DEVELOPMENT AND ACTIVITIES OF EDUCATION PROGRAMME, “TOWARD A SAFE AND DISASTER-RESISTANT SOCIETY”



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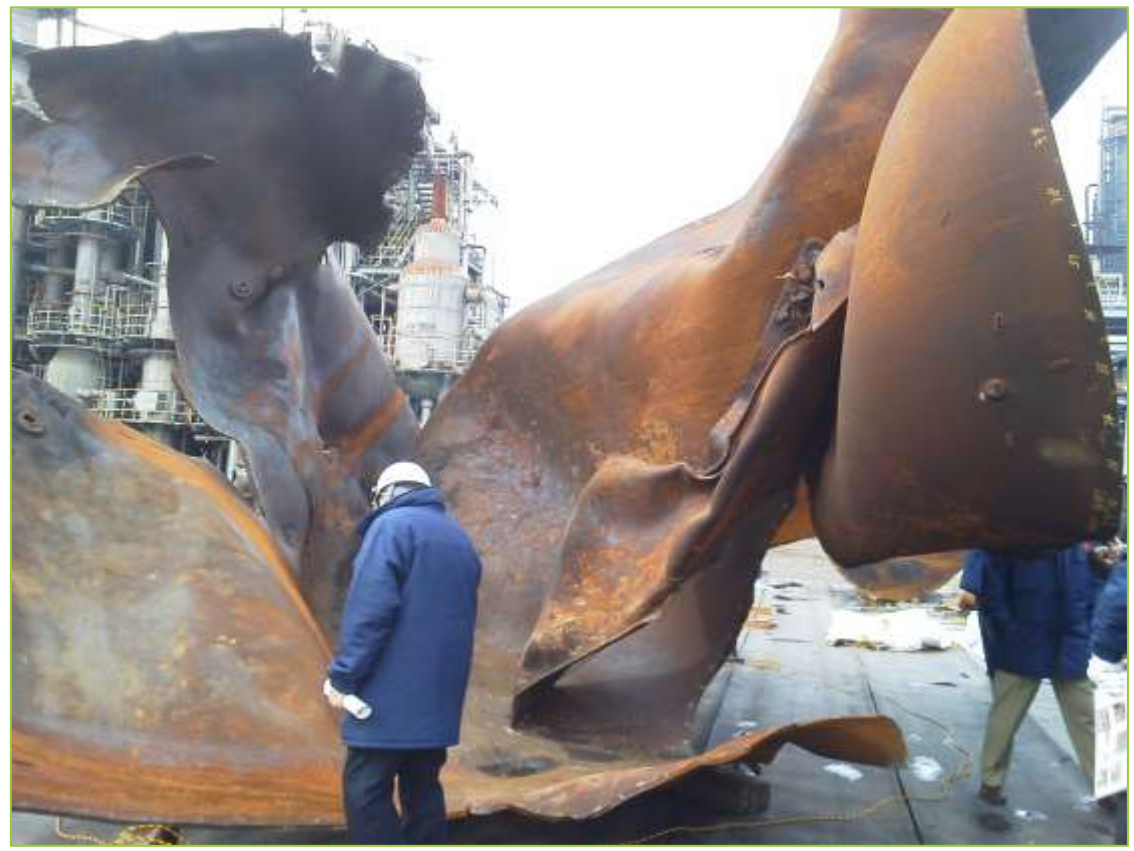
Introduction

OKAYAMA

Seto Inland Sea National Park

Mizushima Industrial Complex

Recently we faced several severe accidents in large industries in Japan.



After the Fukushima accident, most Japanese people feel anxiety not only to nuclear engineering, but also in science and technology.

We need to rebuild public trust in nuclear safety.

Our society needs to be assured about the safety and reliability of industrial facilities to prevent accidents.

We have a responsibility to convey what we have learned from experiences to the younger generation.

Center for Safe and Disaster-Resistant Society

Okayama University is one of the leading universities in Japan, and we have run a research and education project related to nuclear engineering and radiation health problems since 2008.

Our mission is to give a solution to the urgent requirement of human resources with high level skill and knowledge and ethics.

