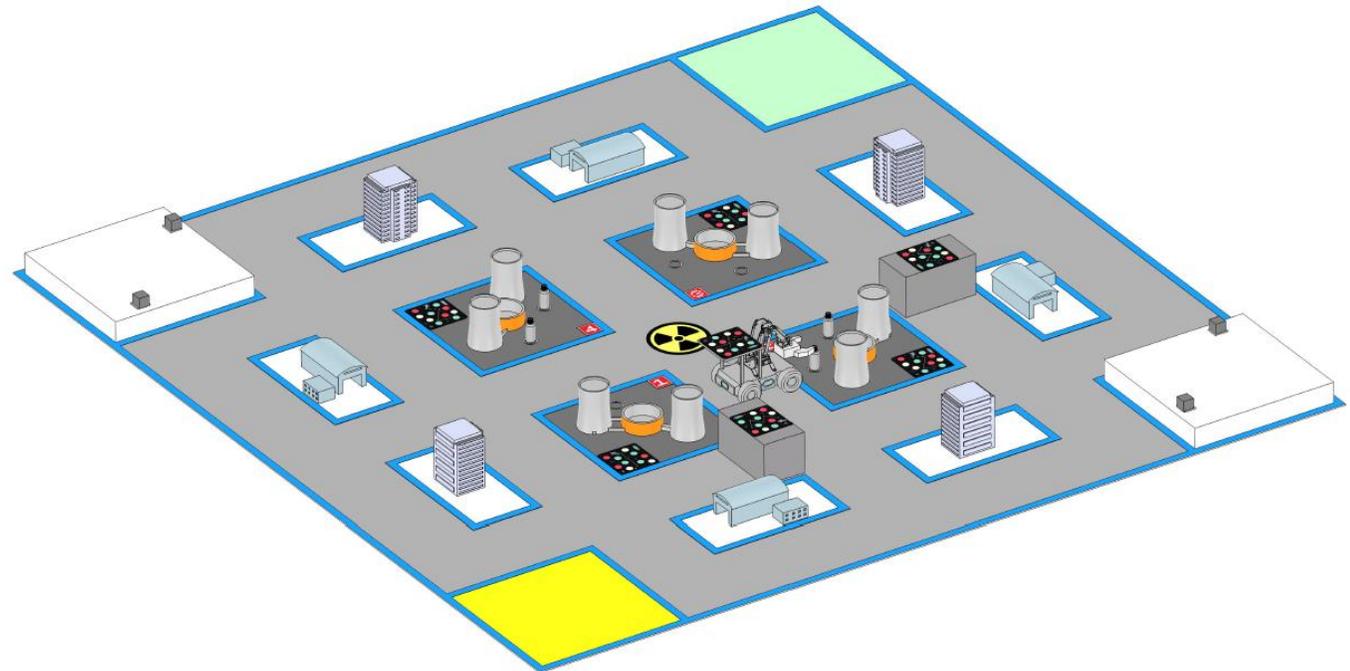


RoboMaster EP Core Competition