Exercise Plan Template
(Instructor's Copy)

Course Title	**Management Level Course for Marine Deck Officers (Function 3)**
Exercise No.	Practical Exercise No. A6.1
Exercise Title	Performing damage stability criteria and calculations on the assessment of the ship's response to damage and flooding
Duration	2.0 hours
Function	Controlling the Operation of the Ship and Care for Persons on Board at the Management Level
Competence	Control trim, stability, and stress
Knowledge, Understanding and proficiency	Understanding of fundamental principles of ship construction and the theories and factors affecting trim and stability and measures necessary to preserve trim and stability Knowledge of the effect on trim and stability of a ship in the event of damage to and consequent flooding of a compartment and countermeasures to be taken Knowledge of IMO recommendations concerning ship stability
Intended Learning Outcome/s	At the end of the exercises, the trainee should be able to perform damage stability criteria and calculations on the assessment of the ship's response to damage and flooding
Training Equipment	N/A
Scenario Description	While en route to Los Angeles, MV Sea Guardian collides with a submerged object, resulting in the following damage: Location of Damage: • Port side, amidships, from Frame 60 to Frame 70 Extent of Damage: • 10-meter longitudinal rupture, 1.5 meters high from the keel Compartments Affected: • Cargo Hold 3 and Ballast Tank 2
Initial Condition	**Ship Particulars** **Ship Name**: MV Sea Guardian **Type**: Container Ship **IMO Number**: 9876543 **Flag**: Panama **Gross Tonnage**: 50,000 GT

	Length Overall (LOA): 300 meters **Beam**: 48 meters **Depth**: 24 meters **Draft**: 13 meters **Deadweight Tonnage (DWT)**: 80,000 MT **Built Year**: 2015 **Classification Society**: ABS **Initial Conditions** **Voyage**: Hong Kong to Los Angeles **Cargo**: 6,000 TEUs (Twenty-foot Equivalent Units) **Ballast**: 15,000 MT **Fuel**: 2,500 MT **Fresh Water**: 1,000 MT **Speed**: 18 knots **Weather Conditions**: Moderate seas with waves up to 2 meters, wind speed 15 knots from the northeast
Instructor's Action	The instructor should follow these steps for the entire duration of the exercise to ensure the effective and safe conduct of the practical exercise: • Conduct briefing • Start the practical exercise • Monitor the trainees' performance using the attached checklist • Remind the trainee of the time left and actions not related to the exercise; • Stop the exercise if there is any deviation from the required procedure, then explain the reason and give further instructions • Conduct debriefing
Exercise Procedure	
Briefing	Before the start of the exercise, ensure that the following are fully understood by the trainees: • The measures to be observed during the execution of the exercise • The specified intended learning outcomes and execution of the performance criteria of the exercise; • The attitude, as a management level officer to be shown by the trainee during practical exercises • The need to treat the activity as it is a real-life situation; • The best management practices applicable; and • The monitoring and assessment to be conducted during and after the completion of exercise; • Seek clarifications and concerns regarding the instructions given prior commencing the simulation exercise
Trainee's Action	Perform damage stability criteria and calculations on the assessment of the ship's response to damage and flooding: • Calculate the initial stability of the vessel before the damage

	• Verify the ship's hydrostatic properties (GM, GZ curve) based on the loading condition • Identify the compartments affected by the damage • Determine the extent of flooding in the damaged compartments • Calculate the ingress of water into Cargo Hold 3 and Ballast Tank 2 • Determine the new draughts (forward, aft, and mean) after flooding • Calculate the new metacentric height (GM) and righting arm (GZ) curve post-damage • Develop an emergency response plan, including measures to restore stability • Consider options such as ballasting, cargo shifting, and pumping out flooded compartments
Debriefing	Start the debriefing by stating the purpose of the debriefing and encourage peer review and discussions then: • discuss the essentials of knowing the "state of seaworthiness" of the ship at all times, especially during emergencies; • class interactive participation is graded by a RUBRIC ask the trainees how they went about the exercise and what challenges they encountered; • state whether the intended learning outcomes were achieved; • provide the result of the exercise using the checklist provided based on the criteria for assessing the competence; and • discuss the positive accomplishment as well as the points for improvements if any. • Always be diplomatic in any objection of the trainee and take note of the comment regarding the exercise

Monitoring Checklist

Trainees should be required to repeat the execution if any of the performance criteria is not done or not acceptable

Performance Criteria	Done	Not Done	Observations / Comments
Perform Damage Stability Criteria and Calculations			
1. Assessment of Initial Stability			
1.1 Calculate the initial stability of the vessel before the damage			
1.2 Verify the ship's hydrostatic properties (GM, GZ curve) based on the loading condition			
2. Damage Assessment			
2.1 Identify the compartments affected by the damage			

2.2. Determine the extent of flooding in the damaged compartments			
3. Flooding Calculation			
3.1. Calculate the ingress of water into Cargo Hold 3 and Ballast Tank 2			
3.2. Determine the new draughts (forward, aft, and mean) after flooding			
3.3. Calculate the new metacentric height (GM) and righting arm (GZ) curve post-damage			
4. Response to damage and flooding			
4.1. Develop an emergency response plan, including measures to restore stability			
4.2. Consider options such as ballasting, cargo shifting, and pumping out flooded compartments			

Note: This sample practical Exercise Sheet was used during the conduct of pilot testing, MTI may enhance this by taking into account the resources they have.