

## **Nuclear Waste Management Treatment Facility and Spent Fuel Storage at the Ignalina Nuclear Power Plant – 9192**

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### **ABSTRACT**

In January 2005 NUKEM Technologies GmbH in a consortium with GNS Gesellschaft für Nuklear Service mbH (GNS) was awarded the turnkey contract for an Interim Spent Fuel Storage Facility (B1-ISFSF). December 2005 NUKEM Technologies GmbH signed the turnkey contract for the erection of the New Solid Waste Management and Storage Facilities (B234-SWMSF). Both projects are part of the decommissioning program of the Ignalina Nuclear Power Plant (INPP), Lithuania.

The paper provides information about technical details and the actual status of the B1-ISFSF and the B234-SWMSF projects.

### **INTRODUCTION**

The Ignalina Nuclear Power Plant (INPP) is situated in the north-eastern part of Lithuania close to the borders with Latvia and Belarus and on the shore of Lake Druksiai. It is approximately 150 km from the capital city Vilnius. The power plant has two RBMK type water cooled graphite moderated pressure tube reactors each of design capacity 1,500 MW(e). The start of operation of the Unit 1 was in 1983 and Unit 2 in 1987, when Lithuania was still a part of the former Soviet Union.

One pre-condition for Lithuania to join the European Union (EU) in 2004 was to shut down the INPP. To fulfill this requirement, a decommissioning program was initiated, which consists of several projects. These projects are financed by the European Bank for Reconstruction and Development (EBRD).

In 2005 NUKEM Technologies signed contracts for two of these decommissioning projects with INPP – one in January 2005 in a consortium with GNS for the erection of an Interim Spent Fuel Storage Facility (B1-ISFSF), the second in November 2005 for the erection of the New Solid Waste Management and Storage Facilities (B234-SWMSF). Both are turnkey projects and include the design, manufacture, supply, erection, installation setting-to-work, commissioning, and other items, services and documentation.

### **INTERIM SPENT FUEL STORAGE FACILITY (B1-ISFSF)**

#### **General Project Description**

The INPP Unit 1 was shutdown for decommissioning on December 31, 2004 and the Unit 2 is scheduled to be shut down by end of 2009. As for the decommissioning of INPP the reactor units have to be defuelled completely, and the capacity of the existing spent fuel store is insufficient to store all of the spent fuel which will be generated prior to and at closure a new store is provided which will have a capacity of approximately 17,100 fuel assemblies.

In addition the scope includes all necessary equipment for spent fuel retrieval, packaging, sealing, transport and other equipment appropriate to the design solution and required for the safe removal of the existing spent fuel from the storage ponds at the INPP Units and insertion into the new ISFSF.

A small proportion of the spent fuel has suffered damage which is minor (without loss of integrity of the cladding) or major (potential for rupture of the cladding). It is necessary that this damaged fuel is also retrieved from the storage pools and stored in the new B1-ISFSF.

The B1-ISFSF site is immediately adjacent to construction site of the second project – the Solid Waste Treatment and Storage Facilities (B34-SWTSTF). The intention of INPP is to combine B1-ISFSF and B34-SWTSTF sites into one single site after construction of the respective facilities with a common infrastructure (e.g., common physical protection and site security arrangements, common radiation and environmental monitoring, fire protection arrangements, etc.) and to establish a Nuclear Waste Management and Interim Spent Fuel Storage Center.



**Figure 1: Layout of B34-SWTSTF (1) and B1-ISFSF (2) sites**

The following main design criteria for the new B1-ISFSF have to be fulfilled:

- Interim Storage of spent fuel assemblies for at least 50 years,
- Possibility of retrievability of spent fuel,
- Two independent barriers to prevent the release of radioactive material to the environment, whereas the fuel cladding shall not be one of the barriers,
- Criticality safety  $k_{\text{eff}}$  less than 0.95,
- Nuclear and radiation safety in accordance with national and international standards.

### **The Storage Cask CONSTOR<sup>®</sup> RBMK1500/M2**

The fuel will be stored in CONSTOR<sup>®</sup> casks, which are designed and will be manufactured and delivered by NUKEM Technologies GmbH's consortium partner GNS. The casks have a thick-walled cylindrical body comprising two steel tubes welded to a massive steel head ring. The inter-space is filled with heavy

concrete. The lid-system is a bolted primary lid, a welded seal plate and a welded secondary lid. During facility operations temporary sealing is achieved with two elastomer gaskets until final welding of the containment is carried out.

The seal plate and the secondary lid are welded using multi-pass full-thickness welds to the cask body. A qualified automatic welding process is used, followed by ultrasonic testing. This ensures long-term leak-tightness and accident resistant closure of the cask.

The design of the CONSTOR<sup>®</sup> cask complies with the IAEA requirements for B(U)F packages and provides the option of achieving Competent Authority certification for spent fuel assembly transport on request.

The CONSTOR<sup>®</sup> RBMK cask is licensed for long-term storage of RBMK spent fuel assemblies by the Lithuanian Authority VATESI.

Currently, approximately 60 CONSTOR<sup>®</sup> RBMK are already loaded with 51 spent fuel assemblies each and placed into the existing storage facility at INPP.

