Proposal to modernise the Methodology of Teaching, Assessment/ Examination

Marine Engineering - STCW III/ 1 CoC	Name of respondent, organisation and role:		
Competency/ Module: Marine Engineering: Naval Architecture (Management Level)			
Knowledge, understanding and proficiency	**Recommendation of working group regarding the outcome and objective.**	**Rationale**	**Action required**
Outcome 1: Calculate small and large angle stability in marine vessels	Keep	Relevant	See sub-outcome actions
1.1 Inclining Experiment	Modernise	We must contextualise this topic in a stability context, to allow candidates to apply their knowledge using the tools they have at sea and showing how this will be practically applied on board.	Include practical applications of inclining experiments, using stability data given to the vessel and use of loading computers, relevant software and/or simulators
1.2 GZ Curves	Modernise	We must contextualise this topic in a stability context, to allow candidates to apply their knowledge using the tools they have at sea and showing how this will be practically applied on board.	Include the data available on board for intact stability criteria, damage stability criteria, and minimum GM and max KG tables. This should highlight the practical uses of this information as opposed to memorising theories.
1.3 Wall Sided Formula	Modernise	Unnecessary to teach calculations as the loading computer is used so there is no need for quick calculations. More focus can be placed on the practical impacts of this formula.	Remove calculations using wall sided formula. Include more focus on the use of loading computers, or relevant software, and the importance of water-plane area.
1.4 Longitudinal Stability	Modernise	We need to include information on parametric resonance and standardise the method of calculation of trim and stability.	Add information on Parametric Resonance. Use moments from Aft perpendicular as a standard for all teaching, learning and assessments.

1.5 Bilging	Modernise	We must contextualise this topic in a stability context, to allow candidates to apply their knowledge using the tools they have at sea and showing how this will be practically applied on board.	Include reading and interpreting down flooding points and down flooding angles from stability books/drawings. Modernise using ship-shape theoretical examples. Simplify box-shape calculations.
1.6 Simpsons Rule	Keep	Relevant	None
Outcome 2 Calculate ship powering and resistance from model test data	Keep	Relevant	See sub-outcome actions
2.1 Shear force and bending moment diagrams	Modernise	We must contextualise this topic to allow candidates to apply their knowledge using the tools they have at sea and showing how this will be practically applied on board.	Use stability information supplied to the vessel including design principles and sea trial data for this outcome as opposed to manual calculations.
2.2 Shear force and bending moment calculations	Modernise	We must contextualise this topic to allow candidates to apply their knowledge using the tools they have at sea and showing how this will be practically applied on board.	Remove calculations of Shear Forces and Bending Moments. Focus on the allowable seagoing and still water Shear Forces & Bending Moments.
2.3 Frictional Resistance	Modernise	The underlying calculations are unnecessary for seagoing staff, this work is done in the design stage. However, there is a practical impact of these principles for energy efficiency requirements and stability assessments using failure modes.	Teach the practical impacts to shipping, including emerging regulations and the impact on energy efficiency requirements and stability assessments using failure modes. Remove the requirement to teach the underlying calculations.
2.4 Residual Resistance	Modernise		
2.5 Model testing	Modernise		
2.6 Admiralty Coefficient	Modernise		

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Outcome 3: Calculate ship fuel consumption from propeller dimensions	Keep	Relevant	See sub-outcome actions
3.1 Fuel consumption	Modernise	We must contextualise this topic to allow candidates to apply their knowledge using the tools they have at sea and showing how this will be practically applied on board.	Use stability information supplied to the vessel including design principles and sea trial data for this outcome. Financial and environmental consequences of fuel consumption & routing: use of software for calculating these values including weather criteria.
3.2 Propeller calculations involving slip, thrust, torque and efficiency	Keep	Relevant	None
3.3 Relationship between powers	Keep	Relevant	None
3.4 Propeller cavitation	Keep	Relevant	None
3.5 Rudder balance and principal forces	Keep	Relevant	None
3.6 Rudder problems involving angle of heel	Keep	Relevant	None
Outcome 4: Discuss constructional details used to resist stress	Keep	Relevant	See sub-outcome actions
4.1 Stresses in ship's structures	Keep	Relevant	None

4.2 Structural components	Keep	Relevant	None
4.3 Fore and aft end construction	Keep	Relevant	None
4.4 Framing	Keep	Relevant	None
4.5 Ship's cross sections	REMOVE	This is covered in a level four outcome.	Remove as is a duplication of a level four outcome.
4.6 Bulkheads	Keep	Relevant	None
4.7 Rudders	Keep	Relevant	None
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	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 theory into practice in the work they carry out at sea.	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 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.

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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.