Database

Air-to-Ground Cooperation

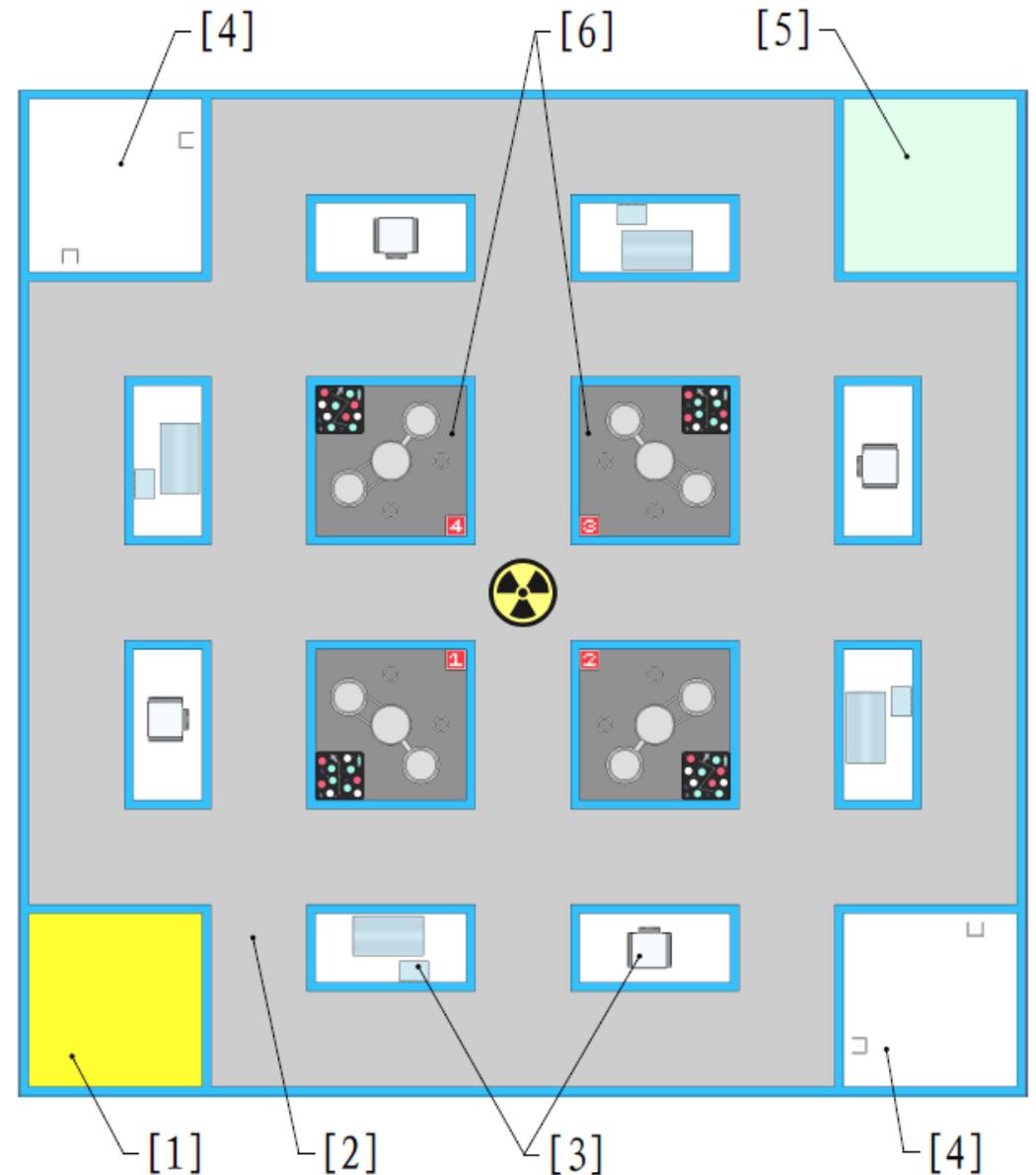