The casks which will be delivered for the new B1-ISFSF, the CONSTOR<sup>®</sup> RBMK1500/M2, are modified as compared with the already delivered casks. The modified design has the advantage, that small changes in the dimensions will bring 80% higher storage capacity for each cask. This higher storage quantity is achieved by the accommodation of two baskets: the inner basket (“32M basket”) provided by INPP and as already used for the existing 60 casks having a capacity of 51 fuel assemblies and the outer ring basket, which is part of the CONSTOR<sup>®</sup> RBMK1500/M2 and which has a capacity of 40 fuel assemblies. One RBMK fuel assembly consists of two fuel bundles, which are separated before loading into the 32M basket and which is a standard operational process at INPP. The fuel bundles from the inner basket will be loaded into the outer ring basket under water at the spent fuel storage pool.

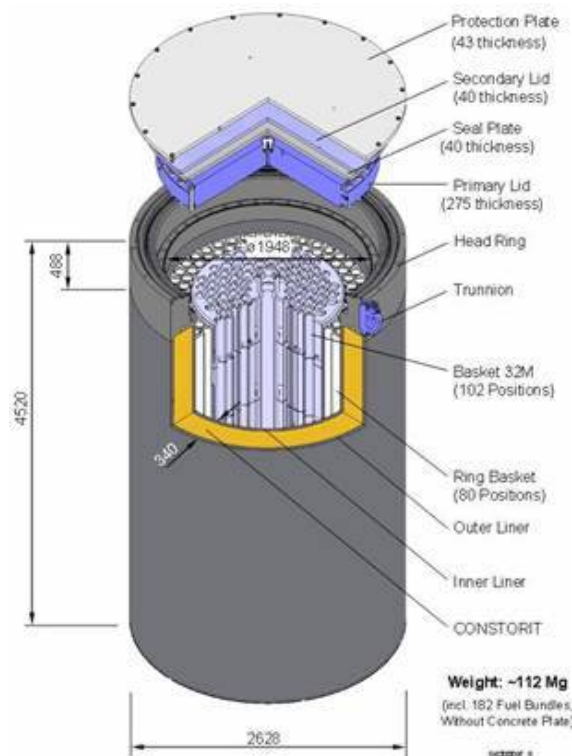


Figure 2: View of the CONSTOR<sup>®</sup> RBMK 1500/M2 cask

### Fuel Bundle Handling Equipment (FBHE)

The fuel transfer from the inner basket to the outer ring basket will be performed by a new fuel bundle handling machine. The main tasks of this machine within are the safe removal of spent fuel bundles from the inner basket temporarily inserted into a CONSTOR<sup>®</sup> RBMK1500/M2 cask, followed by the safe placement of spent fuel bundles into the ring basket of the CONSTOR<sup>®</sup> RBMK1500/M2.

The partially emptied inner baskets are taken from the cask and transferred to the pool, from there they can be moved into the existing Hot Cell at INPP to be refilled, and will be replaced by an inner basket, filled with 51 fuel assemblies. This process step is required as the inner basket holds 51 fuel assemblies and the ring basket of the cask holds 40 fuel assemblies.

After closing with the primary lid, lifting, drying, etc. the cask is transferred via railroad to the new site of the B1-ISFSF.

### Storage Facility

The new interim store will be erected adjacent to the INPP (about 1 km). The approximate site dimensions are 300 m × 100 m. The B1-ISFSF main storage building is constructed for the preparation and for interim storage of 201 CONSTOR<sup>®</sup> RBMK1500/M2 casks. It includes necessary auxiliary structures for casks reception control, site physical protection, site and personnel service, etc.

Three basic areas are at the main storage building: Reception Hall, Storage Hall, and Fuel Inspection Hot Cell (FIHC). Cask transfer corridor, Cask Service Station (CSS), Control room, Personnel entrance and exit, Dosimeter room, IAEA inspection room, and other auxiliary rooms are located in the Reception Hall.

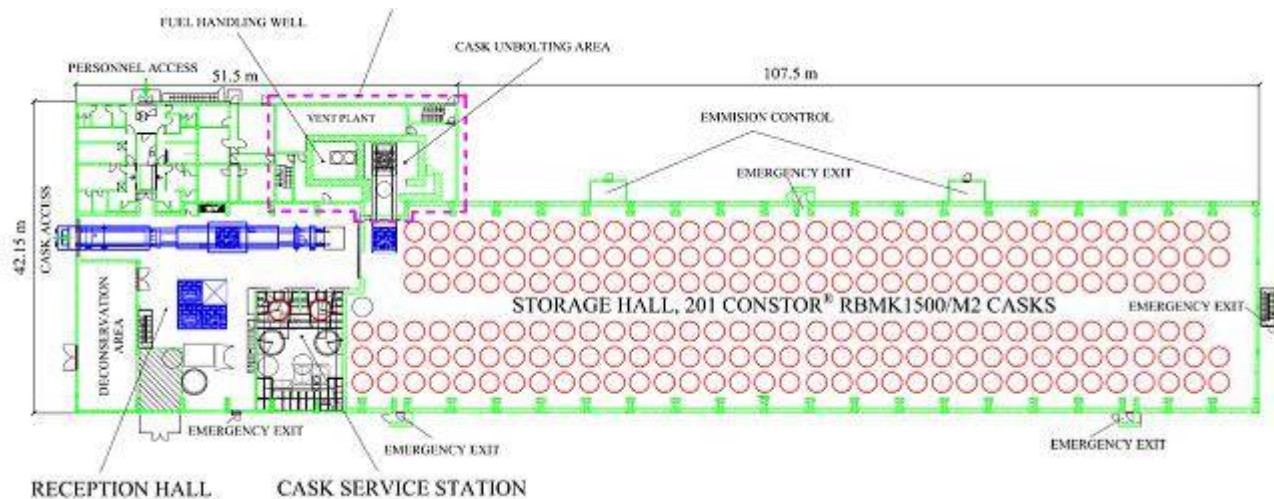


Figure 3: Layout of the main storage building

Inside the main storage building (Reception Hall and Storage Halls) the cask transfer operations are performed by an overhead crane with a suitable vertical traverse. The crane is remote-controlled using operator view, cameras and a cask position locating support system. The rail road transporter with the loaded cask closed with primary lid and protective plate arrives in the Reception Hall. The overhead crane

transports the cask to a CSS, where the cask is finally closed by welding a seal plate and a secondary lid onto the cask. After the required checks, the cask is transported by the overhead crane to the Storage Hall and the cask is vertically placed in the storage location.

