

# Harsh Environment Drone Challenge (HEDC)

## Section 1 Application Guidelines

- Application guidelines consist of Section 1: Application Guidelines and Section 2: Mission Scenario and Evaluation Criteria (separate sheet).
- Please read all sections carefully before submitting your application

15 January 2025

Secretariat of WRS2025  
Harsh Environment F-REI Challenge

## **1. Name**

Name of the Challenge: Harsh Environment Drone Challenge (HEDC)

The Fukushima Institute for Research, Education and Innovation (F-REI) hosts the “World Robot Summit (WRS) 2025 Harsh Environment F-REI Challenge” . The HEDC is one of the competitions of “WRS 2025 Harsh Environment F-REI Challenge” held in October 2025, at the Fukushima Robot Test Field.

## **2. Goal of HEDC**

F-REI’s Robotics Research related to Robots & Drones is based on a policy of creating “research and development of robots and drones that can function in the harsh environments that occur during decommissioning, recovery work and natural disasters.” F-REI’s strategy for setting up research topics is to “develop highly mobile robots that are resistant to radiation, water, heat and etc., intelligence research to achieve autonomous operation and swarm control etc., and research on functional enhancements to improve the sensory functions of the living organisms.

The results of this research will be used to develop highly mobile robots that can operate in harsh environments such as decommissioning, disaster sites, and outer space, to develop highly functional drones that can fly for long periods with high payloads, and to develop autonomous mobile robots.

From the above perspective, the HEDC will be held as one of the competitions of the “WRS2025 Harsh Environment F-REI Challenge” organized by F-REI. The WRS2025 Harsh Environment F-REI Challenge consists of four Challenges: “Harsh Environment Drone Challenge” , “Plant Disaster Challenge” , “Simulation Disaster Challenge” and “Standard Disaster Robotics Drone Challenge.” Robots and drones researchers and engineers will gather from all over the world and compete their technologies in each Challenge.

## **3. Target Fields for HEDC**

The competition target field related to next-generation robotics, particularly in the field of harsh environment robotics in which flying robots/drones are the main focus.

## **4. Details of HEDC**

The scenario assumes a large-scale earthquake has occurred, roads have been cut

off, and houses have collapsed or are in danger of collapsing. Under these circumstances, disaster victims are waiting for rapid rescue. HEDC assumes this life-or-death situation and teams compete to create the life-saving proposal using advanced robot technology. In particular, the competition emphasizes realistic scenario at a site of a large-scale earthquake where ground vehicles and ships were completely unusable due to ground cracks and coastal disturbance. So, the competition will focus on the only remaining approach from the sky using flying robots and drones. For details, see Section 2 “HEDC Mission Scenario and Evaluation Criteria” (attached) and “Permitted Flight Path” (attached).

## 5. Qualifications to Participate

Participation is open to universities, companies, private, or government organizations, either as teams or individuals.

Note: Individuals cannot enter as a member of multiple teams.

## 6. Compliance

HEDC participants must comply with Japan’s Civil Aeronautics Act and Radio Regulations. For details, see the Japanese Civil Aeronautics Act Compliance Required for UAV Flights (attached) and the Japanese Radio Regulations for UAV Operations (attached).

## 7. Overall Process and Schedule for this Challenge

The overall process and schedule are as follows. Any changes will be published on the WRS website (<https://worldrobotsummit.org/en/>).

Overall Process	Schedule (provisional)	Notes
Open for public applications to HEDC	15 January 2025 (Wed)	
Webinar about HEDC and Japanese Act	Early March 2025	Date will be announced soon online
Application deadline	12 May 2025 (Mon)	
Publication of entry teams	Late May 2025	
Document review and additional video review (if necessary)	If necessary	Document and additional video review may be carried out on an as-

		needed basis.
Permit applications for a specified flight	June to October (Flight applications to the Civil Aviation Bureau will be handled by the HEDC Secretariat.)	Please note that passing the document and video reviews does not necessarily guarantee the flight permission from Japanese Civil Aviation Bureau.
Aircraft inspection and flight review before HEDC competition	4 October (Sat) to 9 October (Thu) 2025	Held at the competition venue.
HEDC Competition	10 October (Fri) to 12 October (Sun) 2025	

## **8. Prize Money and Participation Support**

There will be prize money awarded based on mission performance results and rankings. Details about prize amounts will be announced online.

In addition to prize money, there will also be support for teams in the way of funding for shipping for competition equipment, travel, accommodation, and so on. Teams selected to compete will be notified of the details.

## **9. Webinar about HEDC and Japanese Act**

There will be a webinar in early March. Details will be announced online in the near future, so check the website.

## **10. Submitting Proposals**

### **(1) Proposal documents**

After completing the entry, please download the Application Sheets via the provided URL for 'Application Sheets (English) ' in the automated confirmation email.

### **(2) Proposal Submission**

After completing the entry, please upload and send the required documents via the "WRS2025 Application Sheet Submission Form" URL provided in the automated confirmation E-mail.

(3) Submission deadline

12th May t 17:00 (JST, strictly held)

Note: For details on how to fill out the proposal form, please refer the separate document, “HEDC Proposal Preparation & Completion Guidelines.”

## **11. HEDC Evaluation**

(1) Evaluation Details

Information about scoring each mission, not listed in Section 2 “HEDC Mission Scenario and Evaluation Criteria” (separate document) will be announced in February.

(2) Event date

The competition is scheduled for three days from 10th (Fri) to 12th (Sun) October 2025.

(3) Venue

Please refer to “Section 2: HEDC Mission Scenario and Evaluation Criteria.”

(4) Order of competition

The order of the competition will be decided by drawing lots on October 9 (Thur.) the day before the event.

(5) Evaluation impartiality

Impartiality of the evaluation process is ensured by preventing judges with a special interest in any applicant from involvement in evaluating said applicants. Please refrain from inquiring into the process or content of evaluations.

(6) Inspections

Teams will be checked to ensure they are complying with Japanese laws and competition rules, and be checked that they comply operational limitations such as ensuring that radio equipment complies with Japanese Radio Regulations, the maximum payload and whether proof, and are loading the designated items (location reporting system, automatic inflatable float, parachute), and so on. Judges will inspect aircraft and hold test flights in order to confirm stable flight is possible. Teams must undergo inspection before the HEDC Competition. Teams that fail inspection will be disqualified. This inspections will be held within 7 days before the HEDC Competition.

(7) Other points to note

Please refer to the separate document, “For All The Participants.”

## **12. Announcement of Challenge Results**

Challenge participants may be asked to present their projects results in the future.

## **13. Publication of Challenge Results and Intellectual Property Handling**

The contents and results of this Challenge will be published on the internet, in pamphlets, and other media. All intellectual property related to the equipment participating in the Challenge belongs to the participants, and we recommend that all intellectual property be protected prior to publication.

## **14. Notes of Caution on Participating in HEDC**

Please refer to the separate booklet “For All The Participants” for precautions and other information.

## **15. Inquiry Contact**

For inquiries related to HEDC, please use the contact information below.

[Secretariat of WRS2025 Harsh Environment F-REI Challenge]

Email address: [harsh-entry@worldrobotsummit.org](mailto:harsh-entry@worldrobotsummit.org)