Proposal to modernise the Methodology of Teaching, Assessment/ Examination

Marine Engineering - STCW III/ 1 CoC	Name of respondent, organisation, and role:		
Competency/ Module: Eletro-Technology			
Knowledge, understanding and proficiency	**Recommendation of working group regarding the outcome and objective.**	**Rationale**	**Action required**
Outcome 1: Explain fundamental electrical concepts and quantify their electrical units	Keep	Relevant	See sub-outcome actions
1.1 Electrical charge, current, voltage, energy, power	Keep	Relevant	None
1.2 Potential difference, emf, resistance, inductance, and capacitance	Modernise	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.	Introduce a practical requirement for students to use multi-meters
1.3 Temperature coefficient of resistance	Modernise	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.	Deliver practically with constructed circuits that require students to measure resistance, voltage and current from a variety of sensors at different temperatures. Also use Pressure Temperature sensors to show how temperature affects resistance and where they are used.
Outcome 2: Solve problems on DC circuits with resistances in parallel and series	Keep	Relevant	See sub-outcome actions
2.1 Series resistive DC circuits	Keep	Relevant	None
2.2 Parallel resistive DC circuits	Keep	Relevant	None

2.3 Combination Series and Parallel resistive DC circuits	Keep	Relevant	None
2.4 Wheatstone bridge	Modernise	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.	This should be done as a lab-based demonstration. it can be tied into measuring differences in temperature using a Wheatstone bridge arrangement to measure the change in a resistor as it changes temperature.
Outcome 3: Solve problems on series single phase AC circuits comprising resistance, capacitance and inductance	Keep	Relevant	See sub-outcome actions
3.1 Basic use of polar and rectangular forms of complex number	Remove	Relevant to this module but this would be more appropriate to teach within the “Mathematics for Engineering” module.	Remove outcome 3.1. Add this outcome to the “Mathematics for Engineering” module renaming the outcome, "Contextualise use of polar and rectangular forms of complex numbers”
3.2 RLC series AC circuits	Keep	Relevant	None
3.3 Power factor, apparent power, true power, and reactive power	Keep	Relevant	None
3.4 Phasor diagrams	Amend	In depth knowledge of phasor diagrams is not required, they should only be taught to a basic level.	Reword this outcome to, “Basic knowledge of phasor diagrams”
Outcome 4: Explain high voltage at operational level in marine electrical practice	Keep	Relevant	None

4.1 High voltage marine generators and systems	Keep	Relevant	None
4.2 High voltage protection devices and circuit protection	Keep	Relevant	None
4.3 Insulated and earthed neutral distribution systems and earthing requirements	Keep	Relevant	None
4.4 Safety requirements necessary for HV installations	Keep	Relevant	None
4.5 Safe working practice and permit to work	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.

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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.