The Storage Hall serves for storing of the loaded casks and of the empty casks from the arrival at the B1-ISFSF to the transfer to one of the Reactor Units. The Storage Hall, integrated into the main building construction, has the same wall and floor slab conditions as the Reception Hall. The Storage Hall is separated from the Reception Hall by a shield wall with a sliding shield door for moving the casks in and out. The removal of decay heat is achieved by natural convection through openings on the side and the top of the Storage Hall.

The FIHC serves for inspection and repackaging of the spent nuclear fuel in the very unlikely event, that a cask seems to be defective and needs to be unloaded. The thickness of the external walls of the FIHC is sized to optimize doses for operating personnel and general public and not to exceed dose constraints. FIHC ventilation extract system comprises a duty and standby fan arrangement. The duty fans accommodate operations within the FIHC during SNF inspection and repackaging procedures and generate the necessary negative pressure within the FIHC. The standby fans allow the FIHC ventilation to be reduced during times when the cell is not in use and does not contain fuel, whilst still maintaining a nominal negative pressure within the FIHC. The FIHC ventilation extract system utilizes primary and secondary HEPA filters positioned within a local ventilation plant room, external to the FIHC. The exhaust air after filtration is discharged via a dedicated exhaust stack.

### **Damaged Fuel Handling System**

Approximately 400 fuel assemblies with cladding leakage (“untight fuel”) and approximately 130 mechanically damaged fuel assemblies which require to be processed are anticipated after the INPP shutdown. In addition to the damaged fuel assemblies, some experimental fuel assemblies (they are approximately ~10 m, ~16.3 m and ~17 m in length) require also to be processed.

The “untight fuel” will be processed in a similar way as the undamaged fuel, i.e. the fuel bundles are separated using the existing equipment INPP in the existing hot cells at Units 1 and 2. To ensure the drying of the casks, the number of untight fuel assemblies per cask is limited to 15, which are disposed-of without any overpacks into a cask.

The mechanically damaged fuel assemblies and experimental fuel assemblies are prepared before handling and / or processed within the ponds using existing and / or new tools. The mechanically damaged fuel assembly is also separated into two fuel bundles. Each of these fuel bundles is overpacked into a cartridge. Possible fuel debris are collected by a new fuel debris collection system in the ponds and are also overpacked in special cartridges. Up to 36 cartridges with mechanically damaged fuel bundles or debris are disposed-of into one cask, equipped with a special damaged fuel basket.

## **NEW SOLID WASTE MANAGEMENT AND STORAGE FACILITIES (B234-SWMSF)**

### **General Project Description**

The new SWMSF provides a modern solid radioactive waste management and storage system for existing, future operational and decommissioning waste. It complies with the Lithuanian legislation requirements and also brings management of radioactive waste in Lithuania in compliance with radioactive waste management principles of IAEA and with good practices in force in European Union Member States.

The new SWMSF is designed and constructed for the purpose of retrieving, transferring, presorting, sorting, treating (as applicable), packaging, characterization and storage of:

- Short and Long-Lived solid radioactive waste currently stored at the INPP site;
- Operational solid and combustible liquid radioactive wastes that will be produced by INPP until the final closure of Unit 2;
- Solid radioactive waste from decommissioning produced by INPP.

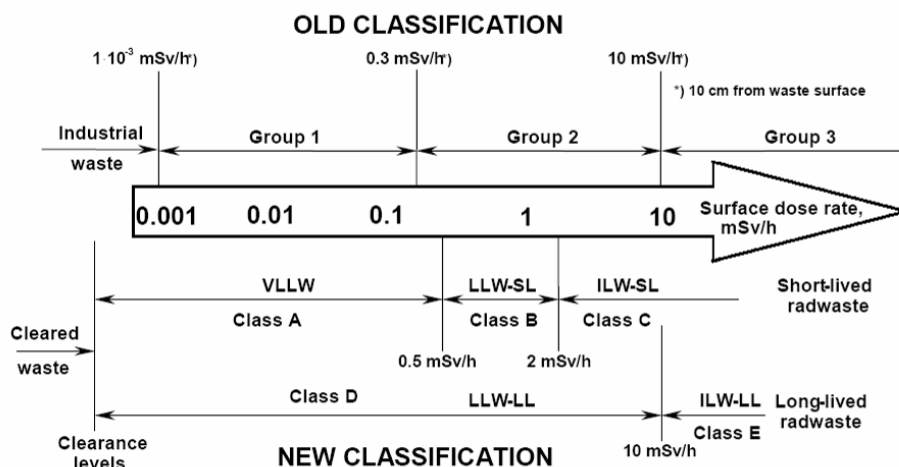
This project (B234) is therefore related to decommissioning of INPP and can be divided into three main parts:

- B2 (involves waste retrieval from existing storage buildings, landfill separation facility and waste transfer);
- B3 (involves waste treatment);
- B4 (involves waste storage).

