

AIRBUS



HADR

Humanitarian Assistance & Disaster Relief

CHALLENGE

2018/2019


About us

- ✓ A non-profit trade association, focused on developing Singapore's space and related high technology industries.
- ✓ Serves as a neutral platform to facilitate information and communication for industry, government and academia.
- ✓ Spearheads initiatives that advances Singapore's space ecosystem
- ✓ Drives educational and outreach programs to encourage careers in space and high-technology engineering fields.




HADR Challenge


Humanitarian **A**ssistance and **D**isaster **R**elief

A photograph of a flooded urban street. In the foreground, a red and white striped traffic cone and a red plastic water barrier are partially submerged. A white pedestrian crossing sign with a black arrow pointing right is mounted on a metal stand. In the background, there are trees, a fence, and a building under an overcast sky. The water reflects the scene.

The application of satellite technology and its increasing role in providing quick, accurate and effective response to frequent and complex disaster situations is evident.

A satellite image of a large, swirling hurricane or tropical storm over the ocean. The eye of the storm is visible in the center, surrounded by dense, white cloud bands. The surrounding ocean is dark blue.

Across the world, countries have recognized the need of utilizing remote sensing satellite technologies as a critical tool in real-time disaster management.

A photograph of a space station module in orbit above Earth. The module is white with gold-colored thermal insulation. The Earth's blue and white cloud-covered surface is visible in the background.

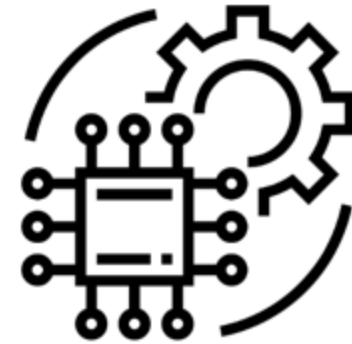
The HADR challenge was launched to tap into the creativity of students and working professionals to identify translatable solutions to complex problems of coordination and technology usage in HADR.

Objectives

- Utilise **satellite and mobile technology** developed by participants to **aid rescue efforts** in the event of a disaster



- Encourage youths to **incorporate space technology** and engineering into daily lives



- Provide a ground for students and subject matter experts to **communicate and exchange ideas**



- To **raise awareness** on space technologies to the public



Scenario

Flood Disaster

Premise:

- Dam failure
- Insufficient and poor drainage system
- Heavy monsoon season due to climate change

Situation:

- Property, houses, and basic infrastructure washed away by flood waters
- Survivors are scattered, some holding out on rooftops and higher grounds with dense overgrowth
- Disaster zone is spread across the borders of multiple neighboring countries

Challenge

The challenge scenario will require teams to formulate innovative solutions in one the following areas to aid in disaster management



Communications

Development of a simple radio handset/hardware that can communicate with LEO satellite systems or a high altitude pseudo-satellite

- **End goal – a working prototype**

Choose
One



Geolocation

Identification and estimation of locations through GNSS geolocation for delivery of the radio handset or hardware to users in need

- **End goal – physical demonstration or simulation of delivery**

Assumptions

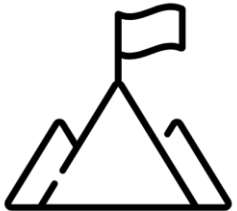
- Assumed deployment of Zephyr¹ in the disaster zone for imaging and comms purposes
- Historical bombs or mines may be dislodged due to flood waters, it'll be ideal to take this into account

Points to Note

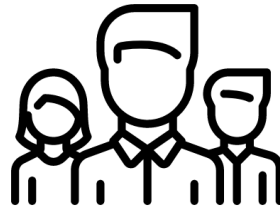
- Participants will need to take note of regulatory confines and limitation when designing their solution
 - Eg. Airspace restrictions concerning helicopters and drones
 - Radio handset should be language agnostic (given the presence of multiple national borders in disaster zone), ergonomic and user-friendly
- Participants will be given the following sets of data (to be finalized):
 - Satellite images of a flood disaster area (before and after)
 - Infrared images of flood areas
 - Technical specs and workings of satellite imaging technology

¹ A product of Airbus, the Zephyr is a high altitude pseudo-satellite fills the capability gap between satellites and UAVs. It runs exclusively on solar power, and flies above the weather and above commercial air traffic.

