Proposal to modernise the Methodology of Teaching, Assessment/ Examination

ETO - STCW III / 6 CoC			
Competency/ Module: Applications of Power Electronics in Electrical Motor Drive Systems			
Knowledge, understanding and proficiency	**Recommendation of working group regarding the outcome and objective.**	**Rationale**	**Action required**
Outcome1: Explain the operation of single-phase converters and D.C. choppers	Keep	Relevant	None
1.1Single phase converters (half-wave controlled and full wave-controlled rectifier circuits)	Keep	Relevant	None
1.2 Application of single-phase converters in the speed control of D.C. motors	Keep	Relevant	None
1.3 D.C. chopper circuits	Keep	Relevant	None
1.4 Application of D.C. chopper circuits in the speed control of D.C. motors	Keep	Relevant	None
Outcome 2: Explain the operation of three-phase converters, A.C. to A.C. regulators and inverters	Keep	Relevant	None
2.1 Three-phase convertors (three-phase diode bridge, half controlled three-phase bridge converter, full controlled three-phase bridge converter)	Keep	Relevant	None

2.2 A.C. to A.C. regulators (phase control, burst firing)	Keep	Relevant	None
2.3 Application of A.C. to A.C. converters in the speed control of a universal motor	Keep	Relevant	None
2.4 Inverters (voltage source, current source, PWM, D.C. link)	Keep	Relevant	None
Outcome 3: Investigate and analyse the operation and performance of an electronically controlled motor speed control system	Keep	Relevant	None
3.1 Block diagram of the system	Keep	Relevant	None
3.2 Description of system operation	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.	Ensure cadets understand the different, modern types of electronically controlled motor speed control systems and how they work.
3.3 Waveforms	Modernise	This is an important area to include data science skills, we must ensure Cadets can comprehend and analyse the data provided by waveforms.	Include fault finding and interpretation of wave forms.
3.4 Key performance characteristics	Modernise	This is an important area to include data science skills, we must ensure Cadets can comprehend and analyse the data provided by efficiency graphs.	Include interpretation of efficiency graphs produced by electronically controlled motor speed control systems.
3.5 Starting and braking	Keep	Relevant	None
3.6 Protection	Keep	Relevant	None
Proposal submitted by:			

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	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.
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.