

Project Title: International Collaborative Research for Standard Ground Erosion Tests

Against Blade Erosion (2022–2025*) *scheduled

Entrusted Parties: Niigata University, Nagaoka University of Technology, Shinshu University, The National Institute of Advanced Industrial Science and Technology

Outline of the Project

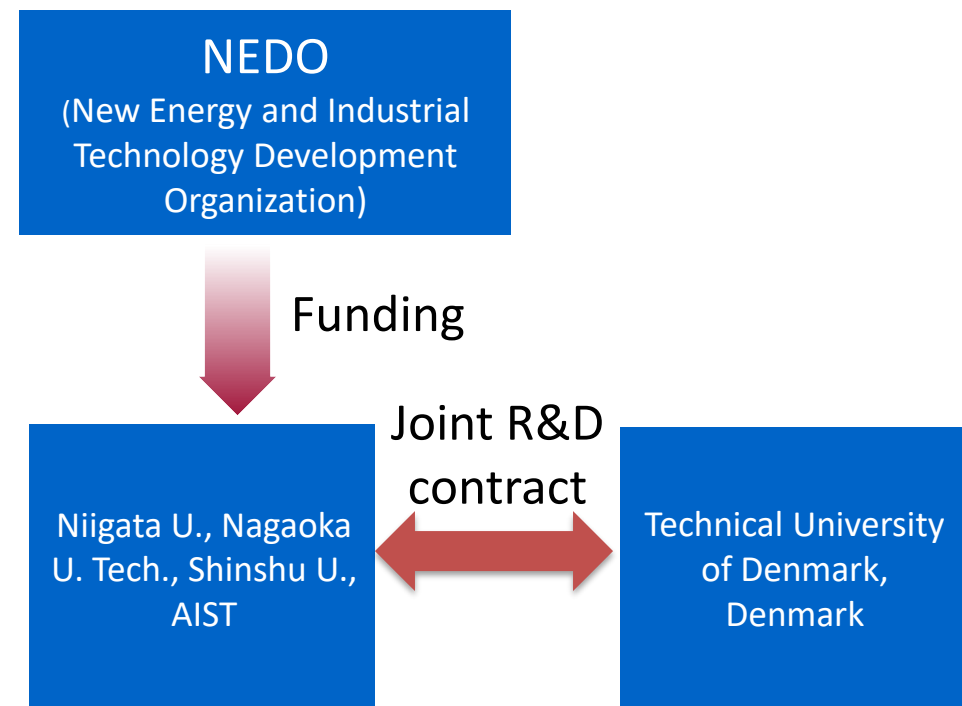
- Background: In wind power generation, erosion prediction is extremely important for the maintenance of wind turbine blades. Clarifying the relationship between droplet impact force and the erosion phenomenon by considering the effects of a liquid film formed on the blade surface and establishing a test method to predict the progress of erosion are urgent issues.
- Purpose: The purpose of this project is to standardize ground test facilities to establish a prediction method for the erosion characteristics of wind turbine blades.
- Content: By conducting erosion tests using common standard blades with three kinds of test equipment (a pulse jet type, a whirling arm type, and a rubber ball type), the relationship between erosion initiation and number of impacts will be explained through measurements and theoretical calculations and a basis for the standardization of testing methods will be established.



Significance of International R&D

- By clarifying the characteristics of different types of erosion test equipment in Japan and overseas, the principles for predicting erosion phenomena in equipment through ground tests will be established.
- The basis for an international standard for erosion prediction test methods can be established by comparing the different test methods.

Project Scheme



Expected Outcomes

- By standardizing ground test facilities, this project will establish a basis for predicting erosion on wind turbine blades.
- By improving the ground test and the erosion protection performance, power generation and industrial activity in Japan will be improved.
- A CO₂ emissions reduction (4.36–11.43 million ton-CO₂ year) and an energy-saving effect (crude oil equivalent=1206 kL/year) are expected after 2040.