Part D Instructor's Guide

Instructions: The Instructor's Guide (I.G.) also known as lesson plan is developed by the instructor which serves as a road map of what the trainees need to learn and how it will be done effectively. The format below shall be used to ensure uniformity. However, the MTI is required to specify teaching and learning activities, and develop appropriate Instructional Materials suitable for the learning outcomes.

			Competence: Manage operation	ation of electrical and elect	ronic control equipment
Course: Management Level Course for Marine		Knowledge, Understanding			
		electronics, power electronic	s, automatic control engine	ering and safety devices	
	Officers (Function		Topics:		
Lingineer C		12)	Course Introduction		
			1. Marine electrotechnol	ogy, electronics, power ele	ctronics, automatic
			control engineering ar	nd safety devices	
Lecture T	wenty-Four (24)	Trainees	Learning Outcome/s: At the		
	• • • •		Refer to Part C Course Sylla		ing Outcomes
Class Lay	out: Layout suita	able theoretical part	Formative Assessment: W	ritten and Practical Test	
Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
1 hour	Introduction	 Course Introduction Requirements in Regulation III/2 in relation to Section A- III/2, Table A-III/2 Competences and KUPs in Table A-III/2 Objectives of the course Course requirements Introduction to leadership skills that a 	 Class orientation/ briefing Lecture/Discussion or other teaching methods suitable for theoretical aspect Presentation of the ILOs or other activities to motivate the trainees 	Listening, note taking, inquiring, answering questions, interactive discussion	 Visual presentation STCW Convention

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
		 management level should possess Intended Learning Outcome (ILO) 			
6 hours and 30 minutes	- Core Elements	1. Marine electro technology, electronics, power electronics, automatic control engineering and safety devices	The MTI is required to specify suitable activities for the delivery of the topics.	The MTI is required to specify suitable learning activities.	 Visual presentation Training Video SOLAS Convention Sample operating manual
3 hours		Practical Exercise 1 Manage the operation of electrical and electronic equipment and system, and safety devices	Practical Exercise 1 The MTI is required to specify suitable activities for the conduct of practical exercises in Managing the operation of electrical and electronic equipment and system, and safety devices	Practical Exercise 1 Participating in the practical exercise on managing the operation of electrical and electronic equipment and systems, and safety devices	 Exercise Sheet A4.1 Sample operating manual Engine Room Simulator (ERS)
30 minutes	Conclusion	Marine electro technology, electronics, power electronics, automatic control engineering and safety devices	 Make generalization and abstraction of the lesson Assess the learning which may come from any of the following: Formative test; Oral Examination; Assignment; Other activities to check the retention of learning 	 Participating, sharing insights, and learning gained Answering/asking questions 	Visual presentation

Course: Management Level Course for Marine Engineer Officers (Function 2) Lecture: Twenty-Four (24) Trainees		and safety devices for and steam boiler Learning Outcome/s: At the	g and Proficiency: Design control equipment and safe oution system, and steam b system configurations of au r main engine, generator ar e end of the session, the tra	features and system ty devices for main oiler tomatic control equipment nd distribution system, ainees should be able to:	
	• • • •	able for the theoretical part	Refer to Part C Course Sylla Formative Assessment: W		ing Outcomes
Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
30 minutes	Introduction	 Marine electro technology, electronics, power electronics, automatic control engineering and safety devices Intended Learning Outcomes (ILO) 	 Review of previous lessons Presentation of the Training Outcomes, Course Content, and ILOs 	Listening, note taking, inquiring, answering questions, interactive discussion	Visual presentation
8 hours	Core Elements	2. Design features and system configurations of automatic control equipment and safety devices for main engine, generator and distribution system, and steam boiler	The MTI is required to specify suitable activities for the delivery of the topics.	Participating, note taking, watching video clips, sharing insights and learning gained, asking and answering questions,	 Visual presentation Training Videos SOLAS Convention Sample operating manual
		Practical Exercise 2 Manage the operation of the automatic control	Practical Exercises 2 and 3	Practical Exercises 2 and 3	• Exercise Sheet A4.2 and A4.3

