# Plans and present status of regulatory compliance procedures for the Kindai Reactor low-enriched fuel conversion Project

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  for the LEU conversion project
- Organizational structure for the LEU conversion work
- Overall planned schedule and current position

# Background

- The Japanese and U.S. governments reached an agreement on 21 Sep. 2022 about the conversion of the last HEU research reactor fuel in Japan. (Kindai UTR's fuel)

文部科学省 MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY-JAPAN

サイトマップ | English | 文字サイズの変更 小 中 大 | Google Custom Search 検索

会見・報道・お知らせ | 政策・審議会 | 白書・統計・出版物 | 申請・手続き | 文部科学省の紹介

トップ > 会見・報道・お知らせ > 報道発表 > 令和4年度 報道発表 > 近畿大学原子炉(UTR-KINKI)の高濃縮ウラン燃料の撤去及び低濃縮化の実施を決定しました

## ◎近畿大学原子炉(UTR-KINKI)の高濃縮ウラン燃料の撤去及び低濃縮化の実施を決定しました

令和4年9月27日

9月21日、増子宏文部科学審議官とジル・ルビー米国エネルギー省国家核安全保障庁長官は会談を行い、近畿大学原子炉(UTR-KINKI)の高濃縮ウラン燃料の撤去及び低濃縮化の実施を決定しました。

近畿大学原子炉(UTR-KINKI)は、同大学原子力研究所が保有する実験用の原子炉であり、教育、訓練及び研究用に広く活用されています。
9月21日、増子宏文部科学審議官とジル・ルビー米国エネルギー省国家核安全保障庁長官はオンラインにて会談を行い、UTR-KINKIにおける高濃縮ウラン燃料の撤去及び低濃縮化を実施することを決定しました。
会談においては、ジル・ルビー長官より「日本において高濃縮ウラン燃料を有する最後の大学原子炉であるUTR-KINKIの燃料撤去について決定したことは、両国の核不拡散のマイルストンとして注目すべき本年における最新の成果である」とのご発言があり、増子宏文部科学審議官より「両国の協力のもと、UTR-KINKIの高濃縮ウラン燃料の撤去及び低濃縮化を着実に実施していきたい」と述べ、核不拡散・核セキュリティの更なる強化に向け、引き続き連携していくことで一致しました。
また、26日には、第66回IAEA総会の日本政府一般討論演説において、本プロジェクトの実施が表明されました。
文部科学省としては、両国共通の目標である世界規模での高濃縮ウラン保有量の最小化に向けて、本プロジェクトを着実に推進していきます。

お問合せ先

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Web site of MEXT/ Japan
September 27, 2022

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National Nuclear Security Administration > NNSA and Japan commit to convert Japan's last research reactor that uses highly enriched uranium

## NNSA and Japan commit to convert Japan's last research reactor that uses highly enriched uranium

NNSA and Japan agree to convert the Kindai University Teaching and Research Reactor (UTR-KINKI) from highly enriched uranium to low-enriched uranium fuel and to return all HEU to the United States.

National Nuclear Security Administration

September 27, 2022

2 min

*NNSA's Jill Hruby holds up a signed version of the MOU as her Japanese colleague, on video, does the same.*

### Agreement caps a productive year in minimizing Japan's HEU

**WASHINGTON** – Building on years of close nonproliferation cooperation, the U.S. Department of Energy's National Nuclear Security Administration (NNSA) and Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) announced a new commitment to convert the Kindai University Teaching and Research Reactor (UTR-KINKI) from highly enriched uranium (HEU) to low-enriched uranium (LEU) fuel and to return all HEU to the United States.

