資料9－4

Outline of JAEA/CLADS's Proposal for the NEST Project

- Advanced Remote Technology -

(Excerpt)

July 3rd, 2018

Collaborative Laboratories for Advanced Decommissioning Science（CLADS）
Sector of Fukushima Research and Development,
Japan Atomic Energy Agency (JAEA)

Background of the NEST Project

OECD/NEA has launched the Nuclear Education, Skills and Technology (NEST) activities Framework in 2016.

To energize advanced students, post-doctoral appointees and young professionals (hereinafter referred to as "NEST Fellows") to pursue carriers in the nuclear field by:

- Establishing a multinational framework among interested countries to maintain and build skills capabilities;
- Establishing international links between universities, academia, research institutes and industry;
- Attracting technologists from other disciplines to examine nuclear technology issues;
- Involving such actors in the resolution of real world problems.

Short description of the proposed NEST Project

To contribute to the NEST activities, CLADS has proposed a NEST project in research area of Advanced Remote Technology which has the wide effect not only for nuclear technology on the decommissioning under intense gamma-ray irradiation environments but also the other technologies and industries.

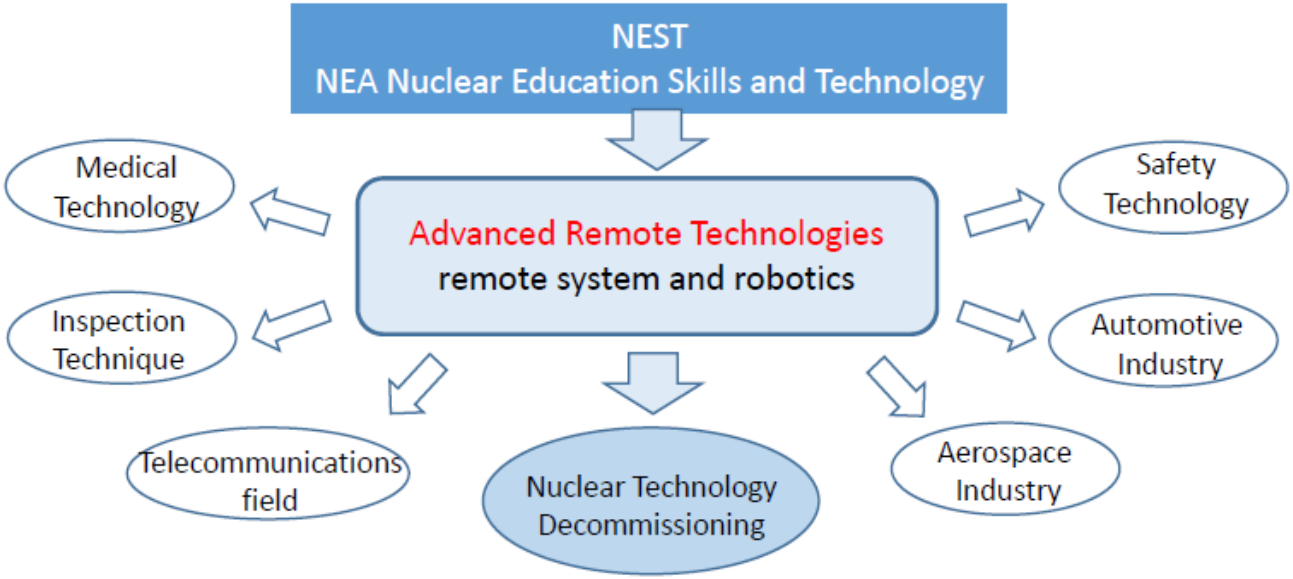


Fig. 1 Spreading effect of NEST project on advanced remote technologies

The Proposed NEST Project's Management Structure

The University of Tokyo
Research Task Manager-1

Participating Organization-1
Research Task Manager-2

Participating Organization-2
Research Task Manager-3

Participating Organization-3
Research Task Manager-4

7 organizations of Platform for Basic Research on Decommissioning in Japan

Leading Organization : CLADS & the University of Tokyo

NEST Project Integrator: CLADS-affiliated & University Professor, Prof. Hajime Asama
Assistant Integrator: CLADS-assigned professional.

NEST Fellows: Graduate students, post-doctoral appointees, JAEA professionals etc.（To be coordinated with the MEXT Human Resources Development Program.）

Participating Organization-1
Research Task Manager-1

Participating Organization-2
Research Task Manager-2

Participating Organization-3
Research Task Manager-3

Participating Organization-4
Research Task Manager-4

Foreign countries

Program of Work and Duration of the NEST Project(1/4)

☐ ***The proposed NEST Project consists of a short program and a long program.***

- ***The short program in this year*** consists of ***theoretical seminars, practical exercises and site tours of the 1F***, and is scheduled as follows;

Date	November					December					
	26	27	28	29	30		3	4	5	6	7
	Mon.	Tues.	Wed	Thur.	Fri.	Sat.& Sun.	Mon.	Tues.	Wed	Thur.	Fri.
The Short Program	Theoretical Seminars		Site Tours of the 1F	Practical Exercise (1) in JAEA		Transfer	Practical Exercise (2) in The University of Tokyo				

- ***The long program*** will be held for 3 ～ 6 months next year.