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
4 hours		equipment and safety devices for main engine, generator and distribution system, and steam boiler Practical Exercise 3 Carry our assessment and adjustment of the automatic control equipment and safety devices for main engine, generator and its distribution system, and steam boiler	The MTI is required to specify suitable activities for the conduct of practical exercises on the following: - Managing the operation of the automatic control equipment and safety devices for main engine, generator and distribution system, and steam boiler - Carrying out Assessment and adjustment of the automatic control equipment and safety devices for main engine, generator and its distribution system, and steam boiler	Participating in the practical exercises in: - Managing the operation of the automatic control equipment and safety devices for main engine, generator and distribution system, and steam boiler - Carrying out assessment and adjustment of the automatic control equipment and safety devices for main engine, generator and its distribution system, and	 ERS Sample Operating manual
30 minutes	Conclusion	Design features and system configurations of automatic control equipment and safety devices for main engine, generator and distribution system, and steam boiler	 Make generalization and abstraction about the lesson Assess the learning which may come from any of the following: Formative test; Oral Examination; Assignment; 	 Participating, sharing insights and learning gained Answering/asking questions 	Visual presentation

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
			 Other activities to 		
			check the retention		
			of learning		

			Competence: Manage oper	ation of electrical and elect	ronic control equipment
			Knowledge, Understanding and Proficiency: Design features and system		
		configurations of operational control equipment for electrical motors			
	Officers (Functior		Topic:		
U U	,		•	system configurations of ope	erational control
			equipment for electric	al motors	
Lecture: T	wenty-Four (24)	Trainees	Learning Outcome/s: At the		
			Refer to Part C Course Sylla		ng Outcomes
Class Lay	out: Layout suita	able for the theoretical part	Formative Assessment: W	ritten and Practical Test	
Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
30 minutes	Introduction	 Design features and system configurations of automatic control equipment and safety devices for main engine, generator and distribution system, and steam boiler Intended Learning Outcomes (ILO) 	 Review of previous lessons Presentation of the Training Outcomes, Course Content, and ILOs 	Listening, note taking, inquiring, answering questions, interactive discussion	Visual presentation
7 hours	Core Elements	3. Design features and system configurations of operational control equipment for electrical motors	The MTI is required to specify suitable activities for the delivery of the topics.	Participating, note taking, sharing insights and learning gained, asking and answering questions	 Visual presentation; Training Videos; SOLAS Convention Sample operating manual
3 hours		Practical Exercise 4Manage the operational control equipment system for electrical motorsPractical Exercise:	Practical Exercises 4 and 5 The MTI is required to specify suitable activities for the conduct of practical exercises on the following:	Practical Exercises 4 and 5 Participating in the practical exercises in: - managing the operation of control equipment	 Exercise Sheet A4.4 and A4.5 Electrical and electronic trainer Sample operating manual

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
		Assess the performance level of control equipment system for electrical motors	 Managing the operational control equipment system for electrical motors Assessing the performance level of control equipment system for electrical motors 	system for electrical motors - assessing the performance level of control equipment system for electrical motors	
30 minutes	Conclusion	Design features and system configurations of operational control equipment for electrical motors	 Make generalization and abstraction about the lesson Assess the learning which may come from any of the following: Formative test; Oral Examination; Assignment; Other activities to check the retention of learning 	 Participating, sharing insights and learning gained Answering/asking questions 	Visual presentation

