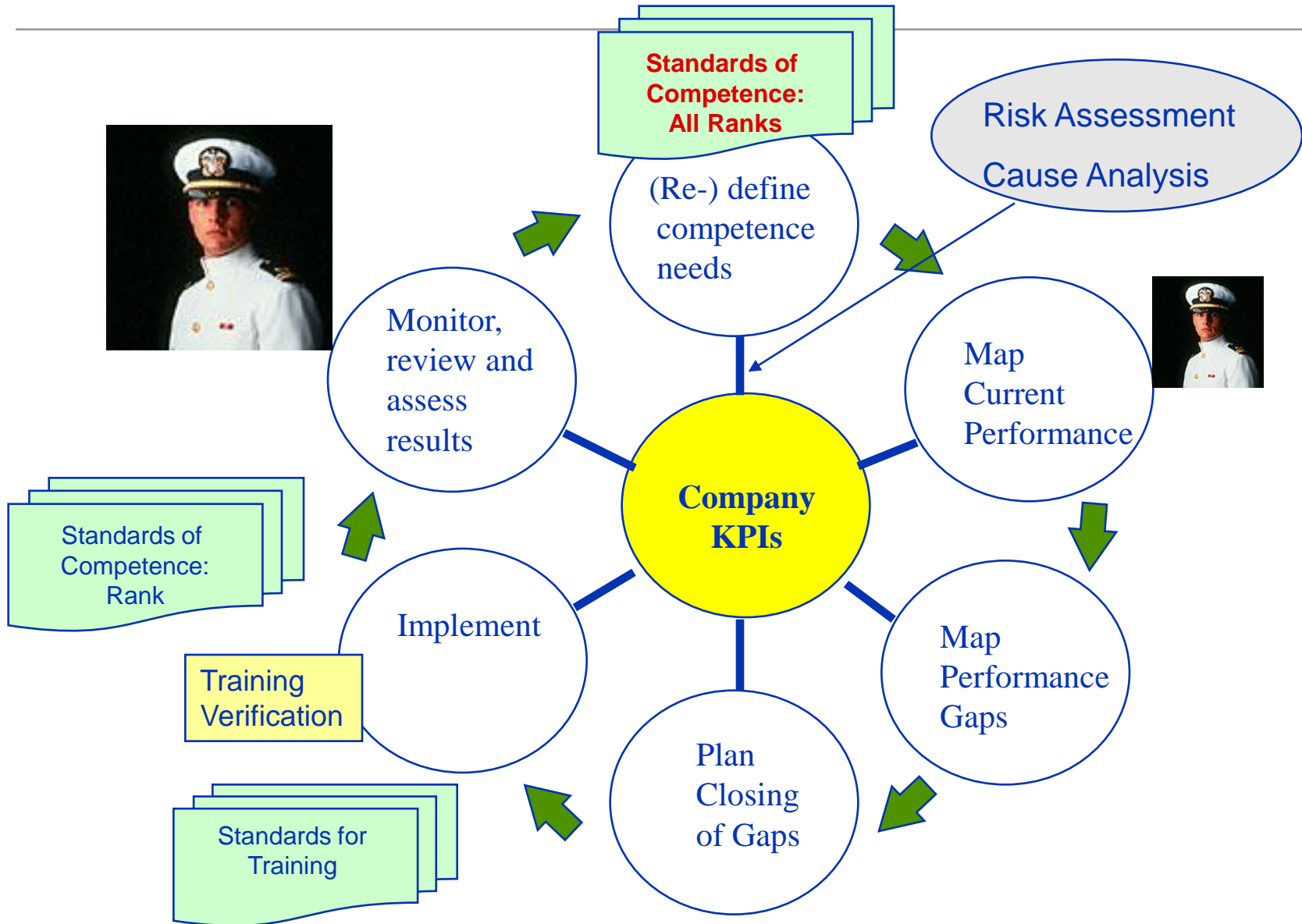
Competence Management System (CMS)



- Competence Mapping needs to be done to identify gaps
- Training shall be done to upgrade skills, increase staff value and retention rate within the Company

