Technical Meeting on Lessons Learned from the Russian Research Reactor Fuel Return (RRRFR) Programme

Samarkand, Uzbekistan *3-5 June 2015*

FINAL STAGE of Preparation for Removal of Liquid SNF of IIN-3M Reactor

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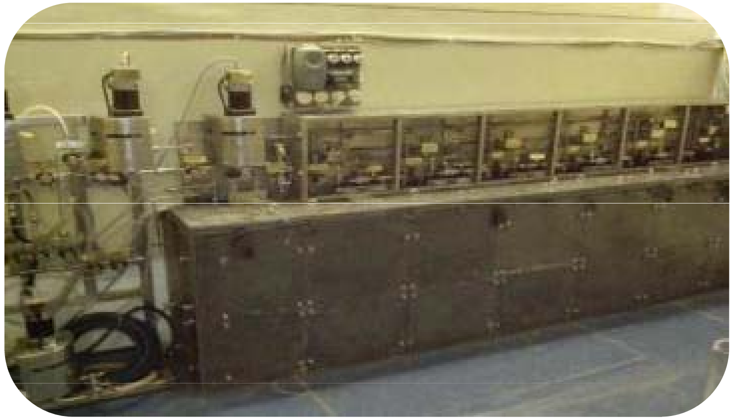
SNF of FOTON IIN-3M reactor

Uranyl sulphate solution ($UO_2SO_4 + H_2O$):

- discharged from the reactor into the interim storage canisters – 25 l;
- located in the isotope storage room – 1.1 l.



Tasks Assigned in 2014 and Their Status in 2015

	Task	Status (2015)
1	Discharge the LSNF from the reactor into interim storage canisters. Inspect the LSNF	Completed in September 2014. Completed. Inspection Report is issued
2	Obtain approval of modifications to Mayak's license conditions for reprocessing the Foton IIN-3M reactor LSNF	Completed
3	Fabricate and deliver equipment for loading LSNF into TUK-145/C packaging	Completed. All equipment is mounted and tested
4	Ratify the Gov-to-Gov agreement. Obtain a positive state ecological assessment of the Unified Project	Completed. Procedure to obtain the state ecological assessment of the Unified Project has started

Russian Technical Support

Fuel Characterization

- ❖ Report O-560-07 on SNF inspection procedure is approved
- ❖ Report O-607-07 on SNF inspection completed is approved

RF Certificate of Approval for Package Design and Shipment

- ❖ Nuclear Safety Assessment Report No.13-152 for TUK-145/C is approved
- ❖ Certificate RUS/3197/B(U)F-96T for TUK-145/C is approved (expired on April 18, 2015)

Permits for transportation of SNF-containing packages

- ❖ Technical Specifications for Delivery СТВА.Д.64.007ТУ are approved
- ❖ Special Requirements to Air Shipment 1011-60/14 are approved

RF Certificate of Approval for SKODA VPVR/M Package Design and Shipment

- ❖ Nuclear Safety Assessment Report No.14-033 for SKODA VPVR/M is approved
- ❖ Certificate RUS/3205/B(U)F-96T for SKODA VPVR/M is approved (valid till June 16, 2015)

Extension of RF Certificate of Approval for Package Design and Shipment

- ❖ Certificate RUS/3197/B(U)F-96T (Rev.1) for TUK-145/C is approved (valid till May 25, 2018)
- ❖ Technical Specifications for Delivery СТВА.Д.64.010ТУ are approved
- ❖ Special Requirements to Air Shipment 1011-60/14 are approved

Planned Work → **Assemble the package and ship the LSNF in TUK-145/C by air**

Discharge and Interim Storage Equipment

LSNF Discharge

Work completed (100%):

- Design the equipment
- Analyze safety
- Fabricate and deliver the equipment
- Develop the procedure; educate and train the personnel
- Mount the equipment
- Discharge the LSNF from the reactor

СОСНЫ

НАУЧНО-ПРОИЗВОДСТВЕННАЯ ФИРМА «СОСНЫ»

УТВЕРЖДАЮ

С.В. Комаров

« 15 » 12 2014

ТЕХНИЧЕСКИЙ ОТЧЕТ

РЕЗУЛЬТАТЫ ИНСПЕКЦИИ ОЯТ ИССЛЕДОВАТЕЛЬСКОГО РЕАКТОРА ИИН-3М, ЗАЯВЛЕННОГО К ВЫВОЗУ В РОССИЙСКУЮ ФЕДЕРАЦИЮ

по контракту № 2013-05

СОГЛАСОВАНО

Директор Института ядерной физики Академии наук Республики Узбекистан

У.С. Салихбаев

« 15 » 12 2014

СОГЛАСОВАНО

« 05 » 12 2014

Главный инженер

Г.С. Абдуллаев

« 11 » 12 2014

А.И. Гоголев

« 03 » 12 2014

Димитровград 2014

On September 12, 2014 all LSNF was discharged from the reactor into interim storage canisters, and then inspected