Course: Management Level Course for Marine Engineer Officers (Function 2)		Competence: Manage operation of electrical and electronic control equipment Knowledge, Understanding and Proficiency: Design features of high-voltage installation			
		12)	Topic:	h voltago installation	
Lecture: T	Lecture: Twenty-Four (24) Trainees		4. Design features of hig Learning Outcome/s: At the Refer to Part C Course Sylla	e end of the session, the tra	
Class Lay	out: Layout suita	able for the theoretical part	Formative Assessment: W		2
Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
10 minutes	Introduction	 Design features and system configurations of operational control equipment for electrical motors Intended Learning Outcomes (ILO) 	 Review of previous lessons Presentation of the Training Outcomes, Course Content, and ILOs 	Listening, note taking, inquiring, answering questions, interactive discussion	Visual presentation
2 hours and 40 minutes		4. Design features of high-voltage installation	The MTI is required to specify suitable activities for the delivery of the topics.	Participating, note taking, watching video clips, sharing insights and learning gained, asking and answering questions	 Visual presentation; SOLAS Convention; Training Videos; Sample operating manual
2 hours	Core Elements	Practical Exercise 6 Manage the operation of high-voltage installations	Practical Exercise 6 The MTI is required to specify suitable activities for the conduct of practical exercise in managing the operation of high-voltage installations	Practical Exercise 6 Participating in the practical exercise in managing the operation of high-voltage installations	 Exercise Sheet A4.6 Stand-alone High Voltage Simulator or ERS (capable of operating and maintaining power systems over 1,000 volts) Sample operating manual

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
10 minutes	Conclusion	Design features and system configurations of operational control equipment for electrical motors	 Make generalization and abstraction about the lesson Assess the learning which may come from any of the following: Formative test; Oral Examination; Assignment; Other activities to check the retention of learning 	 Participating, sharing insights and learning gained Answering/asking questions 	Visual presentation

Course: Management Level Course for Marine Engineer Officers (Function 2) Lecture: Twenty-Four (24) Trainees		Competence: Manage operation of electrical and electronic control equipment Knowledge, Understanding and Proficiency: Features of hydraulic and pneumatic control equipment Topic: 5. Features of hydraulic and pneumatic control equipment Learning Outcome/s: At the end of the session, the trainees should be able to: Refer to Part C Course Syllabus for the Intended Learning Outcomes			
Class Lay	out: Layout suita	able for the theoretical part	Formative Assessment: W		
Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
10 minutes	Introduction	 Design features and system configurations of operational control equipment for electrical motors Intended Learning Outcomes (ILO) 	 Review of previous lessons Presentation of the Training Outcomes, Course Content, and ILOs 	Listening, note taking, inquiring, answering questions, interactive discussion	Visual presentation
7 hours and 20 minutes	Core	5. Features of hydraulic and pneumatic control equipment	The MTI is required to specify suitable activities for the delivery of the topics.	Participating, sharing insights and learning gained, asking and answering questions	 Visual presentation Sample technical Specifications
	Elements	Practical Exercise 7 Manage the operation of hydraulic and pneumatic control equipment	Practical Exercises 7 and 8 The MTI is required to specify suitable activities for the conduct of practical	Practical Exercises 7 and 8 Participating in the practical exercises in: • managing the	 Exercise Sheet A4.7 and A4.8 Hydraulic and pneumatic trainer Sample technical
3 hours		Practical Exercise 8 Assess the performance level of hydraulic and pneumatic control equipment	 exercises on the following: Managing the operation of hydraulic and pneumatic control equipment Assessing the performance level of hydraulic and 	operation of hydraulic and pneumatic control equipment • assessing the performance level of hydraulic and pneumatic	specifications

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
			pneumatic control equipment	control equipment	
30 minutes	Conclusion	Features of hydraulic and pneumatic control equipment	 Make generalization and abstraction about the lesson Assess the learning which may come from any of the following: Formative test; Oral Examination; Assignment; Other activities to check the retention of learning 	 Participating, sharing insights and learning gained Answering/asking questions 	Visual presentation