"ENGINEERING RESEARCH AND EDUCATION ON SAFETY AND SECURITY UNDER LOW-LEVEL RADIATION ENVIRONMENT"

Researches

- Use of low level radiation
- Destruction using robotics tech.
- Environmental assessment
- Radioactive waste management
- Reduction of radioactive wastes

Education

- Ningyo-toge Satellite classes (field experiences)
- Training cooperated with Tsuyama N.C.T.
- Cooperation with JNHRDN
- Cooperation with JNEN

Energy Resource Security and Ecological/Economical Development Contributing to the Future Society

International Cooperation

- Countries using nuclear plants
  Korea; KAERI, KIGAM
  Canada; NWMO, McGill Univ.
- Implementers
  NAGRA (Switzerland)
  Posiva (Finland)
  etc

Contribution to local communities

- Community development program; Kagamino and Misasa
- Health improvement
- Recurrent education of engineers
- Program for field experiences for primary, secondary and high school students

After the severe accident of the Fukushima nuclear power plants due to the Great East Japan Earthquake and Tsunami, in 2011

the safety management for large facilities must be reconsidered

Now the aim of previous project is to enhance the tolerance ability of our human society against severe natural disasters.

Okayama University established “Center for Safe and Disaster-Resistant Society”, in 2014.

We provide special program course for graduate school and intensive course for working people.

Main Research Theme

- Development of Safety Assessment System
- Safety Education and Training System using VR/AR
- Evaluation for adaptability of computational methods for elucidation of transportation mechanism of nuclides
- Study on mechanism of radon transportation
- Fundamental study on engineering barrier for radioactive waste
- Study on the Health Effects and Medical Applications by Low Dose Radiation
- Study on Radioactive Waste Disposal Technology
- Study on Fukushima Environmental Dynamics

Research Activities

Research papers, commentary and books in past 5 years.

Research Papers	Books	General Remarks and Commentary
126	6	7

The Center’s research has been extensive covering a wide range, natural disasters and human behavior and decision making from a wider perspective topics.

Education Programme, “Toward a Safe and Disaster-Resistant Society”

An accident of nuclear plant causes profound effects on the broad region. We need effective leadership especially in emergency.
In addition we should consider how to recover from damage of accident. The information including risk must be shared by all stakeholders.

The key topics;

- Safety design for disaster-resistant nuclear /chemical facilities
- Radioactive waste management
- Radiation measurement
- Safety culture
- Risk communication.



Special program course for graduate school:
“Toward a Safe and Disaster-Resistant Society”

A) The Master's course Class Subjects	
Nuclear engineering I Basic course	Radioactive Waste Management I
Human activities and the environment – toward a low-carbon society	Radioactive Waste Management II
Nuclear engineering II Basic course	Environmental Numerical Analysis
Risk Communication for Public Acceptance	Radiological Health Science
Internship in Safe and Disaster-Resistant Society	Radiation Safety Management
Risk analysis	Radiobiology
Plant Safety Design	Radiation Metrology
Human Resources Risk Management	Study on Radiation and Human
Organizational Risk Management	Radiation Protection Study
Safety Management	

B) The Doctor's course Class Subjects
Topics in Radiation Safe and Medical Application Study
Topics in Radiation Safe Study
Topics in Radiological Life and Health Science
Topics in Applied Therapeutic Radiology
Topics in Radiation Metrology & Application Study
Safety Management for Nuclear Facility
Resilience Engineering
Evaluation of Geo-environment
Radioactive Waste Management : Theory and Practice