Format



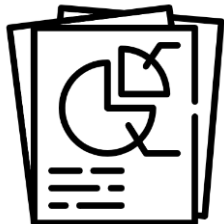
Challenge is open to all members of public, students and working adults



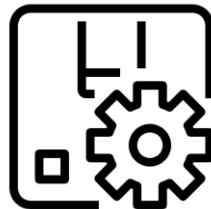
Entries may be submitted as an individual or group of 3 pax max



Briefing videos by subject matter experts will be shared with participants and an online Q&A session will be held (date TBC)



Each group must submit a 3-page proposal, and a video recording of presentation

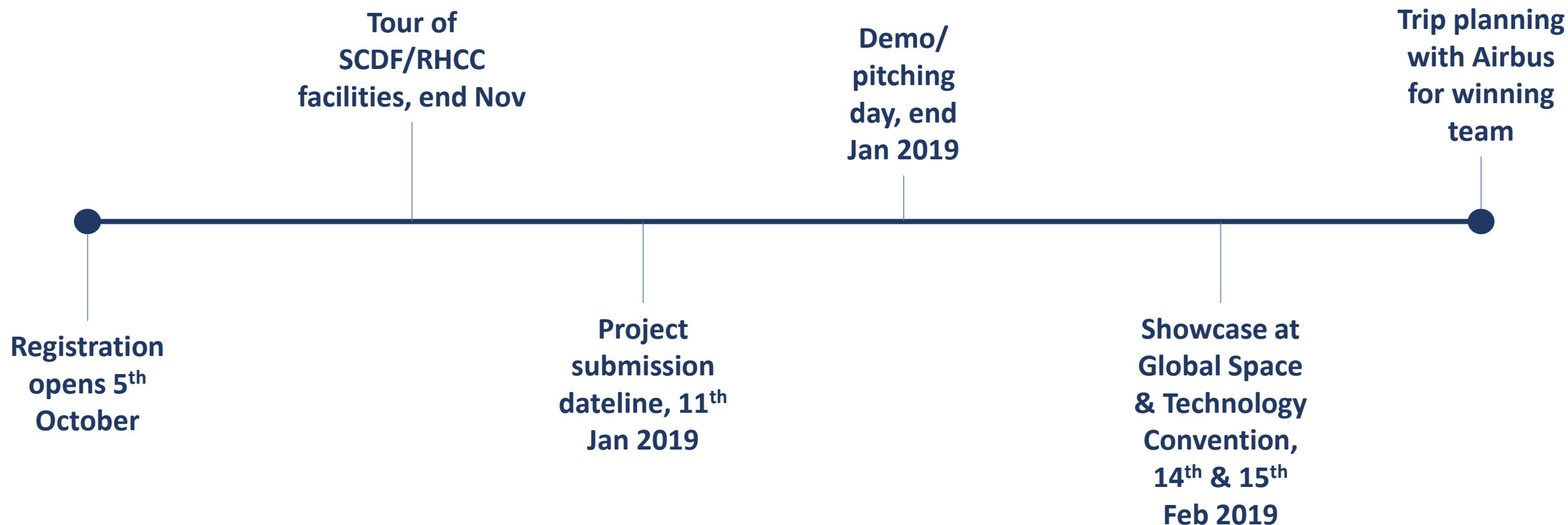


*More details to follow on prototype requirements



Grand prize: Visit to Airbus' facilities in Toulouse, France

Timeline & Key Dates



Main Sponsor

AIRBUS

Airbus Defence and Space

Supporting Partners



Singapore Civil Defence Force



Regional HADR Coordination Center Changi

Past Challenge in 2017/2018





Thank you!

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