The Solid Waste Retrieval Facility (SWRF) mainly comprises Retrieval Units (namely RU1, RU2 and RU3), the Landfill Separation Facility (LSF) and the Control Building. All normal retrieval and presorting operations are performed remotely, and only unusual waste, equipment failure, emergencies, and normal maintenance require human intervention. Exception is LSF where due to low waste activity presorting mostly is done manually.

The Solid Waste Treatment and Storage Facility B34 (SWTSF) is built on a new site at about 0.6 km to the south from INPP perimeter. A radioactive Waste Transfer System (WTS) is established in between INPP and SWTSF sites for transfer of retrieved waste from Solid Waste Retrieval Facility, for operational waste from Unit 2 and for waste produced by decommissioning of INPP.

The Solid Waste Treatment Facility (SWTF) houses equipment and facilities necessary for the treatment of the solid radioactive waste. The design for the SWTF is based on different sorting cells and subsequent waste processing facilities. In the sorting cells the waste is processed in parallel streams according to its respective radiological properties. Then sorting, size reduction and other preparations take place prior to incineration, high force compaction and/or grouting.

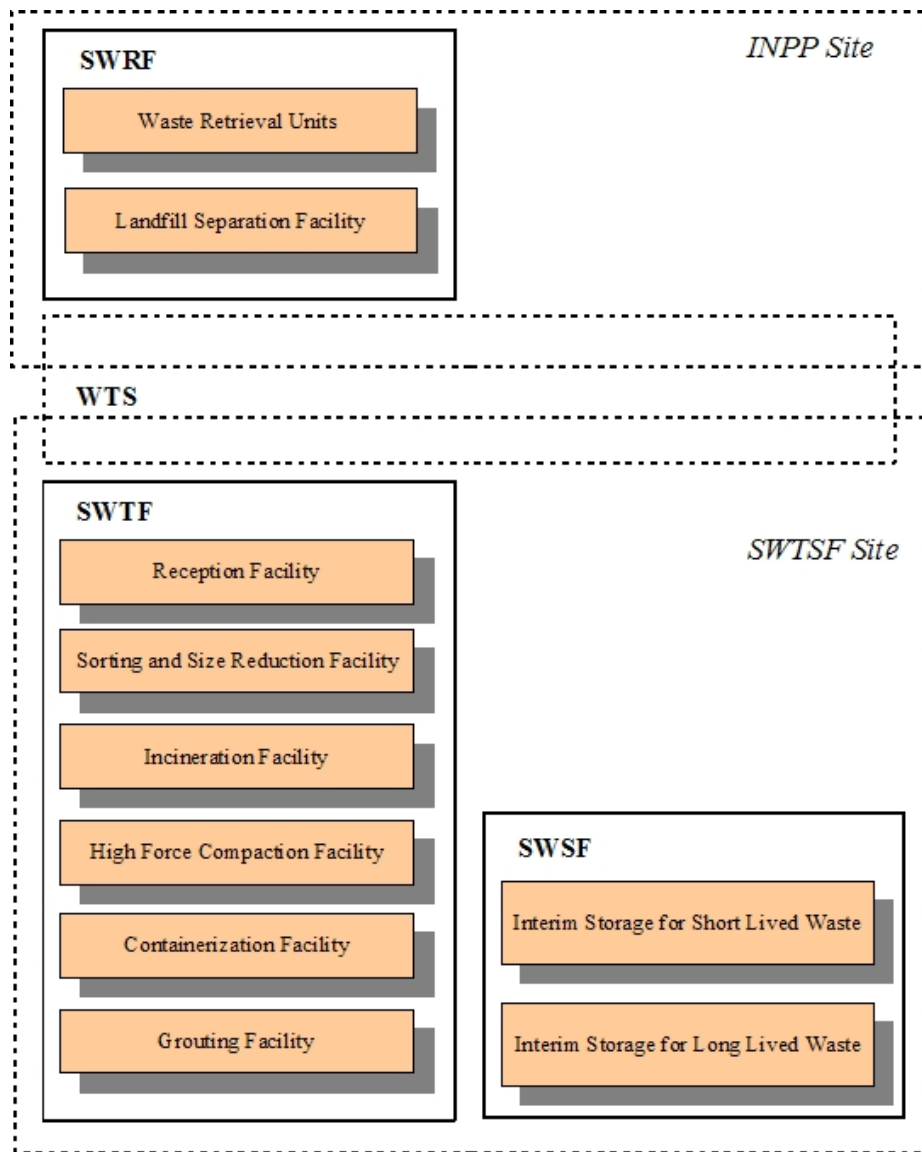


**Figure 4: Classification of Waste according to old classification (G1 - G3) and new classification (A - F)**

One of the main requirements of the B234 project is the re-categorization of the waste from the old classification (G1 – G3) to the new classification (A-F). The waste is re-categorized during the sorting process from Class A to Class F according to its ultimate destination:

- Class A waste: very low-level for Landfill disposal
- Class B and C waste: low and intermediate-level for short-lived (SL) intermediate storage;
- Class D waste: low-level waste and graphite for long-lived (LL) intermediate storage;
- Class E waste: intermediate-level waste for LL intermediate storage;
- Class F waste: spent sealed sources for LL intermediate storage.

The Solid Waste Storage Facility (SWSF) comprises two stores, which are directly connected to the SWTF: one store for Short-Lived (SL) and the other for Long-Lived (LL) waste.