- **** Optional**

CMS – Process overview



Workshops to identify operational tasks



- Identify the tasks



- Identify the risks involved in carrying out the tasks



- For a given scenario
- “WALK THE VOYAGE”



- Produce a set of core competencies

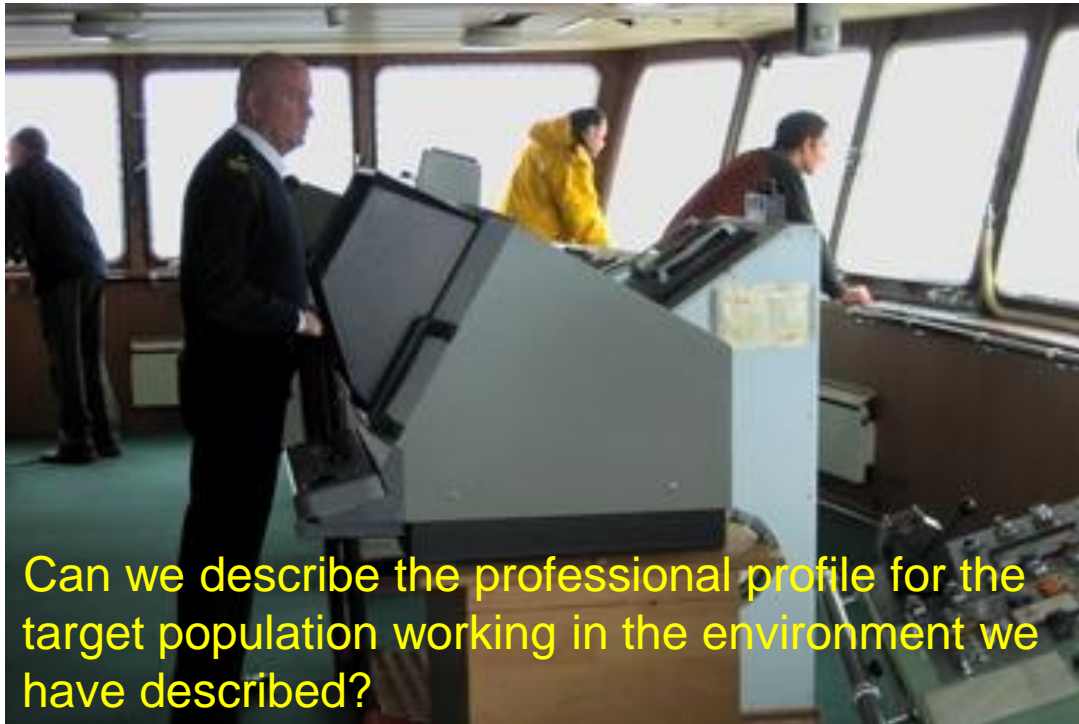
Such as

- For a representative vessel type
- In an area where content standards exist
- For a specified operation
- For a specified target population

e.g.

- New application, no previous standard
- IMO model course or approved standard (e.g., STCW)
- Liquid bulk cargo
- Master, Deck Officer, Electrician

The professional profile - what the person must be able to do



Here is an example of a description of the professional profile or capabilities required for the target population:

The ship's officer should be capable of taking command of the ship, operating the ship's controls for the propeller, rudder and thrusters, and using tugs in a variety of environmental conditions. The officer should be able to take the ship through a narrow and shallow channel requiring tight turns, swing the vessel off the berth and bring the ship alongside at a pre-determined position and be able to conduct the reverse sequence of operations to take the ship to sea.

