

# Proposal to modernise the Methodology of Teaching, Assessment/ Examination

<b>Marine Engineering - STCW III/ 1 CoC</b>	<b>Name of respondent, organisation, and role:</b>		
<b>Competency/ Module: Electrical Machines</b>			
<b>Knowledge, understanding and proficiency</b>	<b>Recommendation of working group regarding the outcome and objective.</b>	<b>Rationale</b>	<b>Action required</b>
<b>Outcome 1: Explain the layout and component parts of typical marine electrical distribution systems</b>	Keep	Relevant	See sub-outcome actions
1.1 Power distribution system	Keep	Relevant	None
1.2 Insulated and earthed neutrals systems	Keep	Relevant	None
1.3 Distribution circuit breakers	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.	Include operation, equipment and safety precautions of High Voltage systems, including VCB (vacuum circuit breakers).  Include types and principles of operation and safety.
1.4 Power and instrument transformers	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	Include types and principles of operation and safety.

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		future seagoing technologies and practices.	
1.5 Circuit protection	Keep	Relevant	None
<b>Outcome 2: Explain the construction and operation of AC generators</b>	Keep	Relevant	None
2.1 AC generator construction and cooling	Keep	Relevant	None
2.2 AC generator operation	Keep	Relevant	None
2.3 Excitation methods	Keep	Relevant	None
2.4 Automatic Voltage Regulation	Keep	Relevant	None
2.5 Generators in parallel	Keep	Relevant	None
2.6 Emergency generators	Keep	Relevant	None
<b>Outcome 3: Explain the construction and operation of AC motors</b>	Keep	Relevant	See sub-outcome actions
3.1 Three phase induction and synchronous motors	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.	Include frequency converters applications for control of inductive motors speed (3 phase, high power).
3.2 Construction of three phase induction and synchronous motors	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	Include frequency converters applications for control of inductive motors speed (3 phase, high power).

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		future seagoing technologies and practices.	
3.3 Characteristics of three phase induction and synchronous motors	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.	Include frequency converters applications for control of inductive motors speed (3 phase, high power).
3.4 Starting of three phase induction motors	Keep	Relevant	None
3.5 Speed control of three phase induction and synchronous motors	Keep	Relevant	None
<b>Outcome 4: Explain the operation of electronic devices in power circuits</b>	Keep	Relevant	None
4.1 Operation and characteristics of a thyristor	Keep	Relevant	None
4.2 Phase shift control of a thyristor circuit	Keep	Relevant	None
4.3 Operation and characteristics of Zener diode	Keep	Relevant	None
4.4 DC stabilizer circuits	Keep	Relevant	None
Proposal submitted by:	<b>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:</b>		

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	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.
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	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

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		that this context is given with reference to current and future seagoing technologies and practices.	context. Not every template has contextualisation recommendations but please do add any you feel may have been missed.
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