

RANGER CLASS SCORE SHEET
The Role of ROVs in Exploring WWII Shipwrecks

SCHOOL NAME and # AS IT APPEARS ON THE OFFICIAL LIST: _____

Company CEO: _____ Mission attempt #: _____

Mission station officials: _____

Set-Up and Safety Check

- All power cords, power bars, pressurized cylinders, etc. are secured.
- A fuse is present in the vehicle's electrical system.
- No hazardous materials are leaking onto the pool deck.
- Vehicle is hand-launched by team members in a safe manner.
- No team member has entered the water in order to prepare and/or launch vehicle.
- Vehicle is in the water near the control shack at the end of the 5-minute set-up period.

Mission official's notes: _____

- Company is ready for the mission:** _____ (official's initials)

Note: An official's decision to disqualify a company due to safety concerns is final. If there is a safety concern, please contact the lead official or competition coordinator.

Fuses:

If a vehicle blows the MATE power supply in-line fuse, the company is allowed one spare. If the vehicle blows the second MATE fuse, the mission performance period is over. The company will receive points for the mission tasks that they have completed up to that point but will not receive a time bonus score.

Mission task scoring breakdown:

- Task #1: Survey the shipwreck site (120 points)**
- Task #2: Remove fuel oil from the shipwreck (180 points)**

Task #1: Survey the shipwreck site (120 points)

Scoring – 120 points

- **up to 20 points** – measuring the overall length of the wreck _____
 - ≤ 5 cm off true length – 20 points
 - 5 cm to 30 cm off true length – 10 points
 - > 30 cm off true length – 0 points

- **up to 20 points** – determining the orientation of the ship on the seafloor _____
 - ≤ 10° off true orientation – 20 points
 - > 10° to 20° off true orientation – 10 points
 - > 20° off true orientation – 0 points

- **up to 25 points** – creating a map of the wreck site that includes:
 - Sketch of the shipwreck – 5 points _____
 - Length of the shipwreck – 5 points _____
 - Orientation of the shipwreck – 5 points _____
 - Location of debris piles – 10 points for placing **all** 5 debris piles _____
in the correct grid squares

- **up to 25 points** – determining if the five debris piles are metal or non-metal _____
 - 5 points for each debris pile correctly identified

- **up to 30 points** – correctly “scanning” the ship at two target locations _____
 - 15 points for each target correctly scanned

TOTAL POINTS FOR TASK #1 _____

Task #2: Remove fuel oil from the shipwreck (180 points)

Scoring – 180 points

- **10 points** – transporting and attaching a lift bag to the U-bolt on a fallen mast _____

- **20 points** – inflating the lift bag so the mast ascends to the surface _____

- **up to 10 points** – removing endangered corals from the hull _____
 - 5 points for each coral removed

- **up to 20 points** – transplanting the corals to an unoccupied square within the grid _____
 - 10 points for each coral moved

- **up to 30 points** – determining if fuel oil remains inside the fuel tank
 - Placing the ultrasonic thickness gauge sensor on hull – 10 points _____
 - “Calibrating” the neutron backscatter device by placing it on the calibration tank – 10 points _____
 - Placing the neutron backscatter device on the hull – 10 points _____

- **30 points** – Simulating drilling a hole into the fuel tank by penetrating a layer of petroleum jelly and removing a sample of fuel oil from within the fuel tank so that it is in possession of your ROV and no longer in the container _____

- **20 points** – resealing the drill hole with a simulated magnetic patch _____

- **up to 40 points** – returning a volume of sample to the surface side of the pool so that a member of your company can retrieve the sample _____
 - > 100ml – 40 points
 - 50 – 99 ml – 20 points
 - 25 – 49 ml – 10 points
 - < 25 ml – 0 points

Penalty points:

- **-5 points** for returning a diluted sample _____

5 points deducted for returning a diluted sample (i.e., a sample that is lighter in color when compared to the standard).

TOTAL POINTS FOR TASK #2 _____

See below for SCORING SUMMARY WORKSHEET

Task #1: Survey the shipwreck site			
Measuring the overall length of the wreck	0	10	20
Determining the orientation of the ship on the seafloor	0	10	20
Creating a map of the wreck site	0	5	10 15 20 25
Determining if debris piles are metal or non-metal	0	5	10 15 20 25
Correctly "scanning" the ship at two target locations	0	15	30
Task #1 point total:			
Task #2: Removing fuel oil from the shipwreck			
Transporting and attaching a lift bag to the U-bolt on a fallen mast	0		10
Inflating the lift bag so the mast ascends to the surface	0		20
Remove endangered corals from the hull	0	5	10
Transplanting the corals to an unoccupied square within the grid	0	10	20
Place the ultrasonic thickness gauge sensor on hull	0		10
"Calibrating" the neutron backscatter device by placing it on the calibration tank	0		10
Placing the neutron backscatter device on the hull	0		10
Remove a sample of fuel oil from within the fuel tank	0		30
Resealing the drill hole with a simulated magnetic patch	0		20
Returning a volume of sample	0	10	20 40
Diluted sample			-5
Task #2 point total:			
PENALTY POINT DEDUCTIONS			
*Illegally pulling tether _____ infractions X - 5			
*Illegal communication _____ infractions X - 5			
**Diver assistance _____ infractions X - 5			
Exceeded 5-minute demobilization period _____ minutes X - 1 =			
TIME BONUS			
1 point for every minute and 0.01 point for every second under 15 minutes			
Duration of Mission: _____			
Minutes under 15 remaining: _____ X 1 point = _____			
Seconds remaining: _____ X 0.01 point = _____			
Time bonus			
TOTAL MISSION SCORE			

* Issue a warning for the first infraction. Begin deducting points AFTER the first infraction.

**Diver assistance is provided ONLY AFTER a company requests it. The only exception is once the mission time has ended. At this time the divers will assist the ROV to the surface as part of the company's 5-minute demobilization period. Companies WILL receive penalty points for diver assistance during the demobilization period. Also, companies that leave debris (e.g. parts of their ROV) on the pool bottom such that a diver must retrieve the debris will also receive penalty points.

Mission official's initials: _____ **Company CEO's initials:** _____