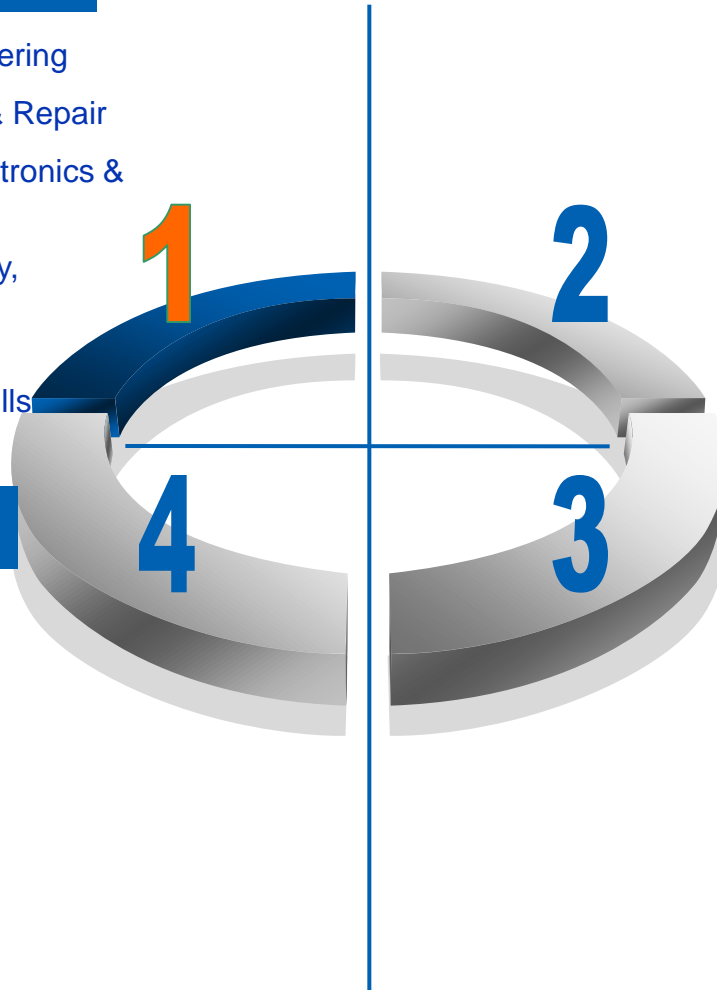
CMS - Stepwise developmental approach

Functional Competencies

- Navigation
- Cargo Operation & Stability
- Safety, Security, Environment & Emergencies
- Leadership Skills
- Marine Engineering
- Maintenance & Repair
- Electrical, Electronics & Controls
- Safety, Security, Environment & Emergencies
- Leadership Skills

Performance Criteria

- Each “**Specific Competence Requirement**” provided with “Performance Criteria”



Areas of Competence

- Each “**Competence Function**” translated into “Areas of Competence” relevant to the Rank

Specific Competence

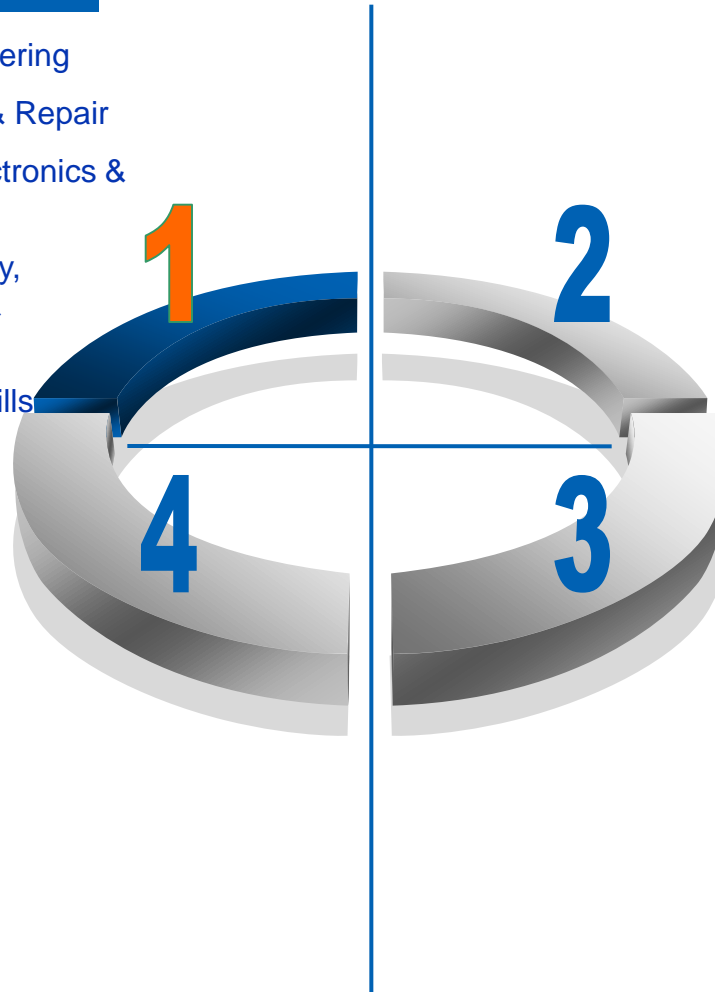
- Each “**Area of Competence**” translated into “Specific Competence Requirements”