Transport Canisters and Procedure for Their Loading into SKODA VPVR/M Cask

Work completed:

- Develop the procedure and design the equipment to load canisters with LSNF into SKODA VPVR/M cask
- Fabricate and deliver the equipment
- Mount the equipment at JSC Foton
- Educate and train the personnel

Planned Work

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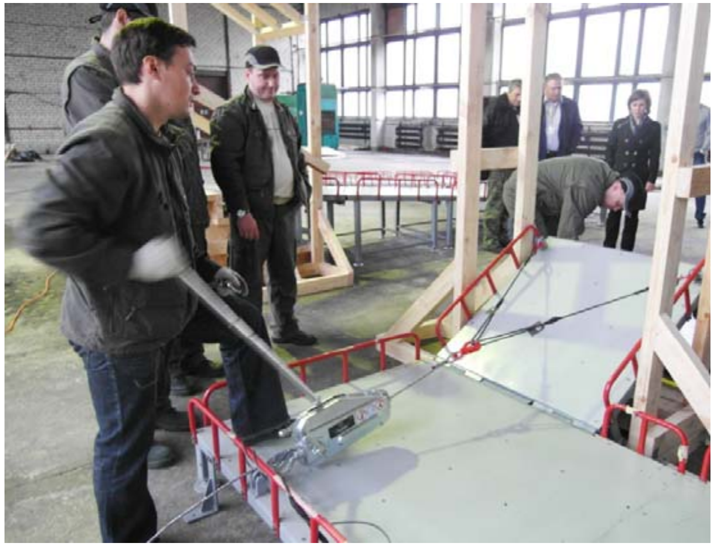
Technical support during LSNF loading into canisters and then into TUK-145/C

Fabrication and Dry Run of Equipment for LSNF Loading into SKODA VPVR/M Cask



Dry Run of 1st Batch of Equipment to Verify Its Compatibility with SKODA VPVR/M Cask

Czech Republic, UJV Rez, November, 2014

Adaptation of JSC Foton Site for Loading SKODA VPVR/M Cask

Deck is enlarged and reinforced

Concrete ground is prepared

Mounting and Dry Run of 2nd Batch of Equipment at IIN-3M Reactor Site





Training of IIN-3M Reactor Personnel in LSNF Loading into SKODA VPVR/M Cask

Tashkent, JSC Foton, January-March, 2015

Radiation Safety

Operation	EDR in reactor hall center, µSv/h	EDR at working place (on the surface/ at a distance of 1 m), µSv/h	EDR on the surface of valves mouted on a rack, µSv/h
Fill E1	2	– / 12	260
Fill E2	4.9	–	–
Fill E3	5.6	135.0	–
Fill E4	6	230 / –	–
Fill E5	7.5	274 / –	500
Fill E6 (1l)	6.7	97 / –	–
Wash up the system with distilled water	–	–	50

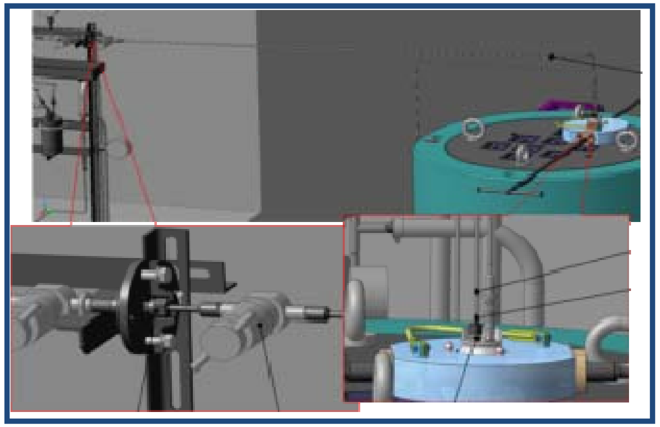
When the dosing canister is full, the radiation control sensor reading is 8160 µSv/h. Calculated EDR in the point of radiation control sensor location in case of full dosing canister is 9303 µSv/h.

