





General view

From 2000 up to 2013 DPMU operated at INPP site.

Western experts and local specialists collaborated for the purpose of INPP decommissioning in order to achieve the main goal: define the way to transform INPP site to the green field.

With this in regards the Final Decommission Plan (FDP) was developed and later the Decommissioning Project was presented.

According to mentioned documents 4 steps to be performed in general:

- Infrastructure Preparation of INPP site
- Spent fuel removal
- Equipment dismantling & decontamination
- Buildings demolition



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General view

There is a significant part of decommissioning work developed for engineering and realizing of D&D works. The B9 series of D&D projects have to be realized along with other projects.

The B9 projects were financed by the International Ignalina Decommissioning Support Fund (IIDSF) with the European Bank for Reconstruction and Development (EDRD) acting as administrator of grant funds provided by the IIDSF.

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Building 117/1 equipment D&D Project. Preparation Phase.

The B9-0 prehistory:

PIS – Project Identification Sheet	2005-2006 y.
PDS – Project Delivery Strategy	2005-2006 y.
TS – Technical Specification Development	2005-2007 y.

Input data collection for project development is the most time-consuming process such as definition of inventories, scope of work, restrictions, interfaces and requirements.

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Building 117/1 equipment D&D Project. Preparation Phase.

The B9-0 prehistory:

EoI – Invitation for Expression of Interest	July 2006
RfP – Request for Proposal (to short listing companies)	November 2006
Evaluation for short-listing of firms responding to the invitation for EoI	March 2007
Evaluation of technical and financial proposals	June 2007
Contract assigned	August 2007

Building 117/1 equipment D&D Project. Engineering. Equipment to be dismantled.



Emergency Core Cooling System Pressure Tanks. Medium parts.

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Building 117/1 equipment D&D Project. Engineering. Equipment to be dismantled.



Emergency Core Cooling System Pressure Tanks and other constructions.

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Building 117/1 equipment D&D Project. Engineering. Equipment to be dismantled.



Emergency Core Cooling System Pressure Tanks. Over part.

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Building 117/1 equipment D&D Project. Engineering. Equipment to be dismantled.



Emergency Core Cooling System pipelines

In total up to 1000 t of equipment had to be dismantled.

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Building 117/1 equipment D&D Project. Engineering. Project development by the Contractor.

Contractor - Consortium Firm:

- British nuclear group (BNG, later VTNS, then BABCOC)
- **NUKEM**
- LEI

The scope of works of the Contractor included:

- D&D strategy development choosing the best option from all currently used methods and instruments for D&D.
- 2. Development of licensing documents:
 - Basic Design (BD)
 - Safety Justification Report (SJR)
 - Environmental Impact Assessment Report (EIAR)



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Building 117/1 equipment D&D Project. Engineering. Project development by the Contractor.

- 3. Other project documentation development:
 - D&D Tools Technical Specifications (TS)
 - Design for Construction Works (DfC)
 - Detail Design
- 4. Licensing support.
- 5. Knowledge transfer.
- 6. Implementation support (if necessary).

B9-0 Contract Price:

Section 1 (Design)	€ 1 783 753,00
Section 2 (Licensing)	€ 233 021,00
Section 3 (Implementation)	€ 79 641,00
Total	€ 2 096 425,00



Building 117/1 equipment D&D Project. Engineering. Project development by the Contractor.

Following the contractual obligations, the Contractor defined the best D&D option, by analyzing with the MADA method the possible methods and equipment for dismantling, decontamination, waste management, radiological measurements on the qualitative and quantitative levels. In January, 2008 Contractor submitted D&D Strategy Report.

On the basis of the chosen strategy the Contractor has developed documents of Project BD, SJR, EIAR, DfC, which in February, 2010 were provided to the Regulator (Section 1 completion).

After reviewing the VATESI documents with the involvement of independent TSO experts and with the Contractor's support in October, 2010 the INPP license was added and permission for dismantling has been received (Section 2 completion).



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Building 117/1 equipment D&D Project. Engineering. Project development by the Contractor.



Site visit with contractor

Building 117/1 equipment D&D Project. Implementation. Procurements.

In the scope, defined by the Project, procurements were made necessary for equipment D&D, instruments and consumable materials:

- Electric portal and monorail cranes 3.2 t.
- Vacuum blasting units (2 piece)
- Mobile filtration units (2 pcs)
- Flame cutting units (4 pcs)
- Rreciprocating saw (1 piece)
- Trailer for HH ISO containers (1 piece)
- Toolware
- Spare parts and consumables.