Training and Assessment can be conducted at Functional, Area &/or Specific Competence level

CMS - Stepwise developmental approach

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Technical Competencies

Operations

Maintenance & Repair

Safety, Security & Environment

Leadership Skills

Nautical (Master/Chief Officer, 2nd & 3rd Officer):

- Navigation
- Ship Stability & Maintenance
- Cargo Operations (Oil & Gas)
- Safety, Security and Environment
- Leadership Skills

Engineering (Chief/2nd Engineer, 3rd/4th Engineer, Jr Engineer, Cargo Engr & Elect Officer):

- Marine Engineering
- Electrical, Electronics and Control
- Maintenance and Repair
- Safety, Security, Environment and Emergencies
- Leadership Skills

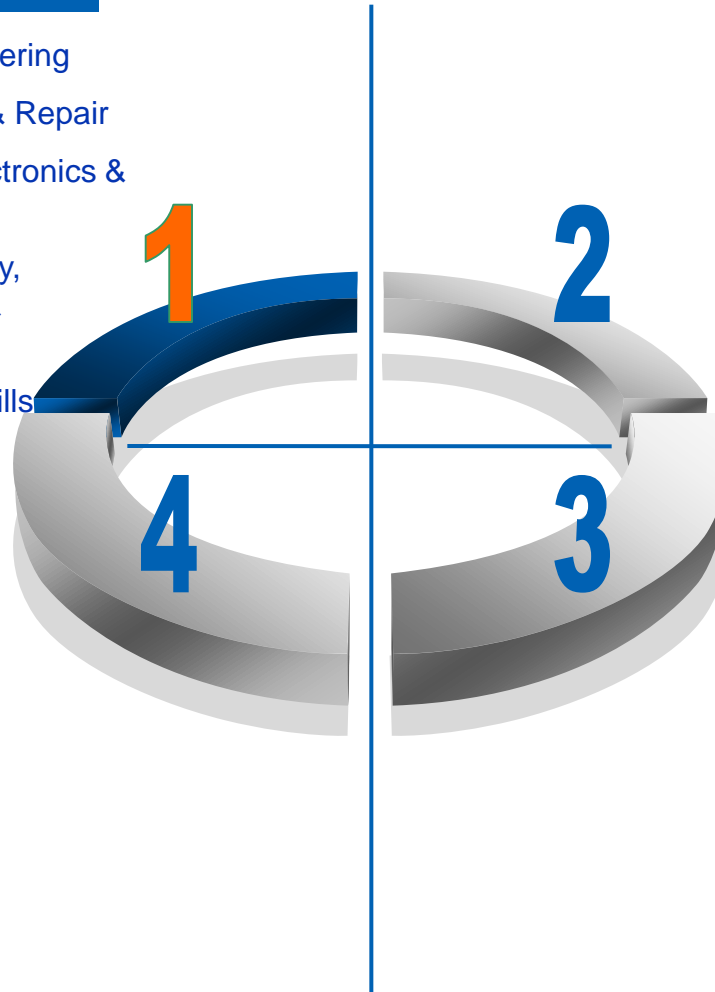
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Master & C/O – areas of competence (e.g.)