Program of Work and Duration of the NEST Project(2/4)

☐ ***Theoretical seminars*** in the short program

The proposed NEST project provides ***two seminars on*** ① & ②

① “Radiation Hardness and Smartness in Remote Technology for Nuclear Decommissioning (tentative title)”

② “Radiation Measurements for Decommissioning of the 1F (tentative title).

Though the details are under consideration, their outline are as follows;

Session 1 ; Advanced Sensing Technology
Session 2 ; Experiences in Intense Radiation Field
Session 3 ; Radiation Smartness
Session 4 -1; Radiation Hardness
Session 4 -2; Radiation Measurement
Session 5 ; Panel discussion
(Session 1～ session 3 are common to both ①&② seminars)

Program of Work and Duration of the NEST Project(3/4)

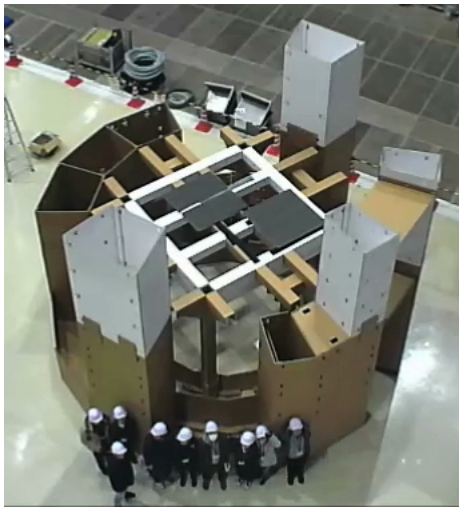
☐ ***Practical exercises (1)*** of the short program ***in Naraha Remote Technology Development Center of JAEA***

- Immersive experience by virtual reality for understanding of circumstances inside the reactor buildings and virtual operations by simulated remotely operated robot

- Operation experiences of obtaining information of experimental environment by laser range finders and a camera sensor mounted on a mobile robot in the mock –up

- 3D projection of obtained sensory data

Virtual Reality and simulation system



Cardboard pedestal mock-up

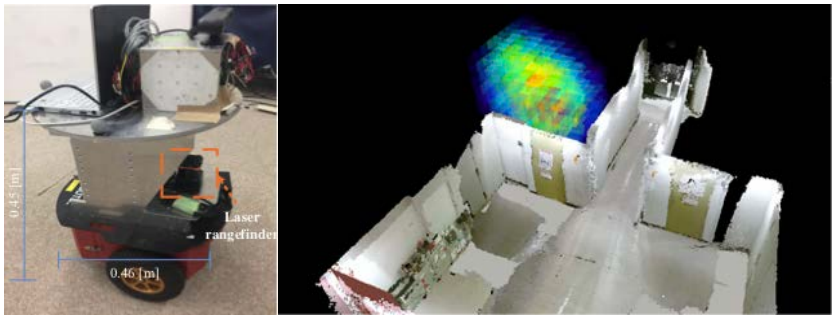
Program of Work and Duration of the NEST Project(4/4)

☐ ***Practical exercises (2)*** of the short program ***in The University of Tokyo***

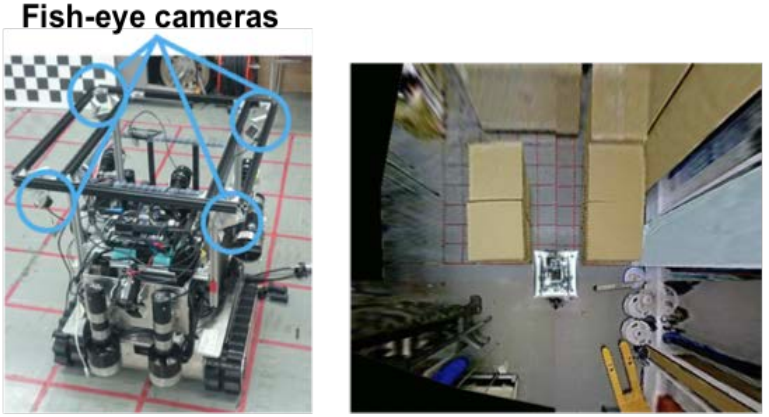
- Detection of radioactive sources by using a gamma-ray detector mounted on a mobile robot

- Mapping of radiation distribution and combining the map with the experimental environment of practical exercises (1)

- Operation experiences of remote control robot using bird's-eye view system



Detection of radioactive sources (Left: Mobile robot with a Compton camera, Right: An example of radioactivity distribution mapping)



Bird's-eye view system (Left: Mobile robot with four fish-eye cameras, Right: Generated bird's-eye view)