

Presentations by Nuclear Related Organizations

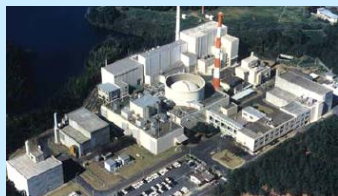


Japan Atomic Energy Agency (JAEA) -Mission and Major Activities-

Mission Contribution to the nuclear use both in terms of energy and science as **the comprehensive nuclear R&D organization**

Number of Employees: approx. 3,900
Budget: approx. 155 billion Yen (approx. 1.3 billion EURO)

R&D for Advanced Reactors



Experimental Fast Reactor Joyo



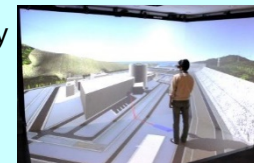
High Temperature engineering Test Reactor (HTTR)

Nuclear Safety, Non-proliferation and Security



Nuclear Safety Research Reactor (NSRR)

Static Experiment Critical Facility

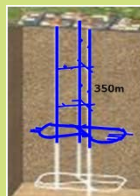


Nuclear Security Virtual Reality System

R&D for Nuclear Fuel Cycle and Disposal of Radioactive Waste



ADS: Accelerator-Driven System for nuclear transmutation

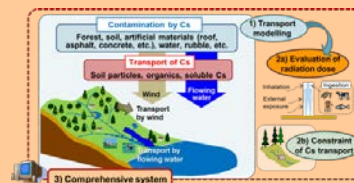


Horonobe Underground Research Laboratory

R&D for Decommissioning and Environmental Recovery for 1F * Accident



CLADS as an International innovation hub for R&D on the decommissioning of TEPCO Fukushima Daiichi Nuclear Power Station

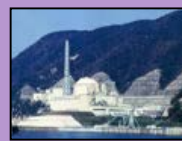


Long-term assessment of radionuclides behavior in the environment

Decommissioning of our own facilities and Waste Management



Tokai Reprocessing Plant



Prototype Fast Breeder Reactor Monju



Advanced Thermal Reactor Fugen

Fundamental Research and Cooperation with Stakeholders



Accumulation of nuclear data



Promotion of the Utilization of Facilities by Outside Users



JRR-3



Human Resource Development

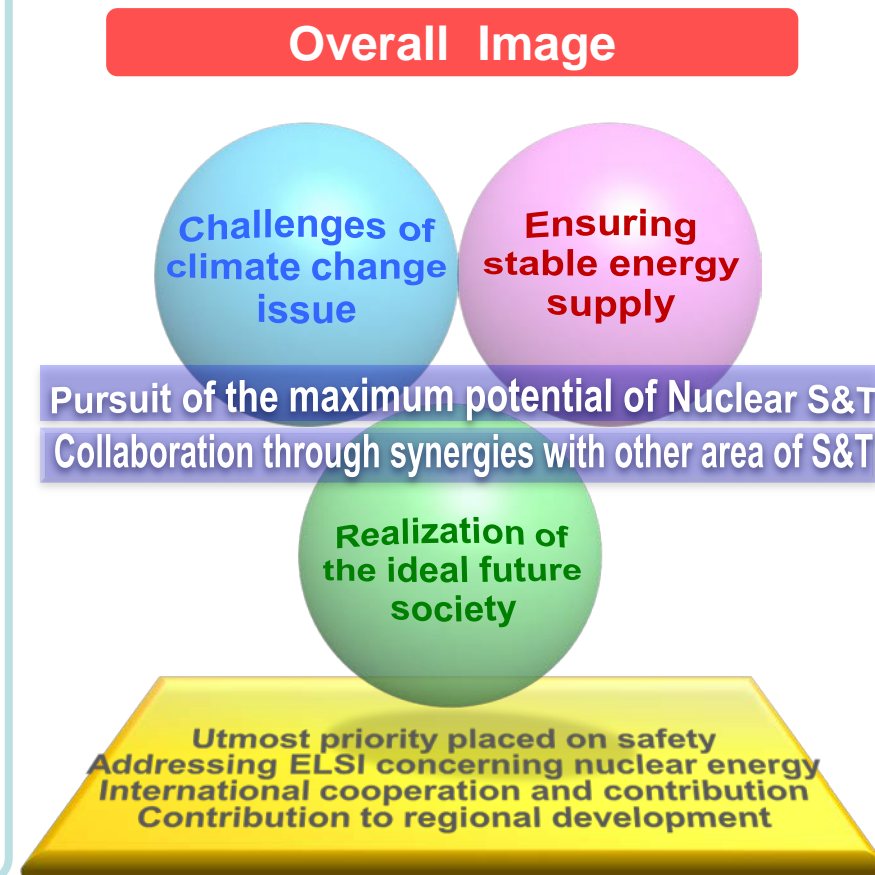
Released to public on October 31, 2019.