Areas of Competence



Table 1: Areas of Competence

Management Level

1. Navigation

- 1.1 Voyage Planning
- 1.2 Meteorology
- 1.3 Global Maritime Distress and Safety System
- 1.4 Collision Regulations
- 1.5 Ship Handling Techniques
- 1.6 Search and Rescue
- 1.7 Bridge Team Management
- 1.8 Legislative & Commercial Operational Requirements

2. Health, Safety, Security and Environment

- 2.1 Health and Safety
- 2.2 Security
- 2.3 Environment

3. Leadership and Management Skills

Deck Officer – areas of competence (e.g.)



MANAGING RISK

Areas of Competence



Table 1: Areas of Competence

Operational Level

1. Navigation

- 1.1 Voyage Planning & Execution
- 1.2 Bridge Watch-keeping & Position Fixing
- 1.3 Electronic Navigation Aids
- 1.4 Meteorology
- 1.5 Global Maritime Distress & Safety System (GMDSS)
- 1.6 Collision Regulations
- 1.7 Ship Handling Techniques
- 1.8 Navigational Maintenance
- 1.9 Deck Machinery
- 1.10 Documentation

2. Cargo Operation and Stability

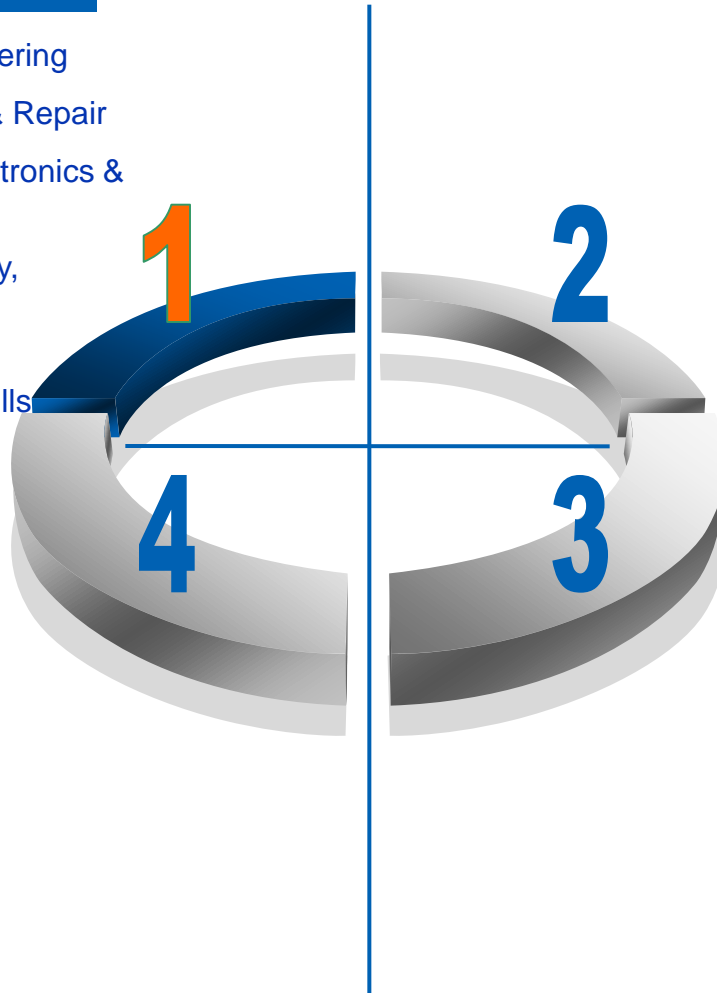
- 2.1 Ship stress and stability
- 2.2 Oil (Crude and Product)
- 2.3 LNG / LPG

3. Health, Safety, Security and Environment

- 3.1 Fire Fighting Appliances & Techniques
- 3.2 Life Saving Appliances & Techniques
- 3.3 Security Practices on Board
- 3.4 Port State Control
- 3.5 Environmental Pollution Prevention, Conventions & Legislation
- 3.6 HSSE and QA System