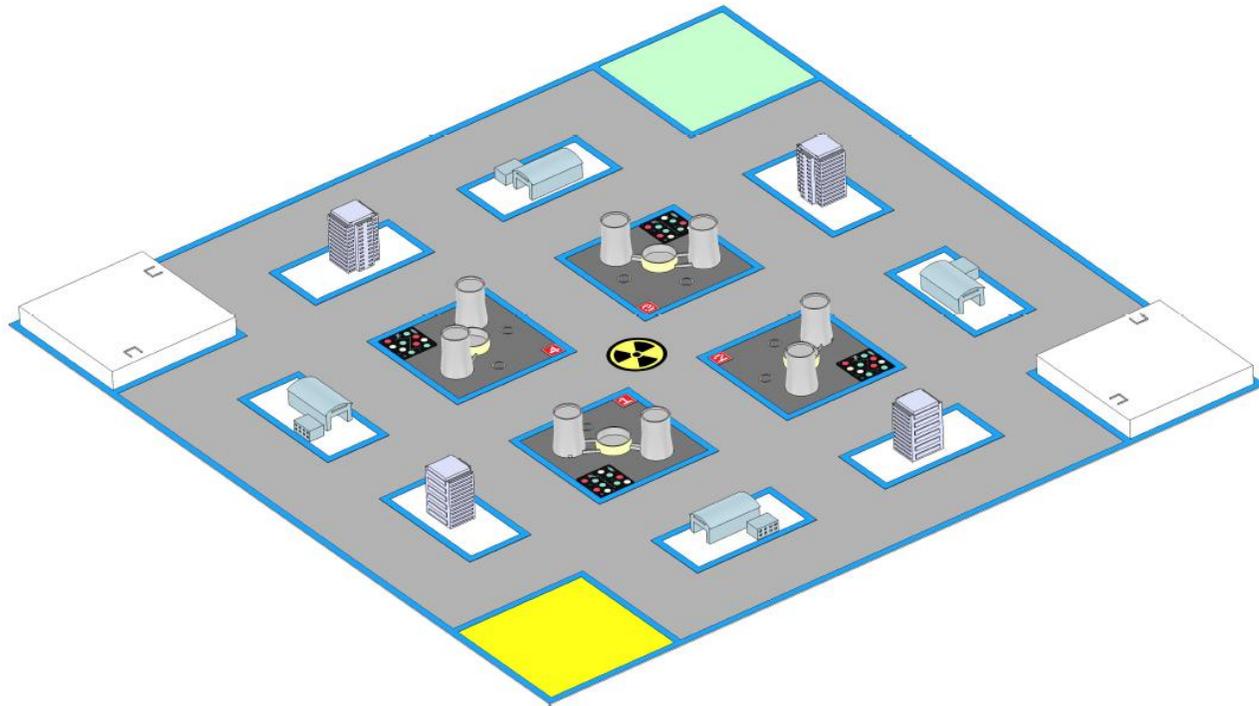
Mission Overview

