

EXPLORER CLASS: RESCUE MISSION ON THE EPR

School/Team: _____ Mission attempt #: _____
Team captain: _____
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: _____

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

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

Fuses

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

Task #1: Free one OBS from the seafloor.

Task #2: Collect up to 3 samples of lava.

Task #3: Measure the temperature of the hydrothermal vent fluid.

Task #1: Free one OBS from the seafloor.

This task involves:

- **Removing pieces of lava from the OBS.**
- **Freeing the OBS so that it floats to and breaks the water surface.**

Teams must free the OBS using their ROV. Their ROVs is not required to remove all the lava pieces from the OBS, but it will need to remove enough pieces to free the instrument.

NOTE: Teams are NOT permitted to use their ROVs to attach a line to the OBS and free the instrument by pulling on the line by hand. They can hook or otherwise attach to the OBS with their ROVs and use their ROVs' thrust or buoyant force to free the instrument, but teams are not permitted to pull on the tether to free the OBS once their ROVs have attached to it.

Scoring – 60 points (NO partial points will be awarded)

OBS floats to and breaks the water surface (60 points) _____

Task #2: Collect up to 3 samples of lava.

This task involves:

- **Collecting up to 3 samples of lava.**
- **Returning the samples of lava to the surface.**

Scoring – up to 60 points

- 10 points – for each sample of lava (up to 3) collected so that it is under the control of the team’s ROV and no longer in contact with the bottom.
- 10 points – for each sample of lava (up to 3) returned to the surface under the control of the team’s ROV so that one team member can retrieve the sample from the vehicle.

_____ # of samples under the control of the vehicle x 10 points = _____
_____ # of samples returned to the surface x 10 points = _____

Task #3: Measure the temperature of the hydrothermal vent fluid.

This task involves:

- **Locating the vent.**
- **Inserting a temperature sensor into the venting fluid.**
- **Measuring the temperature of the venting fluid and displaying the reading on a video monitor or as a digital readout at the control shack.**

NOTE: The judge(s) should be able to see the temperature reading on the teams’ ROV video monitor or as a digital readout at the control shack. The readout can be a separate device or integrated into the teams’ ROV control system. Teams are responsible for informing the judge(s) when they are preparing to take a reading and when they are ready to have their measurement scored. The judge(s) will confirm the measurement on the mission score sheet and assign a score based on the accuracy of the temperature measurement compared to the readout on the judges’ temperature gauge (called the benchmark).

Scoring – 80 points

ROV’s temperature sensor in the vent flow (10 points) _____
ANY temperature reading or temperature gauge movement (10 points) _____

Temperature reading within $\pm 3.0^{\circ}\text{C}$ of benchmark (60 points) _____
Temperature reading within $\pm 4.0^{\circ}\text{C}$ of benchmark (40 points) _____
Temperature reading within $\pm 5.0^{\circ}\text{C}$ of benchmark (20 points) _____

MISSION POINT TOTALS		
Task #1: Free one OBS from the seafloor		
OBS floats to and breaks the water surface		0 60
Task #2: Collect up to 3 samples of lava.		
# of samples under the control of the vehicle		0 10 20 30
# of samples returned to the surface		0 10 20 30
Task #3: Measure the temperature of the hydrothermal vent fluid.		
ROV's temperature sensor in the vent flow		0 10
ANY temperature reading or temperature gauge movement		0 10
Temperature reading		0 20 40 60
Mission Score		
PENALTY POINT DEDUCTION		
Illegally pulling tether* _____ infractions X -5		
Illegal communication* _____ 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.

Mission official's initials: _____ **Team captain's initials:** _____