“JAEA 2050 +” outlines Goals and Actions we should take.

1. Goals toward 2050 and beyond

- ❑ Contribution to the future society by bringing out the full potential of Nuclear Science and Technology(S&T)
 - ◆ Mitigate the risk of **global climate change**
 - ◆ **Energy security**
 - ◆ Realization of Ideal Future society
- ❑ “**New Era Nuclear S&T**” reflecting on the lessons learned from 1F accident
 - ◆ “**New Era Nuclear S&T**” means
 - new endeavor beyond the existing framework to achieve the following goals through the interaction with the society in terms of the contribution to the future society*
 - ✓ **Development of Nuclear S&T systems that addresses “S+3E”**
 - ✓ **Creation of the innovations through synergies with other areas of S&T**
 - ◆ **Tackle the challenges including Ethical, Legal and Social Issues (ELSI) associated with Nuclear S&T and present solutions**

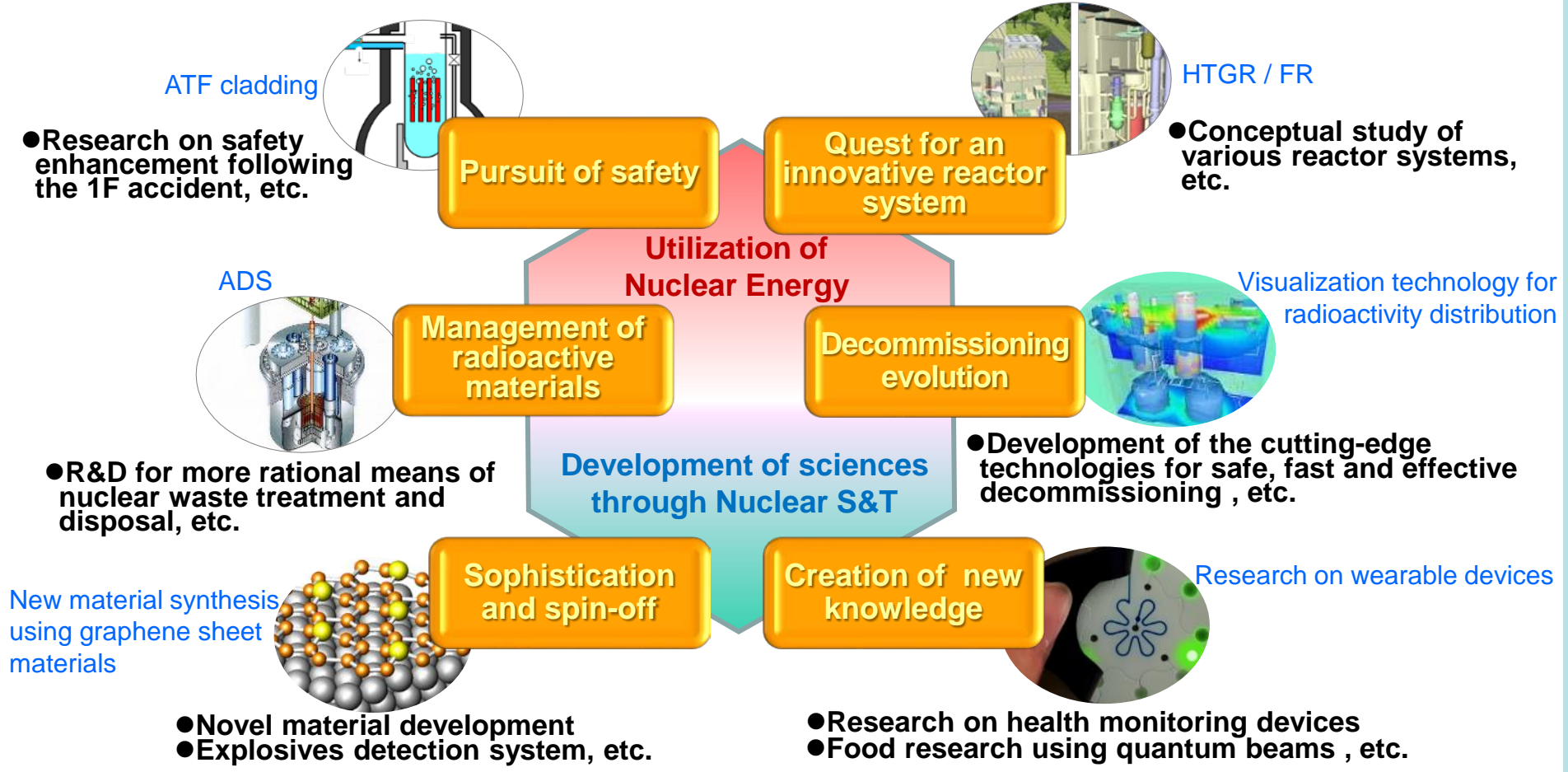
* S+3E: Safety + Energy Security, Economic Efficiency, Environment



