

Proposal to modernise the Methodology of Teaching, Assessment/ Examination

ETO - STCW III/6 CoC			
Competency/ Module: Marine Navigation Systems			
Knowledge, understanding and proficiency	Recommendation of working group regarding the outcome and objective.	Rationale	Action required
Outcome1: Analyse marine radar and automatic radar plotting systems	Keep	Relevant	None
1.1 Calculate and explain the factors affecting minimum range, range discrimination, bearing discrimination, scanner speed	Contextualise	It is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.	Move focus from calculations to understanding of principles and terminology as more relevant to operations on board.
1.2 Calculate and explain the correlation between scanner speed, Pulse Repetition Frequency (PRF), Horizontal Bandwidth (HBW).	Contextualise	It is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.	Move focus from calculations to understanding of principles and terminology as more relevant to operations on board.
1.3 Modes of presentation	Keep	Relevant	None
1.4 Radar/ARPA systems	Keep	Relevant	None
1.5 Target acquisition and tracking	Keep	Relevant	None
1.6 System Interfacing requirements	Keep	Relevant	None
Outcome 2: Analyse terrestrial and satellite position fixing and transponder systems	Keep	Relevant	None

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2.1 Principles of a Global Position System (GPS)	Keep	Relevant	None
2.2 Operation of GPS	Keep	Relevant	None
2.3 Operation of GPS receivers	Keep	Relevant	None
2.4 Principles of operation of the eLoran system	Remove	This has been removed from NAEST so no longer relevant.	Remove this outcome
2.5 Operation of the eLoran system	Remove	This has been removed from NAEST so no longer relevant.	Remove this outcome
2.6 Principles of operation of Automatic Identification Systems (AIS)	Keep	Relevant	None
2.7 AIS data transmission	Keep	Relevant	None
2.8 Interfacing of AIS and GPS	Keep	Relevant	None
Outcome 3: Explain ship speed and distance measuring systems and echo sounding systems	Keep	Relevant	None
3.1 Factors affecting the speed of sound in seawater	Keep	Relevant	None
3.2 Losses affecting sound propagation through sea water	Keep	Relevant	None
3.3 Absolute and relative speed	Keep	Relevant	None
3.4 Construction and use of electrostrictive transducers for speed and distance measurement	Keep	Relevant	None
3.5 Doppler shift measurement compensation for trim and pitch	Keep	Relevant	None
3.6 Compensation methods for change in salinity and temperature of sea water	Keep	Relevant	None

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3.7 Ship speed measurement system, electromagnetic log	Keep	Relevant	None
3.8 Marine echo sounding system	Keep	Relevant	None
3.9 The principles of echo sounding	Keep	Relevant	None
Outcome 4: Assess automatic steering systems	Keep	Relevant	None
4.1 Regulations governing automatic steering systems	Keep	Relevant	None
4.2 Non follow up (NFU) and follow up (FU) control of electro-hydraulic steering gear	Keep	Relevant	None
4.3 The components of a marine autopilot system	Keep	Relevant	None
4.4 Application of three term control and the effect of control settings on autopilot	Keep	Relevant	None
4.5 Integration of autopilot with other navigation systems	Keep	Relevant	None
Outcome 5: Explain marine compass and repeater systems	Keep	Relevant	None
5.1 Principles of operation of a magnetic compass	Keep	Relevant	None
5.2 Construction and location of a marine magnetic compass	Keep	Relevant	None
5.3 Principle of a free gyroscope	Keep	Relevant	None
5.4 Construction of a marine gyro compass	Keep	Relevant	None

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5.5 Operation of a marine gyro compass	Keep	Relevant	None
5.6 Compass repeater systems	Keep	Relevant	None
5.7 Principles of other compasses used in the maritime industry (e.g. Fibreoptic)	Add	Other compasses are used at sea and should be covered in this outcome. However, as they are less common, it will not be required to cover them in as much detail as magnetic and gyrocompasses.	Add the outcome, “Principles of other compasses used in the maritime industry (e.g. Fibreoptic)”
Proposal submitted by:	Any other outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:		
	Objective	Reason Why	Action required
Cadet Training & Modernisation Working Group	Basic overview of Dynamic Positioning systems	Dynamic Positioning systems are now more common at sea and should be covered in this module.	Add an outcome including: <ul style="list-style-type: none"> - Examples of different types - Principles of DP systems. - Understanding of standard signals working within a DP system
Cadet Training & Modernisation Working Group	Awareness of future navigational automation technologies	Navigational automation technology is becoming more common at sea and should be covered in this module.	Add an outcome including: <ul style="list-style-type: none"> - Overview of upcoming technologies and potential impact on ETOs. - Automation
Cadet Training & Modernisation Working Group	Working with Integrated Bridge Systems.	Integrated Bridge systems are now more common at sea and should be covered in this module.	Add an outcome including: <ul style="list-style-type: none"> - Fault finding challenges interacting with Integrated Bridge Systems - Working with shoreside technicians. - Understanding of the elements of an Integrated Bridge System
Cadet Training & Modernisation Working Group	Include Human Element Factors throughout the syllabus	To provide seafarers with a contextualised understanding of the Human Element in the maritime industry, showing how they can put	Raise awareness throughout the Cadet’s training of the areas in which human element factors will have an impact. Recommendations on where this can be

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		theory into practice in the work they carry out at sea.	included have been noted throughout the entire syllabus. Not every template has Human Element Factor recommendations but please do add any you feel may have been missed.
Cadet Training & Modernisation Working Group	Include Data Science skills throughout the syllabus	Data Science Skills (Comprehension, Analysis, Presentation, etc...) are already required within much of the syllabus. A further, specific focus on these skills needs to be taught where relevant.	A specific topic will need to be introduced to improve Cadets' Data Science skills. Practical application of data science skills should be highlighted throughout the syllabus. Not every template has Data Science recommendations but please do add any you feel may have been missed.
Cadet Training & Modernisation Working Group	Ensure all outcomes are contextualised to help Cadets understand what they are learning in relation to what they will experience at sea.	While some outcomes are intrinsically linked to work carried out at sea, some need to be contextualised to show how they apply to work on board. Where this is the case, it is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.	Where outcomes do not specifically cover a topic which relates to work carried out at sea, more must be done to contextualise the outcome and make it relevant to the maritime industry, giving specific shipping examples of how the outcome may be applied in a modern shipping context. Not every template has contextualisation recommendations but please do add any you feel may have been missed.