Web site of DOE/ United State
September 27, 2022

# Background

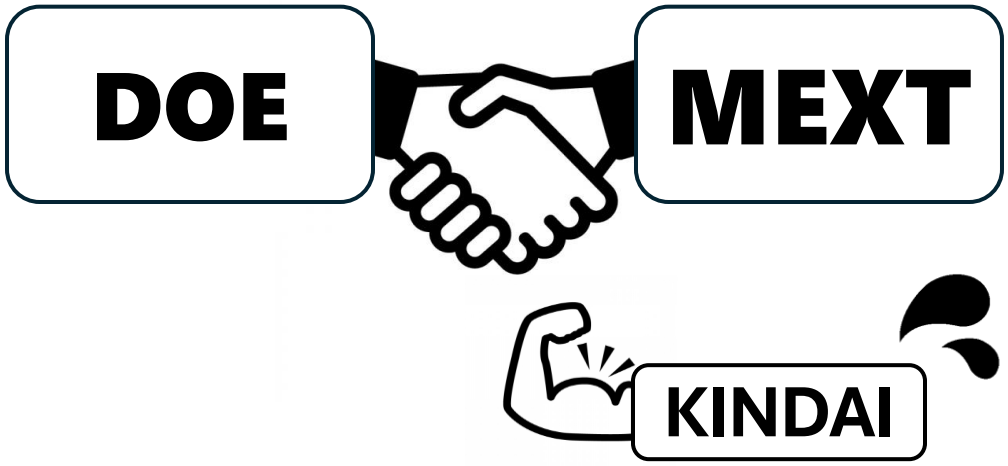
- Under this agreement, the Kindai reactor Fuel will be converted to low-enriched one, and the HEU fuel will be returned to the United States.

Prime Minister KISHIDA (Left) and President BIDEN (Right)
(10th April 2024) from MOFA-japan web site

**Deepening our Commitment to Nuclear Disarmament and Non-proliferation and Peaceful Uses of Nuclear Energy**: President Biden commended Japan's safe, responsible, and science based discharge of Advanced Liquid Processing System (ALPS) treated water into the sea. The two leaders welcomed that the U.S. Department of Energy and Japan's MEXT have removed all excess highly enriched uranium (HEU) from the Kyoto University Critical Assembly and Japan Atomic Energy Agency's Japan Materials Testing Reactor Critical Assembly to the United States and a new joint commitment to convert the Kindai University Teaching and Research Reactor from HEU to low-enriched uranium fuel and to return its HEU to the United States. The United States also joined the Japan-led "Fissile Material Cut-Off Treaty (FMCT) Friends" effort to demonstrate our shared commitment toward disarmament.

**From the "Fact Sheet: Japan Official Visit with State Dinner to the United States" (10 April 2024 Washington D.C.)**

# Background



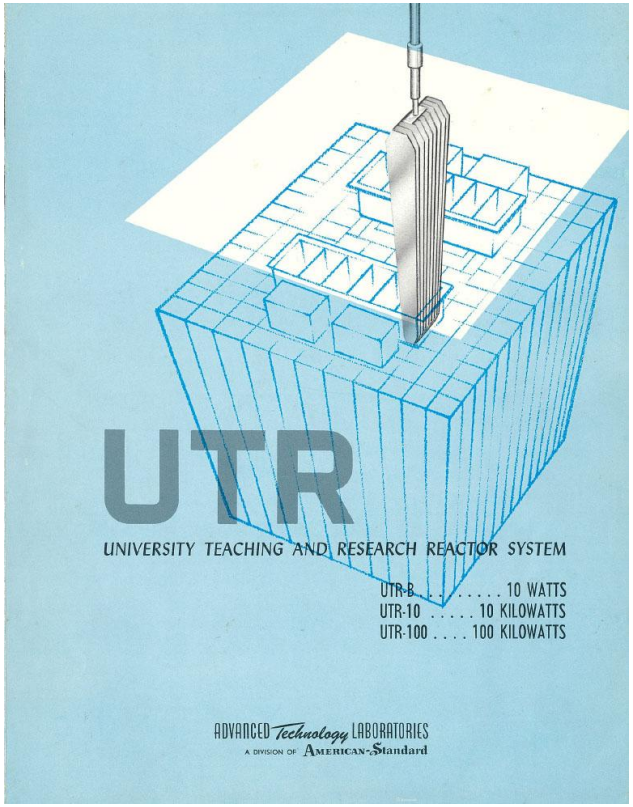

- Based on the inter-governmental agreement, Kindai University is preparing procedures for the LEU conversion and the return of the HEU fuel.

- This presentation reports on the license renewal procedures, the organizational structure for the works, the overall planned schedule and current state.

# About Kindai Research Reactor (UTR)

- The Kindai reactor is a UTR-B type nuclear reactor manufactured by American Standard Corporation around 1958.

Overview of UTR-Kindai




UTR leaflet cover

# About Kindai Research Reactor (UTR)

- It has been used as a university education reactor in Higashi-Osaka for over 60 years since it first reached criticality at Kindai University in 1961.
- The reactor's power is extremely low at 1W so it has quite few Fission Products, making it possible to access close to the core for research and training.
- Currently, as part of the Japanese government's nuclear education project, it is being used as a nuclear training site for universities all over Japan.
- It is also used as a place for Japanese basic education teachers (junior high school and high school teachers) to learn about radiation and nuclear reactor.