2. Actions toward 2050 and beyond (1/2)

R&D that opens "New Era Nuclear S&T"

Establishing six research themes and promoting multidimensional R&D cross-sectionally and strategically



[The figures : example of R&D]



Japan Atomic Energy Agency (JAEA)

-Long-term Partnership with IAEA in a variety of fields of nuclear use-

**Approx. 140 experts participate in the IAEA meetings annually*

R&D for Advanced Reactors



63rd IAEA General Conference Side Event on High Temperature Gas Cooled Reactor Technology (HTGR) (Sep.18, 2019)

Nuclear Non-proliferation and Nuclear Security



Clean Laboratory for Environmental Analysis and Research (CLEAR) as a part of the IAEA network of clean laboratories



IAEA/ISCN* participates in the International Network for Nuclear Security Training and Support Centres facilitated by IAEA

*Integrated Support Center for Nuclear Nonproliferation and Nuclear Security

SSAC Training Course in cooperation with IAEA since 1996

Human Resource Development



Japan- IAEA Nuclear Energy Management School (every year since 2012)

*JAEA serves as a secretariat of the Japan Nuclear Human Resource Development Network with JAIF and JICC.



R&D for 1F Decommissioning

Decommissioning and Radioactive Waste Management

JAEA will host IAEA ARTEMIS mission on its decommissioning and waste management practice in May.



Conference on the IAEA Coordinated Research Project for Fuel Debris Characterization (Iwaki, Japan, Nov. 5, 2018)

JAEA will continue to make contributions to IAEA activities through such means as the provision of our technical expertise both as the meeting participants and IAEA secretariat.

- Personnel
- Board Members 6
- Full-time Staff 1,267
- Budget (FY 2019)
- ¥ 45.7 billion

Life

Quantum Medical Science



5th generation cancer treatment system "Quantum Scalpel"

Zero cancer deaths and a healthy, long-living society

Quantum Life Science

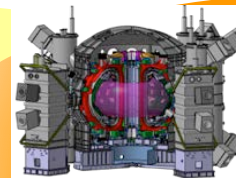


Understanding of life

Approaching for life science with quantum eyes and hands

Energy

Fusion Energy Science and Technology



JT-60SA under construction by EU and Japan



ITER under construction at France/ Japan, EU, USA, Russia, China, Korea, India

Creating a sun on the earth

- Realizing the ultimate energy for future -

Radiation safety



Response to radiation accidents and disasters

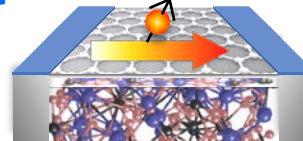
Protecting life and lifestyle with science



