

Proposal to modernise the Methodology of Teaching, Assessment/ Examination

ETO - STCWIII/6 CoC	Name of respondent, organisation and role:		
Competency/ Module: Applications of programmable Logic Controllers			
Knowledge, understanding and proficiency	Recommendation of working group regarding the outcome and objective.	Rationale	Action required
Outcome 1: Explain and classify PLC hardware	Keep	Essential	See Sub-outcome actions.
1.1 Architecture of a PLC	Modernise	Modernise to reflect current technologies used at sea.	Update the sub-outcome to include components of different types of PLC and Human Machine Interfaces (HMI).
1.2 Function of the element parts of a PLC	Keep	Relevant	None
1.3 Causes and consequences of failures within a PLC controlled system	Modernise	Contextualise to help students understand the application of this at sea	Use software to find causes and effect of failures
1.4 Classification of PLC systems (in terms of memory capacity, number of input and output terminals, complexity of programming functions, and typical application)	Modernise	Contextualise to help students understand the application of this at sea	Include communication links/ protocols

Proposal to modernise the Methodology of Teaching, Assessment/ Examination

1.5 Benefits of PLC control systems	Modernise	Contextualise to help students understand the application of this at sea	Include information on the applications of PLC for different systems on board
Outcome 2: Describe the operation of PLC software	Keep	Essential	See Sub-outcome actions.
2.1 Function and operation of a timer within a PLC program	Modernise	Contextualise to help students understand the application of this at sea	Focus on implementation. This whole section is currently theory based when it should be practically implemented. This could be done via simulation or practically (e.g. with models/ rigs/ timing diagrams) Include instructions for Timer on/off/retention in practical application using basic programmes
2.2 Function and operation of a counter within a PLC program	Modernise	Contextualise to help students understand the application of this at sea	Include practical to visualise counter functions/ and effect of count up/ down instructions
2.3 Function and operation of a latching circuit within a PLC program	Keep	Relevant	None
2.4 Function and operation of a shift register within a PLC program	Keep	Relevant	None
2.5 Function and operation of auxiliary relays within a PLC program	Keep	Relevant	None
2.6 Interpretation of PLC programs	Keep	Relevant	None
2.7 Method of program execution	Keep	Relevant	None

Proposal to modernise the Methodology of Teaching, Assessment/ Examination

Outcome 3: Simulate the safe control of an industrial process by the application of PLC technology	Keep	Essential	See Sub-outcome actions.
3.1 Preparation of a PLC program to simulate safe control of an industrial process	Modernise	Contextualise to help students understand the application of this at sea	Use simulations, such as Multisim, to teach students more about the installation of PLCs Include an awareness of programming in PLC
3.2 Allocation of PLC inputs and outputs	Keep	Relevant	None
3.3 Entering a program into a PLC	Keep	Relevant	None
3.4 Editing a PLC program	Keep	Relevant	None
3.5 Verifying correct operation of a PLC program	Modernise	Contextualise to help students understand the application of this at sea	Include troubleshooting, testing software, debugging and editing
3.6 Demonstrating the operation of a PLC program	Keep	Relevant	None
3.7 Documentation of control strategy and software	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

Proposal to modernise the Methodology of Teaching, Assessment/ Examination

Cadet Training & Modernisation Working Group	Add a cyber security outcome	To provide seafarers with an understanding of the relevance of cyber security in a maritime context	Consult with subject matter experts and create a new outcome to add to the syllabus
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.