Internship in Safe and Disaster-Resistant Society

Organizational Risk Management

Special Seminar and research exchange

Education Activities

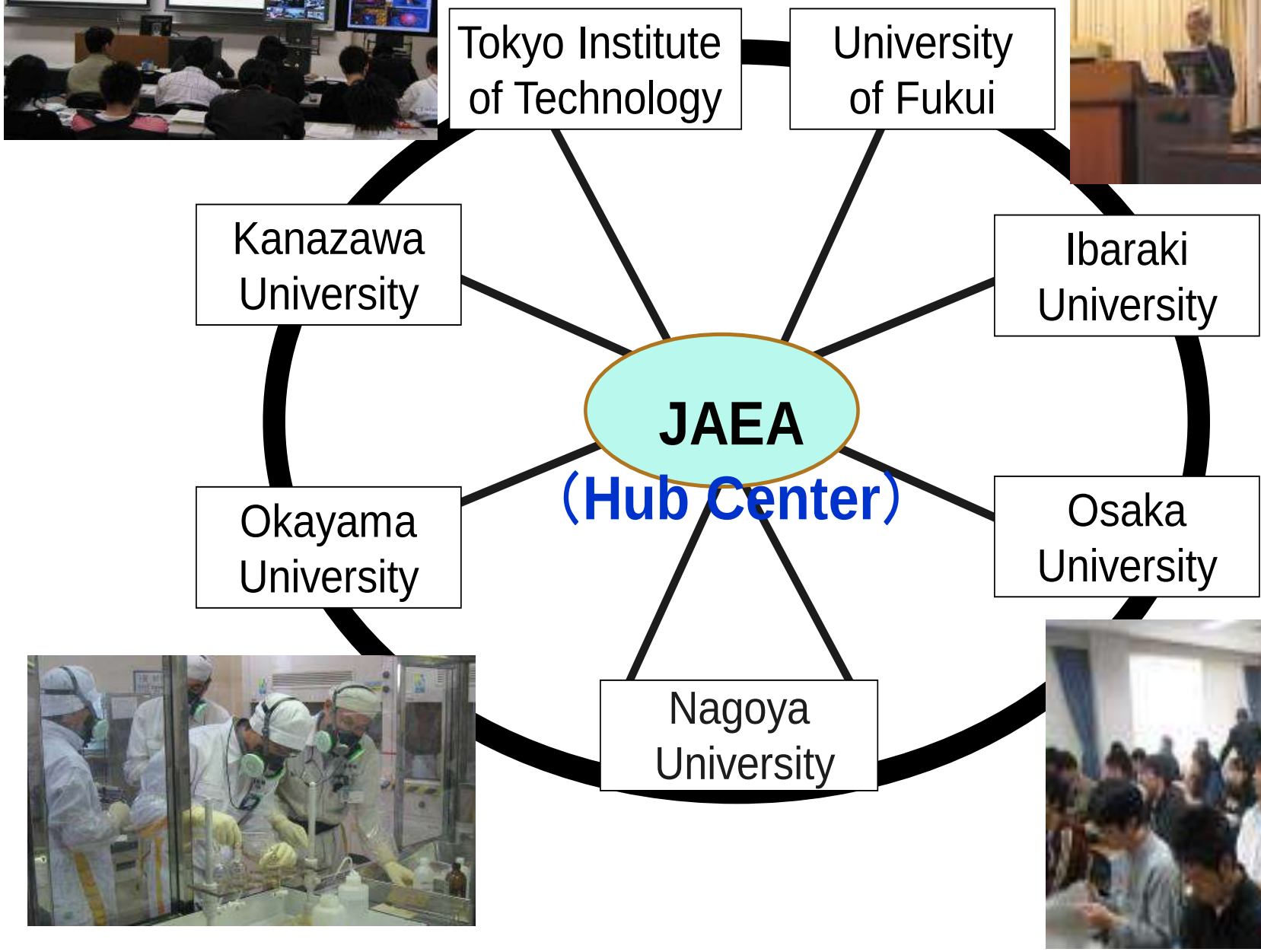
Students newly enrolled in the year

Year	The number of students (Master Course)	The number of students (Doctoral Course)
2008	7	
2009	8	
2010	13	2
2011	10	3
2012	11	3
2013	11	4
2014	7	1
2015	18	2
Total	85	15

Graduates of Employment Companies

Doctoral Course, Okayama University	SANKI ENGINEERING CO., LTD.
Hyogo Ion Beam Medical Center	DENSO CORPORATION
Shigei Hospital	KOBE STEEL, LTD.
KARIYA TOYOTA GENERAL HOSPITAL	NTN Corporation
Beru Rand General Hospital	DAICEL CORPORATION
Advanced Science Research Center, Okayama University	WEST JAPAN RAILWAY TECHSIA Co., Ltd.
NEXCO CENTRAL	FUJITSU TEN LIMITED
JAEA (Japan Atomic Energy Agency)	Hitachi Zosen Corporation
SUMITOMO BAKELITE CO., LTD.	DAIKIN INDUSTRIES, Ltd.
OMRON Corporation	Daio Paper Corporation
Nabtesco Corporation	Nomura Research Institute, Ltd.
THE CHUGOKU ELECTRIC POWER CO.,INC.	JFE Systems, Inc.
Fuji Xerox Co., Ltd.	NTT COMWARE Corporation
GLORY LTD.	Ehime Prefectural Office
NAKASHIMA PROPELLER Co.Ltd.	OSAKA GAS CO., LTD.
DOWA HOLDINGS Co., Ltd.	etc.