Research on radiation effects

Safety

Quantum Materials Science



Development of novel materials for innovative device

Creating innovation with quantum beams and material science



3GeV synchrotron radiation facilities

Quantum Optics

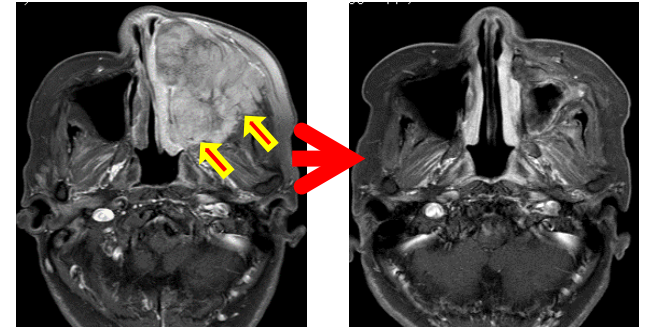
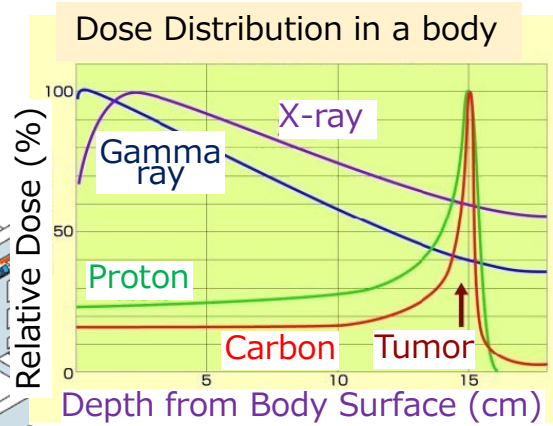
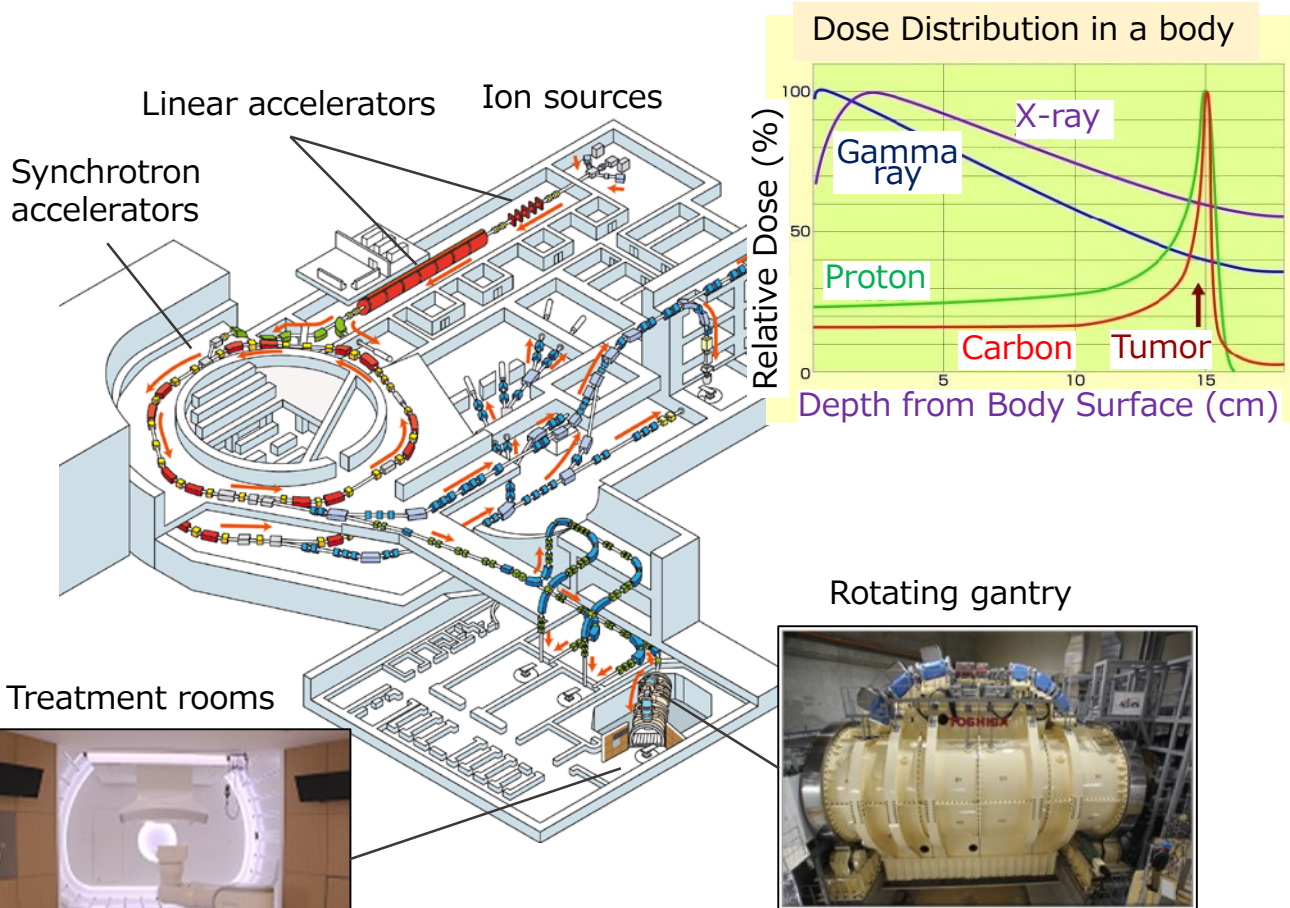