**Figure 5: Concept of the new Solid Waste Management and Storage Facility (SWMSF) at Ignalina NPP**

## **Solid Waste Retrieval and Segregation**

The Retrieval Unit 1 (RU1) of the Solid Waste Retrieval Facility (SWRF) is constructed as a side structure to existing INPP waste storage buildings. Appropriate containment is provided for sealing RU1 against the waste storage buildings. Ventilation systems maintain the operational area at a depression relative to the outside environment to prevent contamination escaping. Waste retrieval is achieved by using two remotely operated vehicles (ROV) which enter the waste storage compartments via access apertures cut in the side of the waste buildings.

Preliminary waste sorting is undertaken in RU1 pre-sorting area, allowing spent sealed sources (SSS), filters or other special waste to be identified, directly separated, packed into transport container and sent to the SWTF. Waste, which is too large for the transport containers are cut using fitted tools. Other Group 1 (G1) waste is routed to the LSF. G1 waste retrieved from other waste storage buildings is also transferred to and sorted in RU1 pre-sorting area.

Landfill Separation Facility (LSF) is built against the RU1 building. The landfill separation facility is designed for treatment and characterization of low active waste of landfill type. The activity of low active waste will be estimated by dose rate measurement. In addition there are gamma spectroscopy measurements provided by NaI detectors. From these measurements beta/gamma activities are taken. For end declaration the monitoring systems with HPGe detectors are used. The main purpose of LSF is to separate class A waste (i.e. Landfill waste) from the other G1 solid waste, pack the waste appropriately and load it into standard 20' half height ISO containers for transfer to Landfill repository. G1 waste which does not meet WAC (waste acceptance criteria) for a Landfill is placed into a G1 transport container and transferred to the SWTF for further treatment. Bale press to compact a compactable waste and scrap press to compact bulky metal items are installed in the LSF.

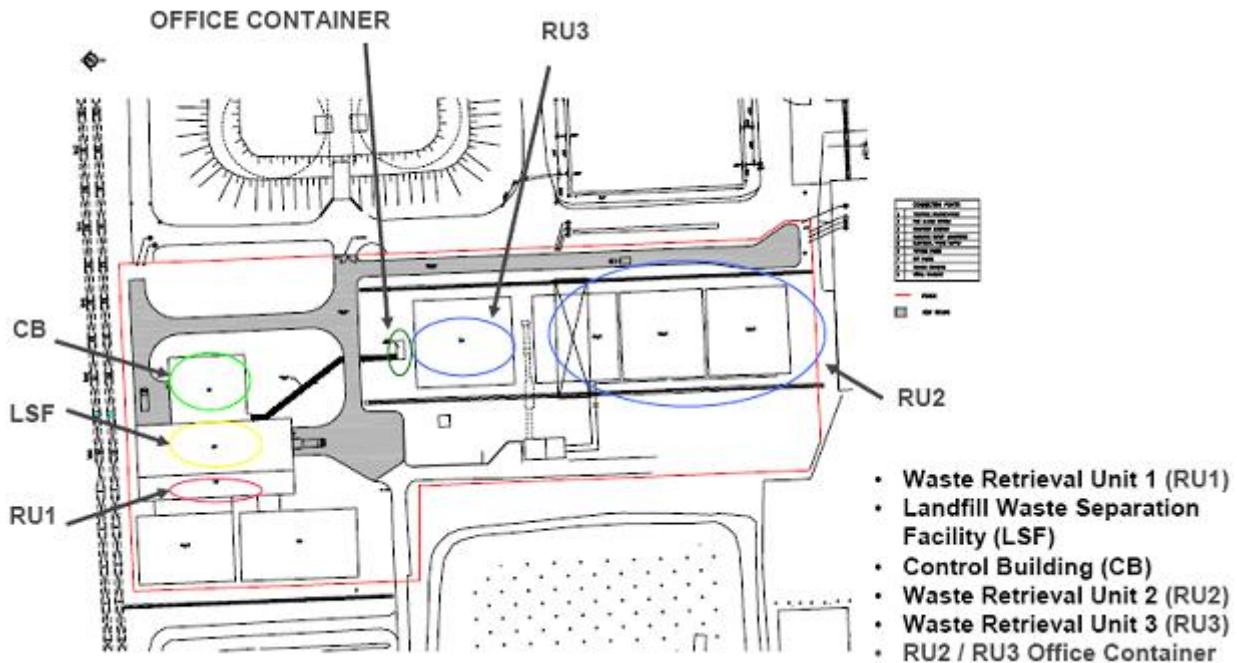
RU2 is used to retrieve, pre-sort and pack G1 and G2 waste from existing INPP waste storage buildings. RU2 is a mobile unit located on top of the building and appropriately fixed to the building structure. The waste from the storage compartments is retrieved through existing waste loading apertures. Initial waste retrieval is undertaken by a dedicated crane and grab. Once the crane has recovered all accessible waste, an ROV is lowered into the compartment to load the remaining waste into a skip operated by the crane.

RU3 is used to remove the Group 3 (G3) waste from two compartments of the existing INPP waste storage buildings. Similar to RU2, the RU3 is a mobile unit located on top of the building and appropriately fixed to the building structure. Due to high G3 waste activity only appropriately shielded, automatic and remotely controlled waste retrieval and loading are implemented. G3 waste is placed in appropriate waste containers without pre-sorting for onward transport to the SWTF.

The retrieval operations are managed from a Control Building using displays to provide the ROV pilots with perception of the recovery area operations. The control room also liaises with the SWTF to coordinate the dispatch and return of the waste containers and has radio contact with the transport drivers, ensuring safe, efficient and controlled waste transfer operations.