Education network and Active learning



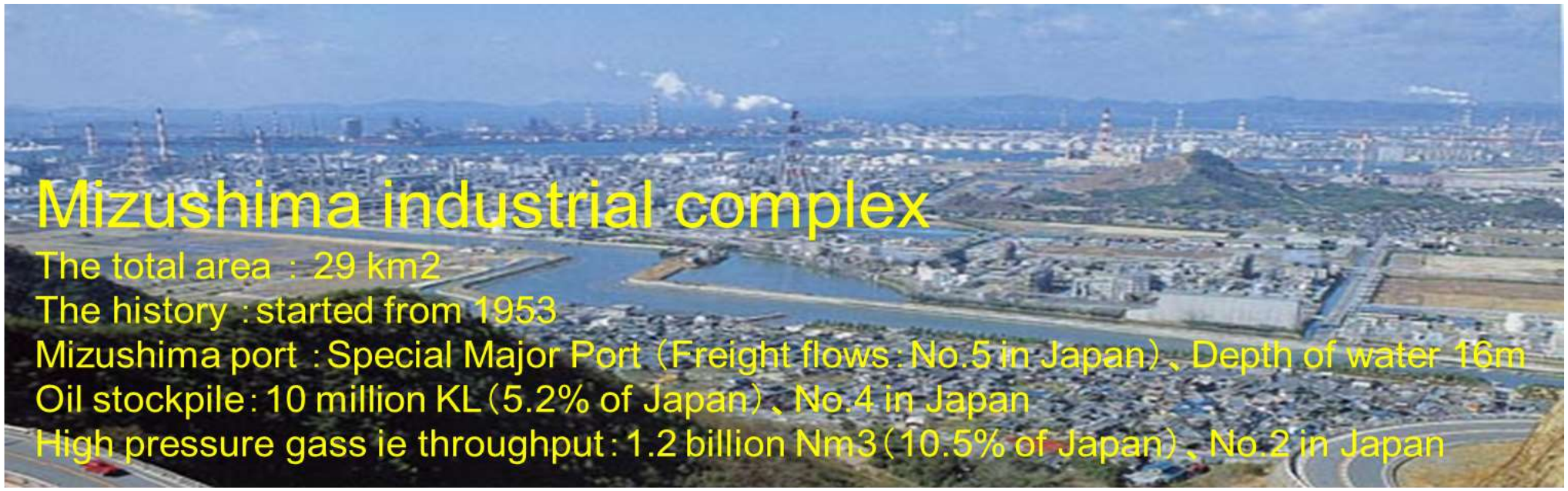
Japan Nuclear Education Network (JNEN)

The summer session “Environments and Human Activities”

Social Action work

Ningyo-toge Environmental Technology Center, JAEA

Okayama University



Cooperation with All Stakeholders

For the Future Generations

- Nuclear Safety is increasingly utilized worldwide. Recovery of trust from the Fukushima and other accidents is a keen issue.

- The Safety Culture must be rebuild for all managers/engineers.

- The concept of Risk should be understood for all stakeholders.

- Personnel exchanges between companies and universities is more important.
- New education program for working people will be arranged.
- Okayama University can make connections of graduates so that they improve a safe society.

How should we do to prevent accidents?

How can we protect people from natural

We don't have a magic wand.
Education/training and establishing safety culture could be a part of solution in the future.
But considering back ground of safety problem, we can find the way to prevent accidents.

Acknowledgement

We sincerely appreciate Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan.
Also we wish to express our sincere appreciation to JAEA, especially Human Resource Development Center.
We are sure that our university and the center could not achieve such fruitful results without these supports.

Thank you for your attention.