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Building 117/1 equipment D&D Project. Implementation. Procurements.



Portal crane



Building 117/1 equipment D&D Project. Implementation. Procurements.



Mobile filtration unit

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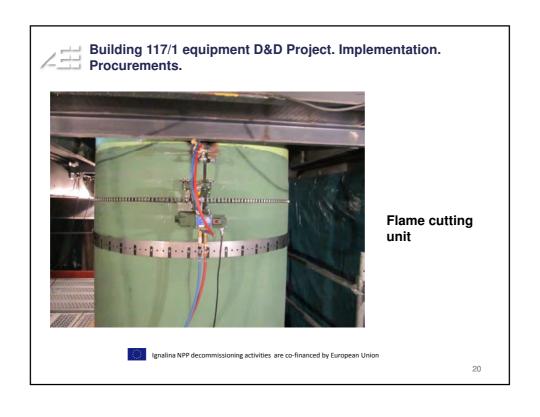
Building 117/1 equipment D&D Project. Implementation. Procurements.



Vacuum blasting unit (for decontamination)

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Building 117/1 equipment D&D Project. Implementation. Preparatory works.

Knowledge transfer.

- 1. Before the start of works on D&D by the Contractor (VTNS and LEI) the training has bee organized and INPP personnel attestation has been conducted (with the certificates issue) on the topics:
- Decommissioning program
- Radiation protection program
- PT ECCS dismantling
- Pipe cutting
- Wastes monitoring/packing
- Handling
- Wastes size reduction and decontamination



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Building 117/1 equipment D&D Project. Implementation. Preparatory works.

Knowledge transfer.

- 2. The suppliers and manufacturers of the procuring equipment organized the INPP training of safe work methods with issuing the certificates:
- Portable gas analyzers PGD-2 (UAB "Atomeksim")
- Vacuum blasting unit BNR3S (UAB SM, "Abraclean Ltd")
- Reciprocating saw JAESPA AS6 (UAB "Rolandas Moiseeis")
- Mobile filtration unit ("CAVERION GMBH")
- -Flame cutting unit Auto Picle-S (UAB KOIKE/MARIDANA)



Building 117/1 equipment D&D Project. Implementation. Preparatory works.

Preparatory works

In the course of the works on preparatory for dismantling the following has been performed:

- Partial dismantling with the aim of the area clearance for equipment D&D installation
- Organizing the interim dismantling waste storage facility before their treatment and transportation
- Construction works (transportation routes laying, cranes and ventilation installation)
- Installation and commissioning of procured equipment D&D
- Development of the additional Design documentation by the INPP personnel (if necessary)



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Building 117/1 equipment D&D Project. Implementation. Preparatory works.



Transportation door



Interim dismantling waste storage

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Place for installation of the crane



Building 117/1 equipment D&D Project. Implementation. Preparatory works.



Preparation of the decontamination section

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Building 117/1 equipment D&D Project. Implementation. Preparatory works.



Preparation of the decontamination section



Building 117/1 equipment D&D Project. Implementation. Preparatory works.



Ventilation installation



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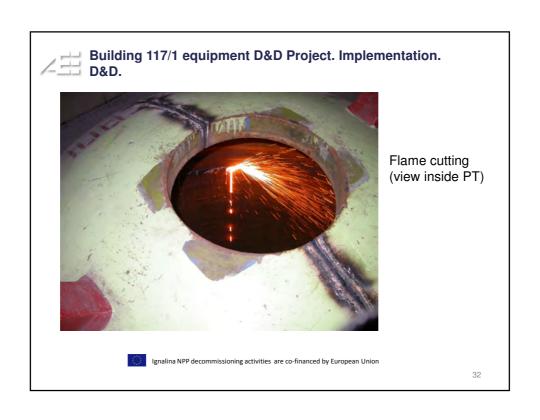


Building 117/1 equipment D&D Project. Implementation. D&D.