Functional Competencies

- Navigation
- Cargo Operation & Stability
- Safety, Security, Environment & Emergencies
- Leadership Skills
- Marine Engineering
- Maintenance & Repair
- Electrical, Electronics & Controls
- Safety, Security, Environment & Emergencies
- Leadership Skills



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Specific Competence

- Each “**Area of Competence**” translated into “**Specific Competence Requirements**”

TABLE 2: Areas of Competence and Specific Competence Requirements

NAVIGATION	
1.1	Voyage Planning & Execution
1.1.1	Plan a voyage, taking into account the expected climatologic and weather conditions as well as Company guidelines and other applicable navigational factors
1.1.2	Calculate the heights and timings of high and low water, including spring and neap ranges at Standard and Secondary ports
1.1.3	Check a nautical chart for its suitability to be used for voyage and navigational purposes
1.1.4	Demonstrate procedures to correct a nautical chart using relevant information from the Notice to Mariners, including Temporary & Preliminary notices
1.1.5	Extract, assess and apply relevant information available from the monthly routing charts for passage planning purpose

Function, area and specific competence

1. Navigation

1.1 Voyage Planning & Execution

- (a) Plan a voyage, taking into account the expected climatologic and weather conditions as well as Company guidelines and other applicable navigational factors
- (b) Check a nautical chart for its suitability to be used for voyage and navigational purposes

1.2 Bridge Watch-keeping & Position Fixing

- (a) Determine and correct side error, error of perpendicularity and index error of a sextant
- (b) Determine risk of collision, using all available means, including use of any electronic aids available on board

1.3 Electronic Navigation Aids

1.4 Meteorology

1.5 Global Maritime Distress & Safety System (GMDSS)

1.6 Collision Regulations

1.7 Ship Handling Techniques

1.8 Navigational Maintenance

1.9 Documentation

Competence Function

Area of Competence

Specific Competencies
(Tasks)

Anatomy of a competence requirement

2.0	Basic manoeuvring		
2.1	<i>Establish slow speed control</i>		
2.1.1	Calculate distance from dock or berth to establish slow speed control		A
2.1.2	Identify slow speed regime for ship		U
2.1.3	Set rudder angle before "kick ahead"		A
2.1.4	Use "kick ahead" for transverse control		A
2.1.5	Balance with short periods of modest stern power		A
2.1.6	Return rudder amidships after stopping engine		A
2.1.7	Recognise the correlation between speed and wake wash		K
2.1.8	Anticipate effect of wake wash along the intended route		A
2.1.9	Adhere to company regulations regarding speed in confined waters		K
2.2.10	Minimise periods of "no control"		I
2.2.11	Set allowable "quick astern" order at berth		A

The task/competence domain

The task

The competence requirements

Level of cognition
Knowledge, Understanding, Application, Integration
(used to determine assessment)

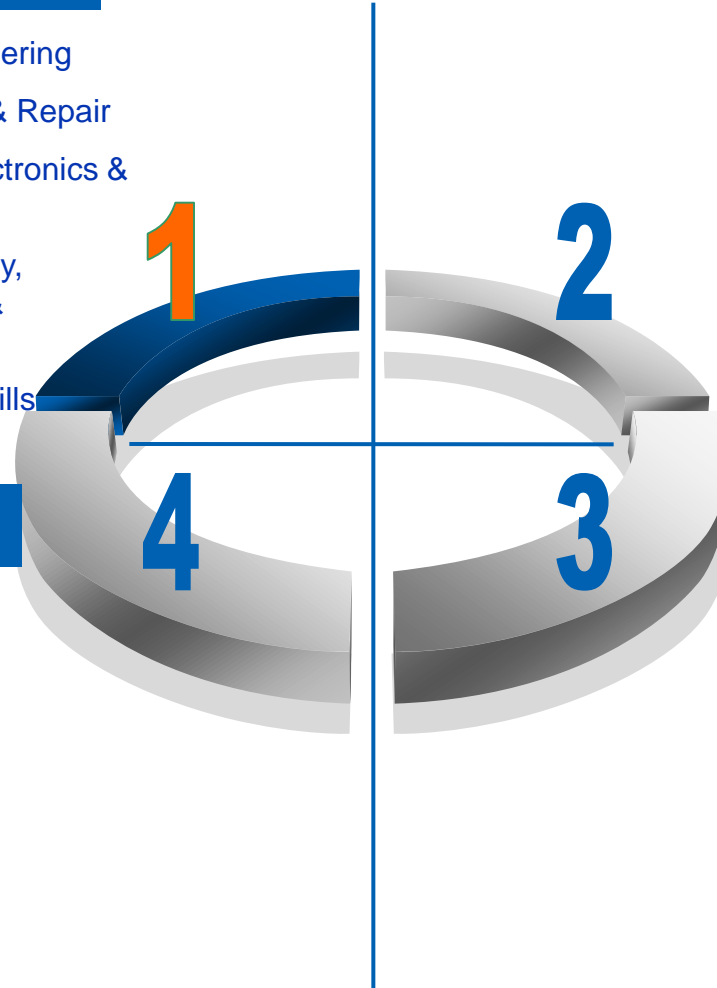
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Training and Assessment can be conducted at Functional, Area &/or Specific Competence level