- An accident occurs at a nuclear power plant resulting in a leak.
 A drone and an unmanned vehicle are sent to complete rescue tasks:
- The drone is responsible for aerial reconnaissance.
 - The unmanned vehicle is responsible for transferring nuclear waste and repairing the nuclear power plant.



Competition Area

The competition area is a 4x4-meter square.



[1] Base

[2] Road

[3] Surrounding buildings

[4] Warehouses

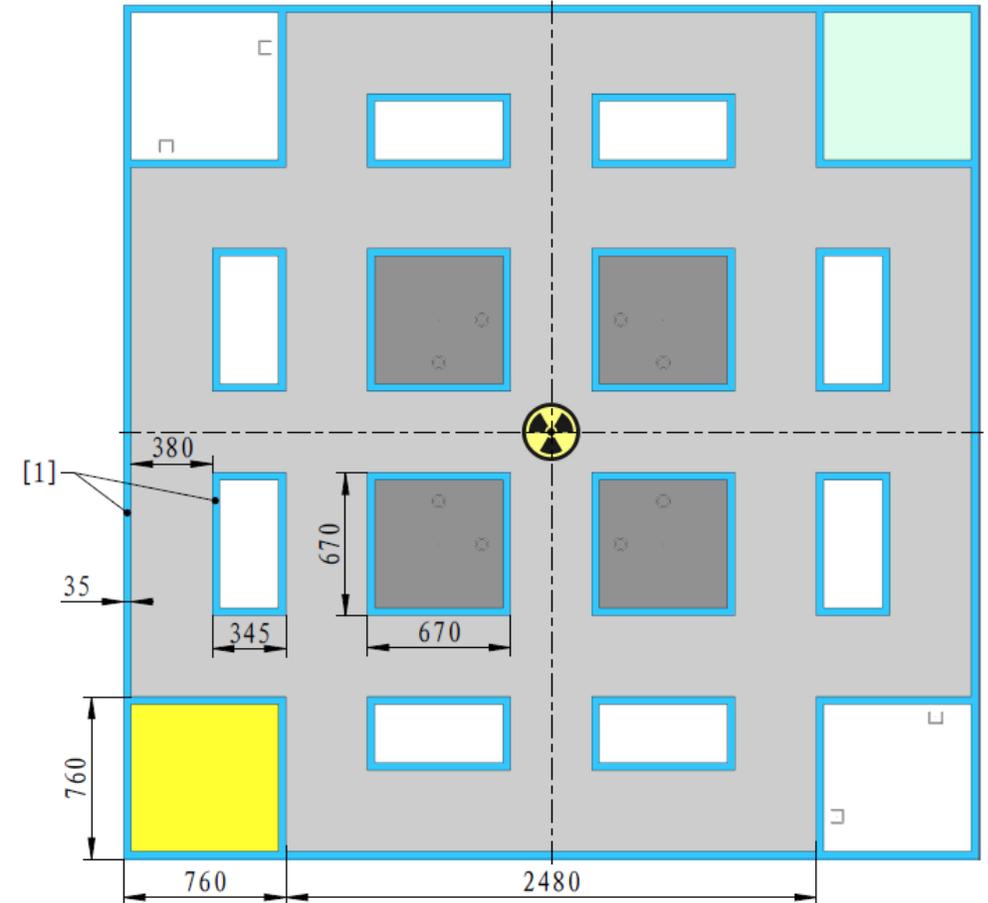
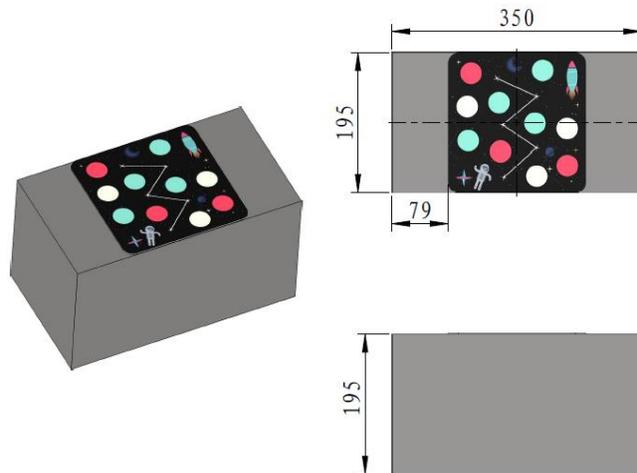
[5] Disposal site

[6] Nuclear reactors

Road

Road: This is the main area for the unmanned vehicle to move and there are blue guidelines along all of the road edges.

The road around the nuclear power plant may become impassable (barriers are placed).