Control Building comprises also common facilities like personnel access control, changing rooms, sanitary facilities, interfaces with other INPP supplies like electricity, compressed air, telephone, etc. Control Building is built adjacent to the Landfill Separation Facility, in a position where it allows easy access to the RU.





**Figure 6: Conceptual layout of SWRF**

### Waste Transfer

All transportation will be performed within supervised area and without entering public roads. A fenced road connection will be constructed to connect INPP and SWMSF sites. The road connection will be constructed aside the new railroad connection (which will be used for spent nuclear transfer from INPP to Interim Spent Fuel Storage Facility site).

To provide flexibility and allow efficient use of equipment, the transfer of the waste will be performed using tractor fitted with appropriate flatbed trailer. All transfer operations will be controlled and coordinated by the Control Room, which will have communication links to the other facilities.

Radioactive waste transfer within existing INPP supervised area includes:

- Solid G1 waste transfer from RU2 to RU1 for segregation of Class A waste suitable for Landfill disposal. This waste transfer is performed internally within SWRF site and is short distant;

Radioactive waste transfer in between INPP and SWTF sites includes:

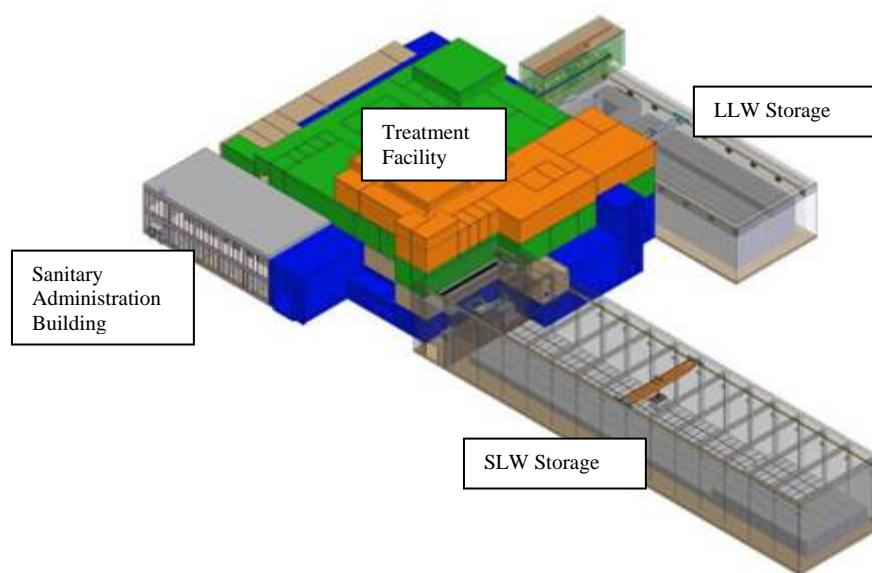
- Solid G1, G2 and G3 waste transfer from SWRF to SWTF;
- Liquid waste transfer.

### Solid Waste Treatment

The SWTF comprises equipment and facilities necessary for the treatment of the solid radioactive waste. In terms of functions the SWTF provides the following:

- Reception of solid radioactive waste from the SWRF, operational and decommissioning solid radioactive waste from the INPP as well as waste oil from the INPP;
- Sorting and assaying of the incoming waste according to radiological and physical characteristics;
- Size reduction where necessary;

- Incineration where applicable;
- High force compaction where applicable;
- Containerization;
- Grouting;
- Waste Product characterization;
- Waste transfer to the dedicated interim storage facilities of SWSF.



**Figure 7: General layout of the Solid Waste Treatment and Storage Facility**

#### Waste Reception

There are three areas, within the SWTF, where waste enters the facility. The bulk of the waste enters via the main reception area. Minor waste streams (e.g. waste oil), which do not require intensive processing, and pre-characterized waste packages from decommissioning enter via side entrances. The side entrances are used primarily for the delivery of empty drums, consumables and other material (e.g. chemicals).

Waste to the main reception area arrives in different containers, separated into G1 (non class A), G2 and G3 categories. The containers are delivered on trailers. The containers are picked up from the trailers and transferred to the unloading stations or if necessary to respective buffer storage areas in the SWTF building. Once emptied, and after the external surfaces have been decontaminated, if needed, the G1, G2 and G3 container is loaded back onto trailers. Due to double door design of unloading stations, no or very low contamination of external surfaces of containers is expected.

The waste reception areas are equipped with the appropriate registration equipment for receipt and identification of the waste (waste tracking system).

#### Waste Sorting and Size Reduction

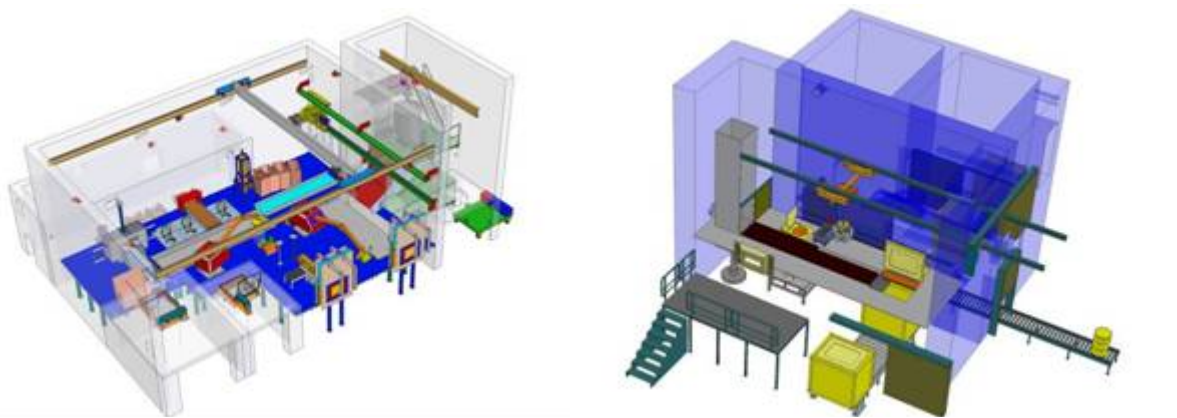
Solid waste sorting and size reduction is carried out in two cells according to waste radiological characteristics:

