

#### [O-1]: Verification of Helicopter Operation Optimization

##### <Objectives> :

- Improving access rates during rough weather via helicopter operations
- Reducing wind turbine downtime

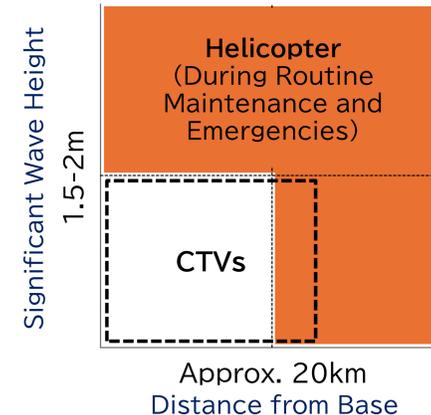
##### Background & Challenges

- Limitations of Conventional Vessel Access: Access by conventional vessels is heavily restricted by natural conditions, and there is a high risk of decreased access rates, particularly during the winter season.
- Need for High-Speed, High-Access Transport: As projects move further offshore to areas such as the EEZ, transport methods that offer superior travel speeds and higher access rates are required.
- Emergency Access Means: Access methods are essential for urgent situations, such as worker rescues or failures at offshore substations.
- HSE: In Europe, helicopter transport is highly valued from a labor health and safety perspective due to the physical burden on maintenance workers during transit and tower climbing.
- Verification for Floating Offshore Wind: While helicopters are used for fixed-bottom offshore wind in Europe, there are few instances of their use for floating wind; therefore, it is necessary to verify the unknown impacts of floating motion.

##### <Objectives> :

Utilizing Helicopters in Areas Not Covered by CTVs

Ensuring Access Under Natural Conditions Difficult for CTVs

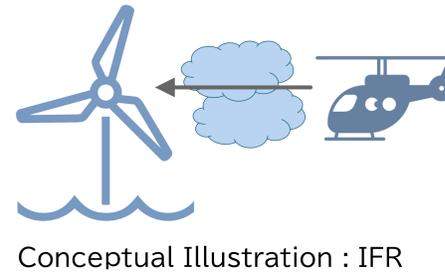


▶ Rapid transport to wind turbines during emergencies enables early restoration of operations.

### Research & Development Details

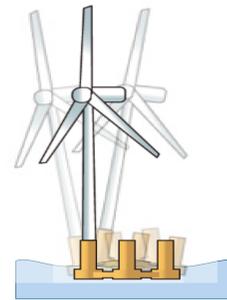
#### 1. Access Rate Improvement via Low-Altitude IFR

- Challenge: Even in conditions where Visual Flight Rules (VFR) are not possible (e.g., poor visibility due to dense fog), flights may be feasible under Low-Altitude Instrument Flight Rules (IFR).
- Implementation: To realize Low-Altitude IFR operations in the target area, we will conduct consultations with the Civil Aviation Bureau (JCAB), provide specialized personnel training, and procure suitable aircraft.



#### 2. Evaluating Floating Motion Limits for Hoisting/Operating

- Challenges: In severe sea conditions with significant floating motion, it may be impossible to safely lower personnel or cargo via hoisting.
- Defining Safety Thresholds: We will conduct an integrated study of "Sea/Weather Conditions – Floating Motion – Hoisting Feasibility" to clarify specific operational thresholds.



Conceptual Illustration : Floating Motion in Rough Weather

#### 3. Optimization of Transport Routes

- Comparative Logistics Analysis: We will compare transporting from airports (trucking personnel/goods to an airport, then flying to the turbine) versus transporting from non-airport locations such as O&M bases (off-airport landing sites).
- Determining Optimal Methods: The goal is to identify the most efficient transport routes and methods for the project.



Proposed Flight Routes

### Acquiring Offshore Wind Operational Expertise Through Business Alliances with European Operators



Personnel/Cargo Transfer to Nacelle



Landing on Offshore Substations



Offshore Flight

### (Reference: Past Achievements) Helicopter Cargo Transport to Floating Platforms



(Demonstration Project of Next-Generation Floating Offshore Wind Turbine : NEDO)