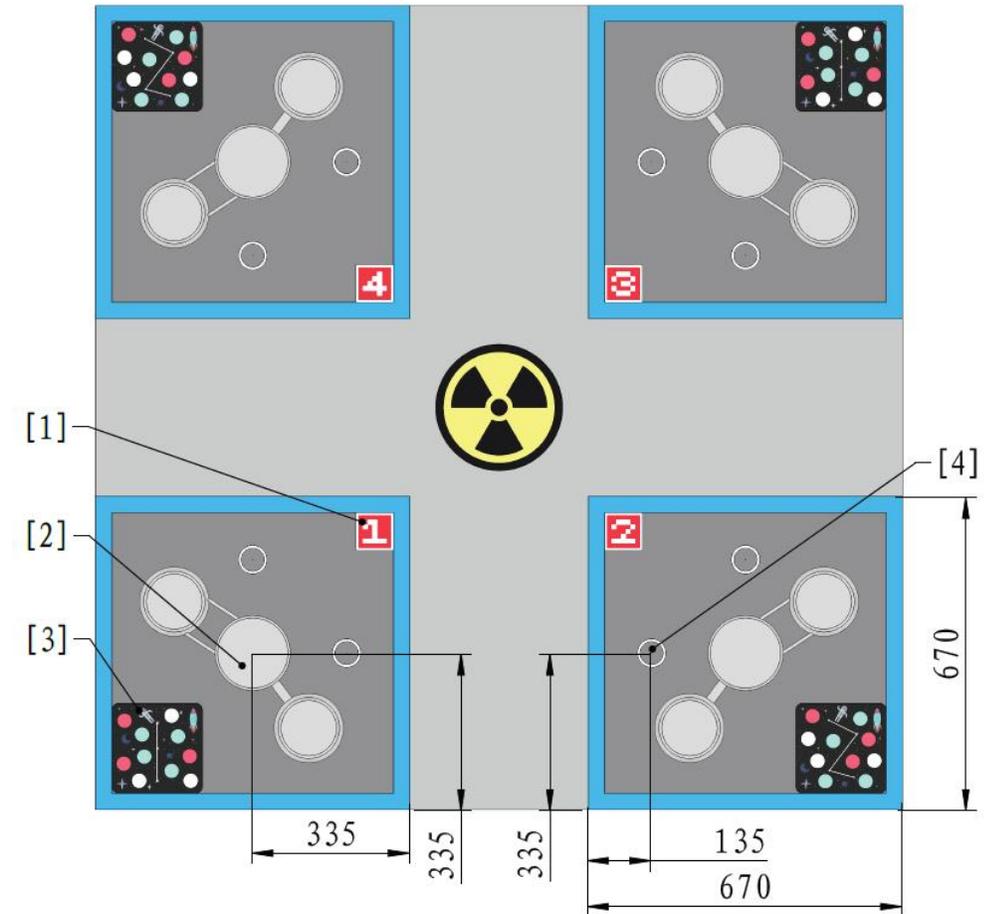
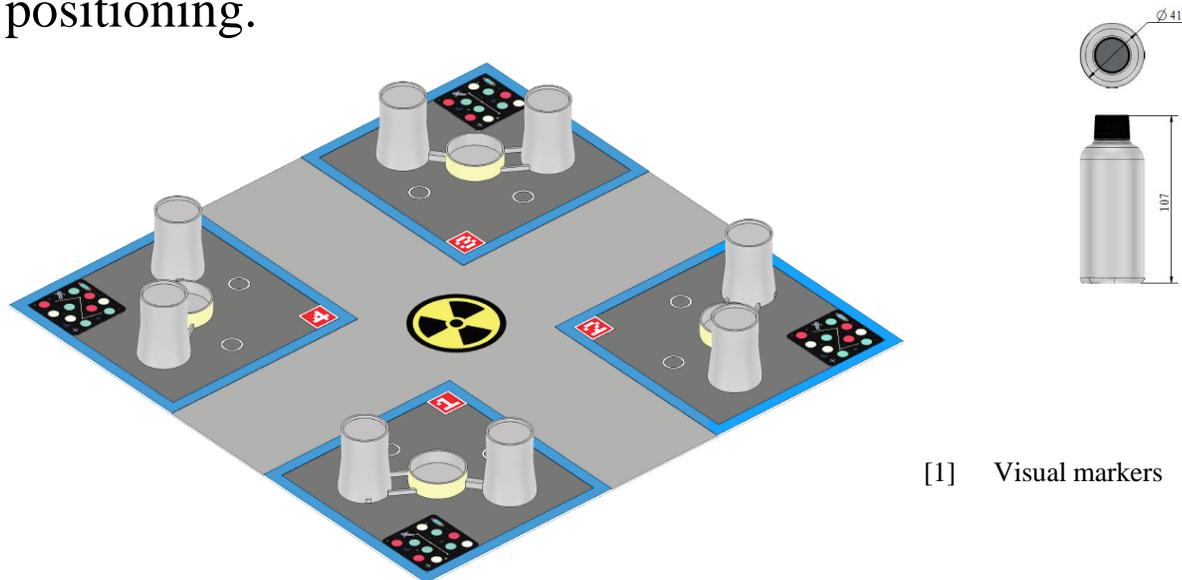


Nuclear Reactor

The nuclear reactor is located in the center of the competition area and is divided into four areas (numbered 1-4, as seen in the reference image).

Visual marker: Used for unmanned vehicle identification and positioning.

Challenge card: Used for drone identification and positioning.