- G2 sorting cell, for handling of combustible and for non-combustible G1 (non class A) and G2 waste;
- G3 sorting cell, for handling of high active G3 waste.

The G2 sorting cell is a sealed room connected to the active ventilation system to ensure that the cell is maintained at a lower pressure than the surrounding less active rooms.

All sorting operations that take place within the G2 sorting cell are performed using a combination of the cell crane, manipulator arms and Remotely Operated Vehicles (ROV). The operators are able to view the equipment and waste within the G2 sorting cell through lead glass windows and by observing television monitors displaying in-cell camera images. At the monitoring station the activity and weight are measured, any identified “hot spots” are removed before the remaining waste is sorted. Here operators separate SL waste from LL waste, SSS, filters, hazardous waste, graphite, and combustible waste from non-combustible waste using the ROV supported by manipulator arms.

Waste suitable for high force compaction and waste that requires special treatment are also removed and placed through corresponding ports into 200-liter drums. Large items are size reduced. Radioactive ventilation filters are size reduced and put into 200l-drums by means of a Filter Press. Combustible waste is sent to the incineration system.



**Figure 8: Layout of the G2 and the G3 sorting cell of the Solid Waste Treatment Facility**

The G3 sorting cell is also a sealed room connected to the active ventilation system to ensure that the cell is maintained at a lower pressure than the surrounding less active rooms so that the air flows into the more active G3 sorting cell.

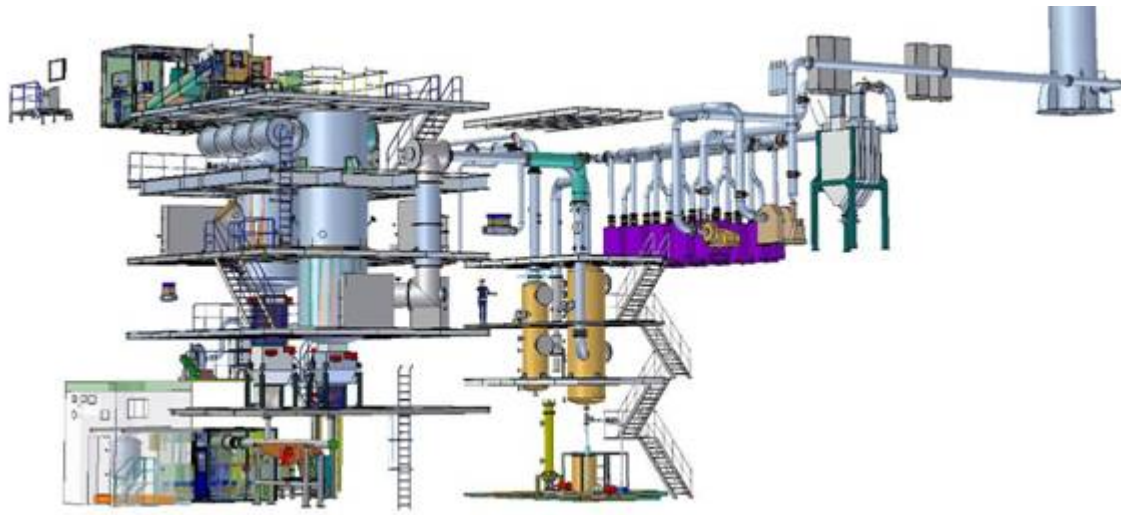
All sorting operations that take place within the G3 sorting cell are performed remotely using a combination of the cell crane and manipulator arms. The cell includes all equipment and devices required for G3 waste import, waste feed buffer storage, class E waste segregation and activity determination, SSS separation, volume reduction of PVC liners, as well as storage container and 200 liter sacrificial drum filling.

### **Incineration System**

The incineration of waste has the advantage to achieve the highest volume reduction possible and convert the organic bulk material into ashes and residues that show higher stability and an inorganic nature which favors subsequent conditioning into waste forms suitable for storage, i.e. high force compacted ashes.

The incinerator's waste feed system and ash management system is adapted to non-manual work

sequences for Class B and C waste handling. The design of the incineration plant includes features to deal with all normal industrial hazards (i.e. hot surfaces) as well as radiological hazards (i.e. radiation dose rates).



**Figure 9: Layout of the incineration system of the Solid Waste Treatment Facility**

### **High Force Compaction of Waste**

The high force compactor applies a force of approximately 15,000 kN to minimize the volume of pretreated waste, which is filled in sacrificial 200-liter drums. Volume reduction rates are in the order of 3 to 7 depending on waste characteristics.

Any residual liquids displaced during drum compaction process are collected by a drain system. When a defined amount is reached the liquid waste is discharged to one of the buffer storage tanks of SWTF. Air or gas with particulates displaced during the compaction process is handled by filter system.