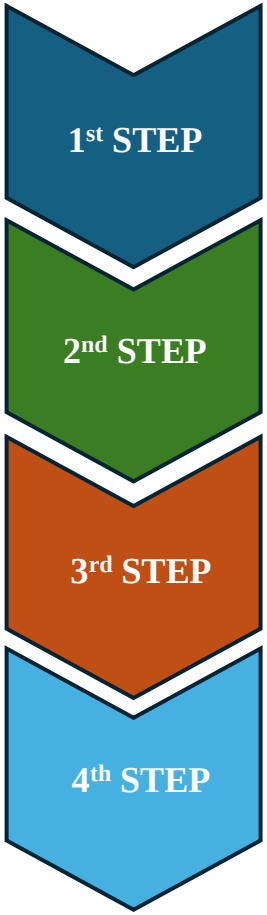
# About Kindai Research Reactor (UTR)

- The Kindai reactor's core is an Argonaut type, consists of two tanks containing light water and fuel, graphite neutron reflectors, control rods, and neutron detectors.
- UTR-Kindai still uses HEU fuel installed in 1961.
- In the LEU conversion project, fuel replacement is planned to be carried out in a way that exchanges HEU fuel with LEU fuel without modifying the reactor core structure.
- Due to Japanese regulatory requirements, additional fuel storage equipment will also be needed.

# Administrative procedures required in Japan for the LEU conversion project

- Regulatory procedures related to LEU projects can be categorized into facility-related procedures and transportation-related procedures.
- Facility-related procedures include license renewal and getting manufacturing approvals, etc.
- Transportation-related procedures include getting approval of the transport items, approval of the transport plan, etc.
- There are many regulatory agencies involved with the regulatory compliance work for the LEU conversion project, therefore, the procedures require a great deal of effort.

# Regulatory Steps in Japan for the Research Reactor (Facility) License Renewal




Obtaining the Permission for the Design Policy (we call "ICPAF")
(Equivalent to "design certification" + "prior site approval")

Obtaining the Approval for the Detail Design & Fabrication
(we call "Hardware AAF". Equivalent to "construction permit")
Obtaining the Approval for the Operation & Security Manuals
(we call "Software AAF")

Construction, Fabrication
Inspection for the facilities and equipment by the reactor owner

Regulatory Audit for the Owner's Inspection Results
(Equivalent to Operation License in conjunction with 2nd STEP's regulatory approvals)

Green Lamp of Facility Operation
(After starting operation,
it is necessary to respond to ROP.)

Note: In Japan, ROP (Reactor Oversite Process) is also applied to research reactors.

# Main Submittal items regarding to the facility license

| NRA Secretariat Division | Permission | Approval | Audit |
|---|---|---|---|
| Licensing Division<br><br>Research reactor team | • ICPAF | • Hardware AAF<br>➢ LEU fuel plate Fabrication<br>➢ New Storage Fabrication<br>➢ LEU Core Assembling<br><br>• AAF for Safety Manual | |
| Oversight Division<br><br>Specified oversight team | | | • Post-Audit for POI<br>➢ LEU fuel plate Fabrication<br>➢ New Storage Fabrication<br>➢ LEU Core Assembling<br><br>• Audit for PIU Approval<br>➢ LEU Core Assembling |
| Nuclear Security Division | | • AAF for Security Manual | |

In addition, there are safeguards-related and transport-related regulatory procedures.