Advanced scientific research on laser and its application to everyday life

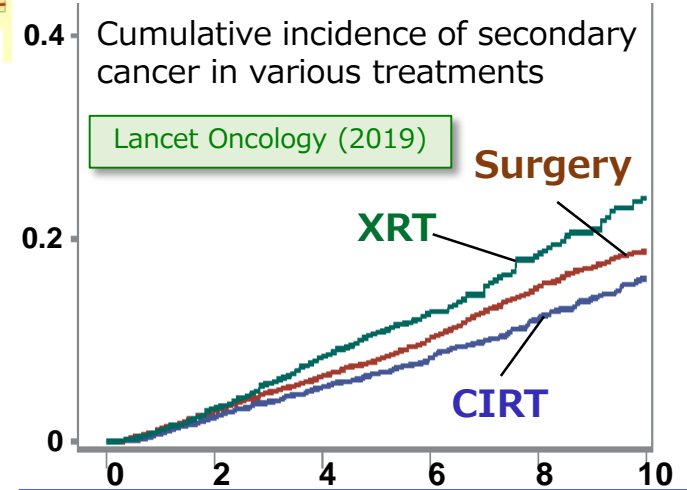
Everyday Life

The quest for future by lasers

- QST has treated **more than 12,000 patients** since 1994, with good treatment outcome, lower side-effect, shorter period and good Quality of Life.
- **Secondary cancer risk after Carbon-Ion Radiotherapy (CIRT) is less than X-ray treatment (XRT) in prostate cancer.**



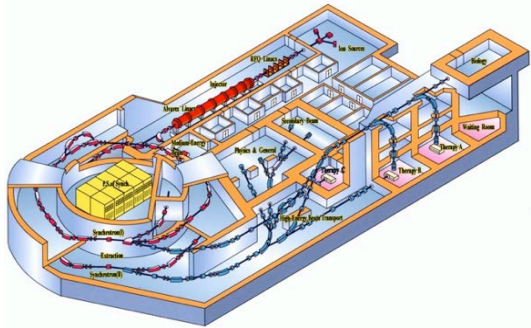
Decrease of "Adenocystic Cancer" after Carbon-ion Radiotherapy



CIRT vs
XRT : Relative risk 0.71, p=0.002
Surgery: Relative risk 0.86, p=0.11

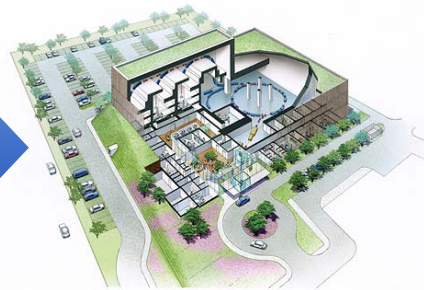
HIMAC (Heavy Ion Medical Accelerator in CHIBA)

