

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

ETO - STCW III / 6 CoC			
Competency/ Module: Electronic Fault Finding			
Knowledge, understanding and proficiency	Recommendation of working group regarding the outcome and objective.	Rationale	Action required
<b>Outcome 1: Explain the techniques of fault diagnosis in electronic circuits and systems</b>	Keep	Relevant	None
1.1 Sequential and non-sequential fault location methods	Keep	Relevant	None
1.2 Systematic fault location methods eg input to output, output to input, half-split	Keep	Relevant	None
1.3 Fault location methods in complex systems eg divergence, convergence, alternative path	Keep	Relevant	None
1.4 Exceptional faults eg manufacturing faults, multiple faults, catastrophic failure	Keep	Relevant	None
1.5 Faults in micro-controllers in digital electronic circuits	Add	Micro-controllers are widely used within the maritime industry and should now be included in the syllabus.	Add the sub-outcome, "Faults in micro-controllers in digital electronic circuits"
<b>Outcome 2: Implement a fault location strategy in an electronic system</b>	Keep	Relevant	None
2.1 Identify risks and use safe working practices	Keep	Relevant	None

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2.2 Identify fault symptoms in terms of system operation	Keep	Relevant	None
2.3 Interpret fault symptoms using test equipment and/or diagnostic aids	Keep	Relevant	None
2.4 Locate faulty circuit using system documentation and test equipment	Keep	Relevant	None
2.5 Design and analyse simple analogue and digital circuits	Add	Understanding how to design and analyse simple analogue and digital circuits will enhance an ETO's problem solving skills.	Add the sub-outcome, "Design and analyse simple analogue and digital circuits"
<b>Outcome 3: Locate faults to component level in digital and analogue circuits</b>	<b>Contextualise</b>	<b>It is important to make sure Cadets clearly understand how this 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.</b>	<b>Include more focus on practical work during the teaching of this outcome.</b>
3.1 Identify risks and use safe working practices	Keep	Relevant	None
3.2 Identify fault symptoms in terms of system operation	Keep	Relevant	None
3.3 Select a suitable fault location method	Keep	Relevant	None
3.4 Locate a fault to component level on an analogue system	Keep	Relevant	None
3.5 Locate a fault to component level on a digital system	Keep	Relevant	None
3.6 Use appropriate test equipment	Keep	Relevant	None
3.7 Correct use of a circuit diagram	Keep	Relevant	None

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3.8 Using shoreside assistance for fault finding.	Add	<p>This is an important part of the work carried out onboard a modern ship, where fault finding will be carried out collaboratively between ship and shore.</p> <p>We will also need to cover the Human Element factors impacting this way of working, including the understanding of the differences between shoreside and shipboard ETO work.</p>	Add this outcome, “Using shoreside assistance for fault finding.”
<b>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>Objective</b>	<b>Reason Why</b>	<b>Action required</b>
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	While some outcomes are intrinsically linked to work carried out at sea,	Where outcomes do not specifically cover a topic which relates to work carried out

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	<p>Cadets understand what they are learning in relation to what they will experience at sea.</p>	<p>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.</p>	<p>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.</p>
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