In order to optimize the efficient filling of the LILW-SL containers, a tracking system selects drums in the buffer store according to their radiation levels and the height of the resulting pellet after compression. This ensures best use of the container capacity, as the container's radiation limit is never reached. The number of disposal containers is therefore greatly reduced and minimizes the required disposal space.

### **Containerization of Waste**

Waste is filled into containers for disposal and interim storage at several containerization stations inside the SWMSF, i.e. at the Landfill Separation Facility (LSF), G2 and G3 sorting cells and high force compactor. The waste route and its containerization depend on the waste class.

Before packing the waste into the containers the waste is characterized (weight, nuclide content, dose rate, physical and chemical condition) as necessary. A waste tracking system allows assigning the exact data to each container in which the waste is filled. If a container needs to be inspected or exported to a final disposal site, the database allows all necessary information to be quickly retrieved. The database will support operations for the 50-year life of the store.

An approximate 3 m<sup>3</sup> volume concrete shielded container is used as storage, transport and final disposal

container for SL waste.

The LL waste container is an unshielded steel design of rectangular shape and an approximate volume of 2.5 m<sup>3</sup>, which is a design with the aim to minimize the size of the interim storage for LL waste. Since the container is unshielded, the LL Store building walls are designed to provide the required shielding.

### **Grouting of Short-Lived Waste**

The purpose of the grouting facility is to encapsulate solid waste in disposable containers. The waste to be grouted is either pretreated in the high force compaction facility or directly put into a container (i.e. bulky items). The resulting pellets from high force compaction, or loose scrap material, are delivered in SL waste containers to the grouting facility.

The grouting facility is divided into two main sections, the grout preparation system and the grout delivery and container filling system. Each grout batch is individually prepared. The recipe of grout is designed so that it easily flows and fills-up the container volume with a minimum of voids.

### **Solid Waste Storage**

The Solid Waste Storage Facility (SWSF) comprises two intermediate stores, which are directly connected to the SWTF. Waste packages containing Class B or C waste are stored in the SL waste store. Waste packages containing Class D (low-level waste and graphite), E (highly active scrap) and F (SSS) waste are stored in the LL waste store. Both stores are designed as reinforced concrete structures.

The SL store is capable of containing approximately 2,500 m<sup>3</sup> of processed SL waste (net, without containers, grout, crane space, etc) and allows the waste packages to be stored for a period of 50 years. The store is designed so that it can be extended by the addition of up to three similar modules, so that a total storage volume of 10,000 m<sup>3</sup> can be provided. It is not necessary to shield the whole store building as the SL waste containers are individually shielded.

Waste packages are transported to the SL store by conveyer. A remotely operated store crane, equipped with a suitable grab, then picks up the waste packages from the conveyer and transports them to their allocated storage position.

A maintenance and repair area for the SL store crane and grab is provided.

During storage, waste packages may be visually inspected to confirm the integrity of the container and its external condition. A dedicated inspection area is installed for this activity.

The SL store's air supply is dehumidified to maintain a dry environment within the store building, and minimize container corrosion.

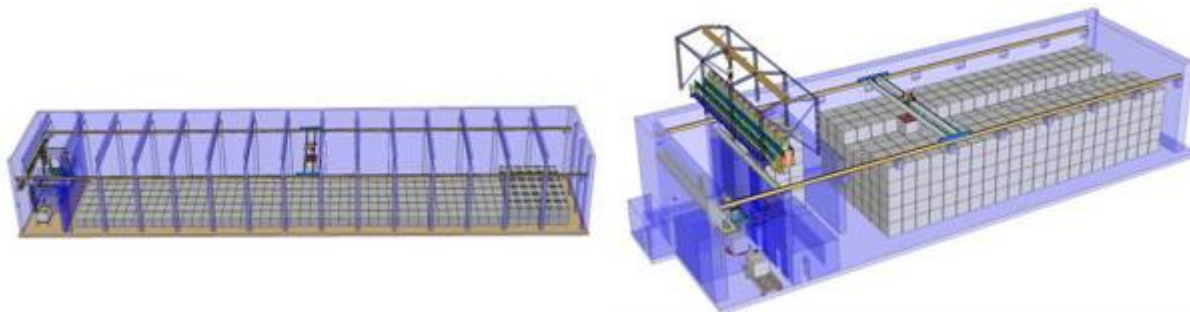
The LL store is capable of containing approximately 2,000 m<sup>3</sup> of LL-waste (net, without containers, crane space, etc) and allows the waste packages to be stored for a period of 50 years. The store is also designed so that it can be extended in modules.

Since the LL waste container is unshielded, the shielding function for the waste is fulfilled by the building structure of the LL store (i.e. substantial shielding walls). Access into the main storage area is therefore not permitted, and any maintenance is undertaken by staff in a specific area of the reception/inspection area, protected by a shielding wall.

Waste packages are transferred to the LL store by conveyor. A remotely operated LL store crane, equipped with a suitable grab, then collects the waste packages from the conveyor and transports them to their allocated storage position.

During storage, waste packages may be visually inspected to confirm the integrity of the container and its external condition. Inspection is carried out through CCTV in a special position inside the LL store where single containers can be transported using the store crane.

An active ventilation system is installed to provide heat removal and air exchange. The air supply is dehumidified to maintain a dry environment within the store building and minimize container corrosion.



**Figure 10: Layout of the SL store and the LL store**

## **CURRENT STATUS OF THE PROJECTS**

Currently the technical design documentation and the preliminary safety analyses are under the review of the Lithuanian Authorities. It is expected, that the construction permissions for both projects will be issued in spring 2009. The commissioning is scheduled to be completed in 2011.