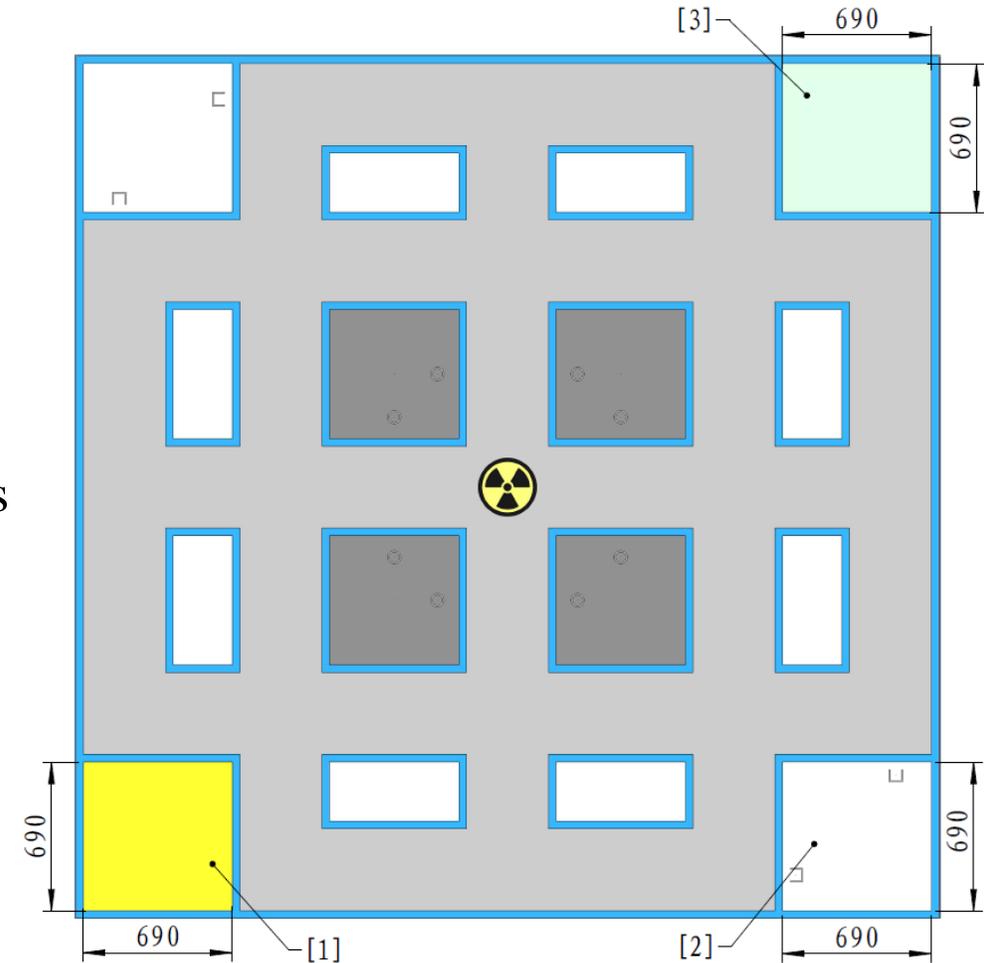
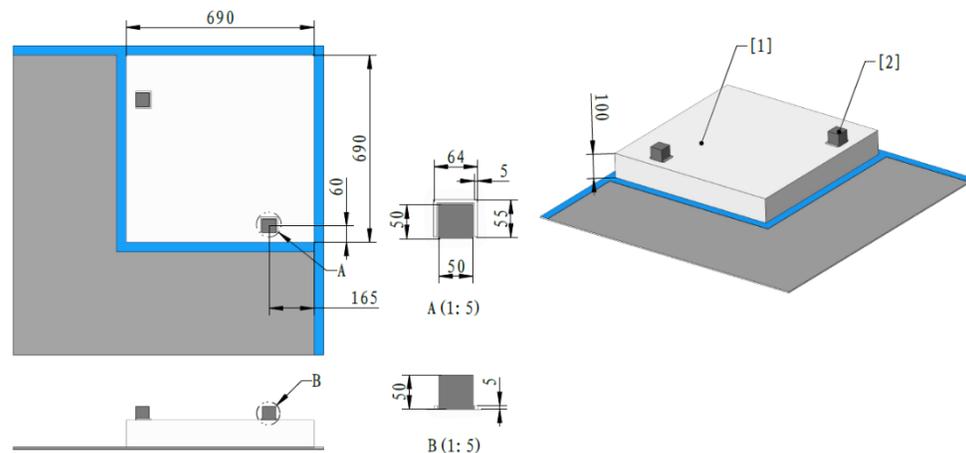
[1] Visual markers [2] Nuclear reactors [3] Challenge cards [4] Nuclear waste container location

Functional Areas

Base: Located in the lower-left corner of the competition area, the base is where robots depart from and return to during tasks.