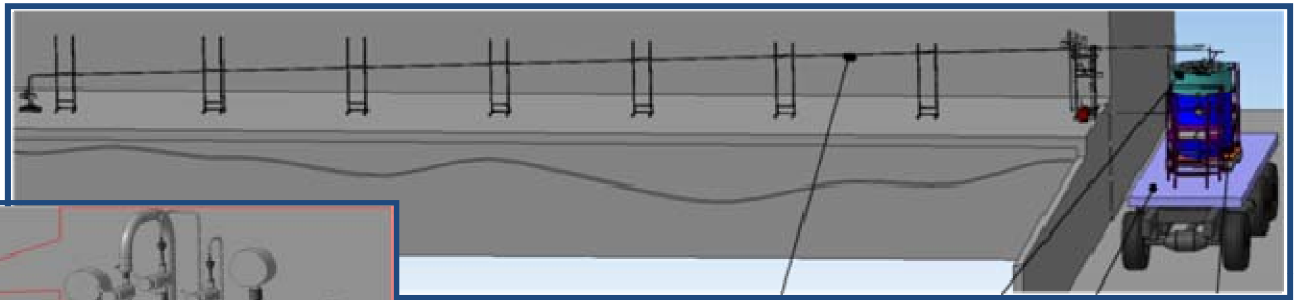
Transport Plan for Shipping Liquid SNF from Uzbekistan to Russia

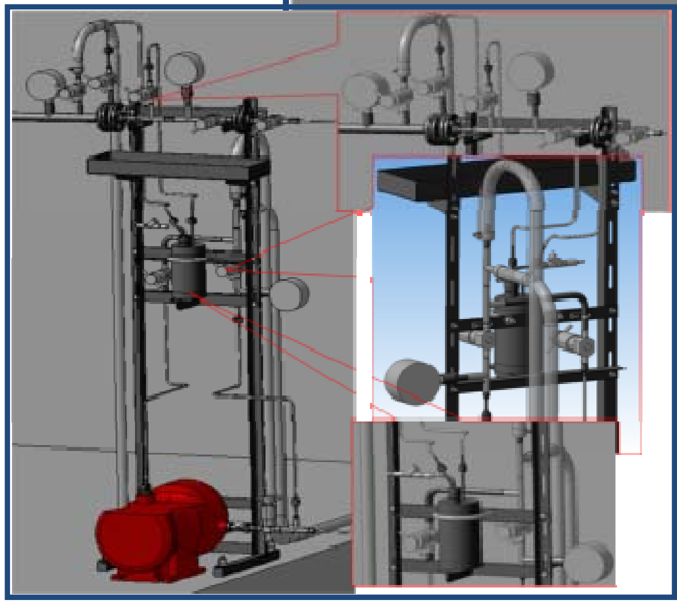
Consignor	Airport (Uzbekistan)	Airport (Russia)	Radioachemical Plant
Load ISO containers with SKODA VPVR/M cask and auxiliary equipment on trucks	*Assemble TUK-145/C and load a truck with TUK-145/C in an aircraft*	*Reload the truck with TUK-145/C from the aircraft*	*Receive SNF-containing TUK-145/C*

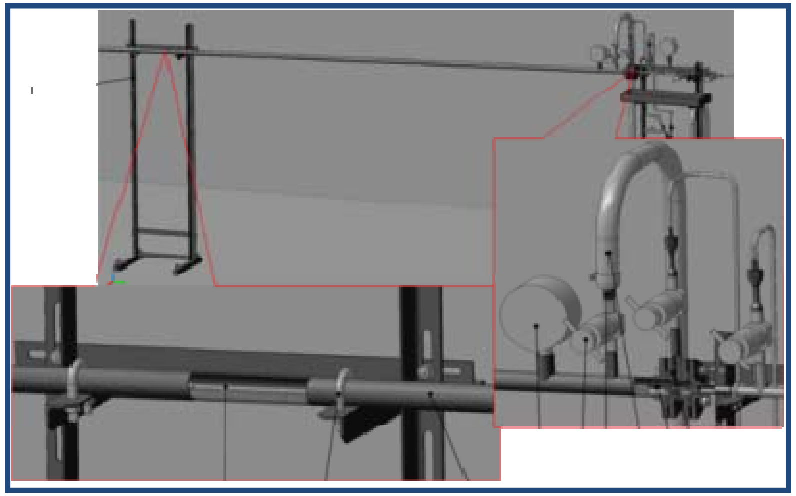
Technology for Uranium Extraction at Mayak PA

- Receipt technology development
- Equipment designing
- License modifying
- Equipment fabrication
- Equipment commissioning









CONCLUSIONS

Main results:

- The liquid SNF was discharged from the reactor into equipment for its interim storage. The discharged LSNF was inspected.
- Russian shipment permits (Certificates, Technical Specifications, Special Requirements to Air Shipment) are extended.
- Approval of modifications to Mayak's license conditions for reprocessing the Foton IIN-3M reactor LSNF is obtained.
- The equipment for the LSNF loading into TUK-145/C at JSC Foton and for the LSNF receipt at Mayak PA is fabricated and delivered.
- The Gov-to-Gov agreement is ratified.

Only obtainment of a positive state ecological assessment of the Unified Project is necessary to remove the LSNF from Uzbekistan.

Thank you for attention!

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