1st generation



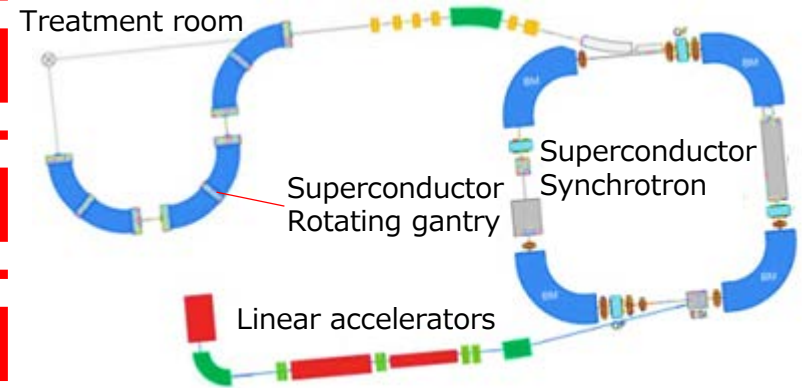
HIMAC in 1994
120X65m, 3M Euro

2nd/3rd generation



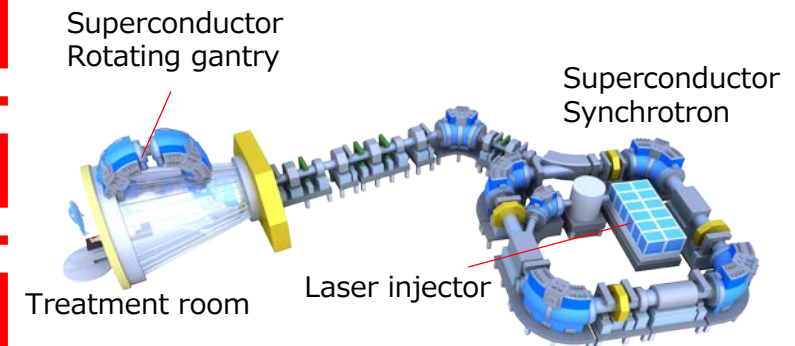
Gunma Univ. in 2010
60X45m, 1.2M Euro
(1/3 price down)

4th generation



25m

5th generation



20m

20X10m (About 1/40) and higher performance

- Smaller size and cheaper construction and running cost

➔ Laser Injector and Fast Superconducting Magnet

- More effective treatment

➔ Multi-ion Irradiation

IAEA-CC (Collaborating Centre)

- QST has been designated as IAEA-CC since 2006.
- The collaboration areas are (1) Biology for Risk Reduction of Radiotherapy, (2) Nuclear Medicine and Diagnostic Imaging and (3) Charged Particle Therapy.

IAEA-CBC (Capacity Building Centre)

- QST has been designated as IAEA-CBC for Emergency Preparedness and Response in Asia since 2017.
- To enhance training skills in effective dissemination and providing knowledge on emergency preparedness and response, and to sustainably develop human resources locally and internationally.

IAEA-CRP (Coordinated Research Projects)

- Member States' researchers share the experiences through CRP. QST participates in 3 projects.

IAEA-RCA (Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology for Asia and the Pacific)

- QST, JAEA, Gunma Univ. and The National Agriculture and Food Research Organization are promoting cooperative researches.

IAEA-JAIF Cooperation



February 25, 2020

Akio TAKAHASHI

President

JAPAN ATOMIC INDUSTRIAL FORUM, INC. (JAIF)





- Established in March 1956
- Chairman: Takashi IMAI (Honorary Chairman, Japan Business Federation)
- JAIF'S Members: 403 members (as of Nov. 2019)
 - Utilities, world-class reactor vendors, major general contractors, full scope of equipment suppliers, major trading companies, local gov'ts
- Mission: To promote peaceful uses of nuclear energy (utilization of energy, radiation and radioisotopes)
- Major Activities
 - ✓ Promoting regional and public understanding
 - ✓ Enhancing international cooperation
 - ✓ Securing and developing human resources
 - ✓ Supporting Fukushima revitalization

Cooperation with the IAEA

First NGO awarded "consultative status" by the IAEA in 1960.

➤ IAEA General Conference

- ✓ JAIF participating as an "Observer"
- ✓ Secretariat of Japan exhibition booth
- ✓ Meetings with DG and DDGs

➤ JAIF Annual Conference

- ✓ IAEA officials participate as guest speakers
- ✓ DG Amano (2010, 2015, 2017), DDG Flory (2013), DDG Mokhtar (2019)

➤ Japan-IAEA Nuclear Energy Management (NEM) School

- ✓ Developing future leaders to manage nuclear energy programs
- ✓ Held every summer since 2012 with over 260 alumni

➤ IAEA Interregional Training Courses ➤ IAEA International School

- ✓ Started in 2012
- ✓ "Stakeholder Interaction" & "Systematic Approach to Training (SAT)" in 2019
- ✓ Nuclear and radiological leadership for safety
- ✓ 3-year cooperation w/ Tokai University (2020~2022)



JAIF's International Activities