			Competence: Manage troubleshooting, restoration of electrical and electronic control equipment to operating condition		
Course: Management Level Course for Marine		Knowledge, Understanding		eshooting of electrical and	
Engineer C	Officers (Functior	ר 2)	electronic control equipment		
			Topic:		
				ectrical and electronic contr	
Lecture: T	wenty-Four (24)	Trainees	Learning Outcome/s: At the Refer to Part C Course Sylla		
Class Lay	out: Layout suita	able for the theoretical part	Formative Assessment: W		2
Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
10 minutes	Introduction	 Features of hydraulic and pneumatic control equipment Intended Learning Outcomes (ILO) 	 Review of previous lessons Presentation of the Training Outcomes, Course Content, and ILOs 	Listening, note taking, inquiring, answering questions, interactive discussion	Visual presentation
2 hours and 40 minutes		6. Troubleshooting of electrical and electronic control equipment	The MTI is required to specify suitable activities for the delivery of the topics.	Participating, note taking, watching video clips, sharing insights and learning gained, asking and answering questions	 Visual presentation Training Videos
2 hours	Core Elements	Practical Exercise 9 Manage the inspection, troubleshooting, and restoration activities for electrical and electronic control equipment	Practical Exercise 9 The MTI is required to specify suitable activities for the conduct of practical exercises on the inspection, troubleshooting, and restoration activities for electrical and electronic control equipment	Practical Exercise 19 Participating in the practical exercise in managing the inspection, troubleshooting, and restoration activities for electrical and electronic control equipment	 Exercise Sheet A4.9; Electrical and electronic trainer Sample operating manual

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
10 minutes	Conclusion	Troubleshooting of electrical and electronic control equipment	 Make generalization and abstraction about the lesson Assess the learning which may come from any of the following: Formative test; Oral Examination; Assignment; Other activities to check the retention of learning 	 Participating, sharing insights and learning gained Answering/asking questions 	Visual presentation

			Competence: Manage trout	pleshooting restoration of el	ectrical and electronic
			Competence: Manage troubleshooting, restoration of electrical and electronic control equipment to operating condition		
Course: Management Level Course for Marine Engineer Officers (Function 2)		Knowledge, Understandin		n test of electrical,	
		electronic control equipment			
_	-		Topic:		
			7. Function test of electrical		
Lecture: T	Lecture: Twenty-Four (24) Trainees		Learning Outcome/s: At the end of the session, the trainees should be able to: Refer to Part C Course Syllabus for the Intended Learning Outcomes		
Class Lay	out: Layout suita	able for the theoretical part	Formative Assessment: W		ig outcomed
Time Phase Content		Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used	
10 minutes	Introduction	 Troubleshooting of electrical and electronic control equipment Intended Learning Outcomes (ILO) 	 Review of previous lessons Presentation of the Training Outcomes, Course Content, and ILOs 	Listening, note taking, inquiring, answering questions, interactive discussion	Visual presentation
2 hours and 40 minutes		7. Function test of electrical, electronic control equipment and safety devices	The MTI is required to specify suitable activities for the delivery of the topics.	Participating, sharing insights and learning gained, asking and answering questions	 Visual presentation; Training Videos; Sample operating manual
2 hours	Core Elements	Practical Exercise 10 Manage the function test of electrical, electronic control equipment and safety devices	Practical Exercise 10 The MTI is required to specify suitable activities for the conduct of practical exercises in managing the function test of electrical, electronic control equipment and safety devices	Practical Exercise 10 Participating in the practical exercise in managing the function test of electrical, electronic control equipment and safety devices	 Exercise Sheet A4.10 Electrical and electronic trainer Sample operating manual

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
10 minutes	Conclusion	Function test of electrical, electronic control equipment and safety devices	 Make generalization and abstraction about the lesson Assess the learning which may come from any of the following: Formative test; Oral Examination; Assignment; Other activities to check the retention of learning 	 Participating, sharing insights and learning gained Answering/asking questions 	Visual presentation