Second & Third Officer

Competence Mapping

Competence Mapping ID: 2030/1.1.1
Voyage Planning: Plan a voyage

Area of Competence

- 1 Performance Objectives**
Plan a voyage, taking into account the expected climatologic and weather conditions as well as Company guidelines and other applicable navigational factors
- 2 Safety Precautionary Measures**
N/A
- 3 Equipment List**
Relevant charts, weather forecast, nautical publications
- 4 Performance Standards (Ps)**

Specific Competence Requirement

	Performance Standards (Ps) Planned and carried out in accordance with Best Practices, Established Rules, and Regulations	Remarks by Assessor during Assessment (E _c)
1	Appraisal	
1.1	<i>Gather data from nautical publications, company manuals, charterer's instructions, weather reports, guide to port entry and past port calls information records</i>	
2	Planning	
2.1	<i>Verify "No Go" areas, abort points, contingency planning and safety margins, safe speed, company UKC policy & squat, primary & secondary means of positioning fixing, reporting to VTS, notices for engine readiness & engine status at special points</i>	
2.2	<i>Use data from tidal streams atlas, current and routing charts to estimate effects of climatic conditions on ships speed made good</i>	
2.3	<i>Comply with Load Line Convention with regards to seasonal load line restrictions, applicable zones along the intended passage and bunker requirements</i>	
2.4	<i>Analyse if ice conditions are expected en-route</i>	
2.5	<i>Consider contingency plans – alternate routes, contingency anchorages, ports of refuge, critical systems and equipment failures</i>	
2.6	<i>Comply with charterer's instructions</i>	
2.7	<i>Consider routing information provided, in case vessel subscribes to a shore based routing service</i>	
3	Execution & Monitoring	
3.1	<i>Prepare the plan and execute it during the performance of the voyage</i>	

Performance Criteria for uniform assessment

CMS

**Leadership
Planning**

**Recruitment
& Selection**

CMS

**Competence &
Skills
Development**

**Performance
Appraisal**

Promotions

Generic DNV Competence Standards

- [Standard3-301 competence of ships superintendents.pdf](#)
- [Standard3-302 competence of shipboard lng cargo operators.pdf](#)
- [Standard3-303 stcw basic safety for seafarers.pdf](#)
- [Standard3-304 Competence of ships electrical officers and engineers.pdf](#)
- [Standard3-305 competence of shore side personnel handling dangerous goods.pdf](#)
- [Standard3-307 ship-handling competence requirements for berthing and unberthing large vessels.pdf](#)
- [Standard3-310 competence of tender operators.pdf](#)
- [Standard3-312 competence of officers for navigation in ice.pdf](#)
- [Standard3-317 shipboard cargo operators crude oil tankers.pdf](#)
- [Standard3-318 shipboard cargo operators product tankers.pdf](#)
- [Standard3-319 shipboard cargo operators chemical tankers.pdf](#)



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