Disposal site: Located in the upper-right corner of the competition area, this is where the unmanned vehicle must transfer nuclear waste.

Warehouses: Located in the upper-left and lower-right corners of the competition area, these are where emergency repair materials are placed.



[1] Base [2] Warehouses [3] Disposal site

Task Description

The competition consists of four tasks: aerial reconnaissance, nuclear waste transfer, nuclear power plant repair, and coordinated landing.

1. The drone departs to the nuclear power plant and surrounding area for reconnaissance and sends the information back to the unmanned vehicle;

[The unmanned vehicle must then go to the nuclear reactor where the nuclear leakage has occurred to carry out emergency rescue tasks, which include the following.]

2. Transferring nuclear waste from the nuclear reactor to the disposal site;

3. Carrying concrete from the warehouse and putting it inside the nuclear reactor where the accident has occurred;

4. To end the mission, once all of the tasks mentioned above have been completed, the drone must land on top of the unmanned vehicle and both robots must return to the base.

Timing & Scoring Rules

Each round is limited to three minutes.

The full score for the completed mission is 100 points.

The mission time of the participating teams will be recorded. In the event that two teams have a tied score, the ranking will be based on recorded time, with the fastest team being rewarded.

No.	Task	Specific Task	Score
1	Aerial Reconnaissance	The drone flies over four areas of the nuclear power plant in order.	5
2		The drone hovers above the reactor where leakage has occurred.	5 each
3		The unmanned vehicle communicates the number of nuclear reactors with nuclear leakage through lights flashes.	5 each
4	Automatic Line Patrol	The unmanned vehicle navigates within the guidelines to the nuclear power plant park.	5
5	Transferring the Nuclear Waste Container	The unmanned vehicle lifts the nuclear waste containers.	5 each
6		Transferring the nuclear waste containers.	10 each
7	Repairing the Nuclear Power Plant	The unmanned vehicle lifts the concrete.	5 each
8		Placing concrete in the reactor where the nuclear leak occurred.	10 each
9	Landing	The drone lands on the landing pad on top of the unmanned vehicle.	5
10		The drone and the unmanned vehicle return to the base together.	5
11	Score Deduction Caused by Violation	The unmanned vehicle drives off the road for more than five seconds.	-5 each time
		The unmanned vehicle rams into the barrier block.	-10 each
		The unmanned vehicle knocks down a nuclear waste container.	-10 each

Warnings

Before the competition begins, the robots need to be placed in the base.

Once the competition begins, the team cannot touch the robots. Otherwise, the robots will need to be moved back to the base.

Remote control of the robots by wire or radio is not allowed.

You may not borrow another team's robots for a match.

Equipment

Recommended competition equipment:

Tello EDU

(Buy Now: <https://store.dji.com/product/tello-edu?vid=47091>)



RoboMaster EP Core

(Buy Now: <https://www.dji.com/robomaster-ep-core>)



Battlefield components list:

Material name	Quantity	Application
Blue tape	-	Guiding line
Visual markers	Numbered 1-4, one marker for each number	Unmanned vehicle recognition
Challenge cards	Numbered 1-3, two cards for each number	Drone recognition
Cylinders	4	Nuclear reactor model
Projectile containers	2	Nuclear waste containers
Platforms	2	Warehouses
Cubes	4	Concrete models
Barrier blocks	2	Barriers
Building models	8	Decoration

Reference Materials (Released Soon)

- Rules manual;
- Documentation for interpretation of the rules;
- Sample code (automatic claw operation and air-to-land communication);
- Task demonstration video (automatic claw operation and air-to-land communication).