					_	
Course: Management Level Course for Marine Engineer Officers (Function 2)			Competence: Manage troubleshooting, restoration of electrical and electronic control equipment to operating condition			
			Knowledge, Understanding	0	eshooting of monitoring	
			systems		5 5	
-		-	Topic:			
			8. Troubleshooting of mo	onitoring systems		
	wenty-Four (24)	Trainaga	Learning Outcome/s: At the	Learning Outcome/s: At the end of the session, the trainees should be able to:		
Lecture.	wenty-Four (24)	Trainees	Refer to Part C Course Sylla	bus for the Intended Learn	ing Outcomes	
Class Lay	out: Layout suita	able for the theoretical part	Formative Assessment: W	ritten and Practical Test		
Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used	
		Function test of	Review of previous	Listening, note taking,	Visual presentation	
		electrical, electronic	lessons	inquiring, answering		
10		control equipment and	Presentation of the	questions, interactive		
minutes	Introduction	safety devices	Training Outcomes,	discussion		
		Intended Learning	Course Content, and			
		Outcomes (ILO)	ILOs			
		8. Troubleshooting of	The MTI is required to	Participating, sharing	Visual presentation	
3 hours		monitoring systems	specify suitable activities	insights and learning		
and 40			for the delivery of the	gained, asking and answering questions		
minutes			topics.			
minutes	Core	Practical Exercise 11	Practical Exercise 11	Practical Exercise 11	Exercise Sheet	
	Elements	Manage the	The MTI is required to	Participating in the	A4.11	
		troubleshooting activities	specify suitable activities	practical exercise in	Troubleshooting	
		in monitoring systems	for the conduct of practical	managing the	guide	
2 hours		(Table-top)	exercises in managing the	troubleshooting		
			troubleshooting activities in	activities in monitoring		
			monitoring systems	systems		
		Troubleshooting of	Make generalization	 Participating, sharing 	Visual presentation	
monitoring systems			and abstraction	insights and learning		
10 Conclusion			about the lesson	gained		
minutes			 Assess the learning 	 Answering/asking 		
			which may come	questions		

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
			from any of the following: - Formative test; - Oral Examination; - Assignment; • Other activities to check the retention of learning		

Courses Management Louis Courses for Maria			Competence: Manage troubleshooting, restoration of electrical and electronic control equipment to operating conditionKnowledge, Understanding and Proficiency: Software version control		
Course: Management Level Course for Marine Engineer Officers (Function 2)					
Lingineer	Engineer Officers (Function 2)		Topic: 9. Software version control		
Lecture: T	Lecture: Twenty-Four (24) Trainees		Learning Outcome/s: At the end of the session, the trainees should be able to: Refer to Part C Course Syllabus for the Intended Learning Outcomes		
Class Laye	out: Layout suita	able for the theoretical part	Formative Assessment: W	ritten and Practical Test	
Time			Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
10 minutes	Introduction	 Troubleshooting of monitoring systems Intended Learning Outcomes (ILO) 	 Review of previous lessons Presentation of the Training Outcomes, Course Content, and ILOs 	Listening, note taking, inquiring, answering questions, interactive discussion	Visual presentation
2 hours and 40 minutes		9. Software version control	The MTI is required to specify suitable activities for the delivery of the topics.	Participating, note taking, watching video clips, sharing insights and learning gained, asking and answering questions	 Visual presentation Training Videos Sample operating manual
2 hours	Core Elements	Practical Exercises 12 and 13 Plan the maintenance and supervise the maintenance and installation activities for updated software version	Practical Exercises 12 and 13 The MTI is required to specify suitable activities for the conduct of practical exercises on maintenance and installation activities for updated software version	Practical Exercises 12 and 13 Participating in the practical exercise in supervising the maintenance and installation activities for updated software version	 Exercise Sheet A4.12 and A4.13 Sample operating manual; ERS

Time	Phase	Content	Instructor-led Activity	Trainee's Learning Activity	Instructional Materials Used
10 minutes	Conclusion	Software version control	 Make generalization and abstraction about the lesson Assess the learning which may come from any of the following: Formative test; Oral Examination; Assignment; Other activities to check the retention of learning 	 Participating, sharing insights and learning gained Answering/asking questions 	Visual presentation