# Regulatory sectors regarding the LEU conversion tasks

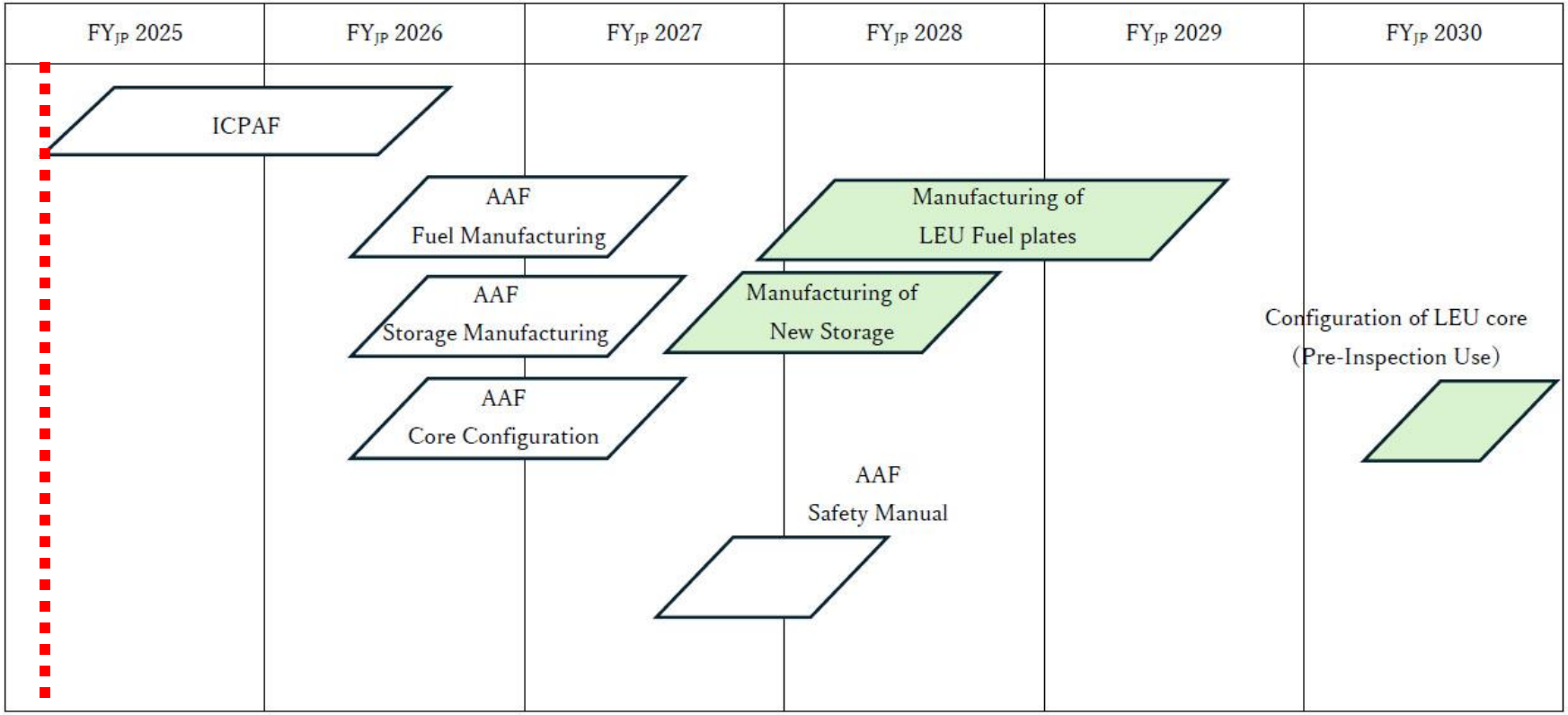
| | Regulatory Steps | Regulatory Sector in charge |
|---|---|---|
| Facility/Equipment related | Permission for the Design Policy | Research reactor review team (NRA) |
| | Approval for Detail Design & Fabrication | Research reactor review team (NRA) |
| | Post-Fabrication Audit | Research reactor inspection team (NRA) |
| | Approval for the Updated Security Manual | Research reactor security team (NRA) |
| | Approval for the Updated Operation Manual | Research reactor review team (NRA) |
| | Notification of change in nuclear materials | Safeguard team (NRA) |
| Transportation related | Technical approval for the transport containers | Transportation team (NRA) |
| | Technical inspection for the transport containers | Transportation team (NRA) |
| | Planning for transportation at Sea | Maritime Bureau (MLIT), JCG |
| | Planning for transportation on Land | Road Bureau (MLIT), NPA |

**Implementing the LEU conversion requires negotiations with a lot of regulatory sectors.**

# Organizational structure for the LEU conversion work

- In addition to the Regular Reactor Management Unit, Kindai University has also organized a Support Unit to handle licensing and approval procedures.
- The Support Unit consists of the facilities-related division and the transportation-related division.
- The NRA review interview will be handled by the Regular Reactor Management Unit, but the preparation of necessary documents will be carried out in cooperation with the Support Unit.
- Kindai University is working with Argonne National Laboratory HEU conversion team, Chiyoda Technol corporation, and others to prepare ICPAF submission.

# Overall schedule and current position




**NOW, We are Here !**

We plan to submit ICPAF to the NRA by the end of June.