In the course of the Project implementation about 950 t of equipment, constructions and concrete were dismantled. From them:

- a) 0 class waste, went through Free release measurement unit (facility B10) 888.6 t This includes the waste after decontamination, as well as those waste, decontamination of which was not necessary. Composition:
- Steel 876 t
- Stainless steel 0.5 t
- Concrete 12.2 t
- b) A class waste (WLLW), primary and secondary waste $-\,55\,t.$ Composition:
- Slag after flame cutting 15.2 t
- Swart 15 t
- Shot after using in decontamination 3 t
- Remote contamination 13 t
- Primary A classes wastes 8.3 t
- c) The part of the metal has remained in the building for using it in other Projects.





















Packing of the wastes

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Dismantling of the metal overlaps

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Building 117/1 equipment D&D Project. Implementation. D&D.



Building after the end of dismantling

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── Building 117/1 equipment D&D Project. Implementation. Impact on the Environment and radiation protection.

The hazardous emissions are regulated by the requirements of Permissions for integrated warning and control (TIPKL TV(2)-3), which was issued by the Department of Environmental Protection of Utena region. According to the EIAR estimation, the emissions amounted to 0,034 t CO and 0.024 t NOx.

Radioactive emissions amounted to 1.78E+4 Bk, which in 10 times smaller of the design-basis and in E+10 smaller of the permitted from the INPP site. The emissions did not made an influence on the environment.

The radiation doses to the personnel were far less than was foreseen by the Project.



Building 117/1 equipment D&D Project. Implementation.

Actual value of the Project.

Payments to the Contractor - € 1 937 870 Total expenditures for the equipment D&D procurement - € 842 907 Additional expenditures for the consumable materials - € 28898 Expenditures for the consumed energy resources – € 117 841 Total personnel salary - € 429 452

Actual INPP expenditures for the Project implementation made € 1 419 098.



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∠ Building 117/1 equipment D&D Project

THANK YOU FOR YOUR ATTENTION.

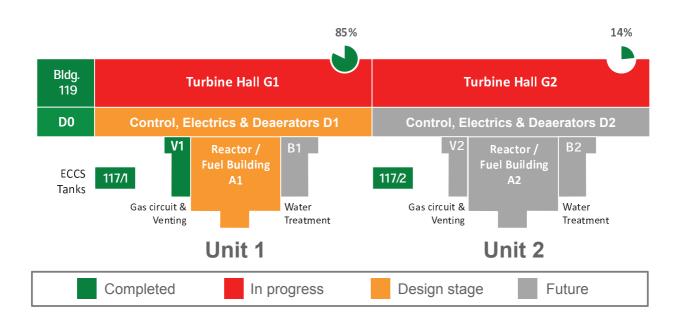






Progress of Dismantling





Main stages of the project



- 1. Development of Project B9-1 INPP Unit 1 Turbine Hall Equipment Dismantling and Decontamination, licensing
- 2. INPP unit turbine hall non contaminated equipment Dismantling
- 3. Procurement of tools for waste of dismantling size reduction and decontamination
- 4. INPP unit turbine hall contaminated equipment Dismantling

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Development of Project B9-1

Ignalina NPP



The contract to develop the project was made 2007-11-22 by international tender.

Project managers from the INPP - DS workers (currently DD group)

Development of Project B9-1



The contractor - consortium consisting of:

- 1. UKAEA Ltd (United Kingdom Atomic Energy Authority)
 - the consortium leader (United Kingdom)
- 2. Grontmij Ltd (United Kingdom)
- 3. Ernst & Young Baltic UAB (Lithuania)
- 4. SWECO BKG LSPI UAB (Sweden, Lithuania)

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Development of Project B9-1



The volume of project documentation

- 1. Environmental impact assessment report
- 2. D&D Basic Design
- 3. Safety justification report
- 4. Simplified design (preparatory works)
- 5. D&D detailed design (Проекты производства работ)
- 6. Technical specifications for Procurement of tools

Development of Project B9-1



The project implementation

- 1. Environmental impact assessment report has been prepared 2010-06-01
- 2. The solution of Agency of Protection of Environment of the Lithuanian Republic received 2011-06-09
- Documents to amendment the license to perform D&D activities (Basic Design, Safety justification report)
 were prepared 2010-06-01

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Development of Project B9-1



The project implementation

- 4. Amendment VATESI licenses for dismantling work received 2011-10-19
- 5. 2012-05-24 completed the development of all project documentation provided by the contract



Preparatory works include:

- 1. Provide transportation from unit G-1 in bld.119
- 2. Preparation of buffer zones waste storage:
- · FWP equipment dismantling
- AFWP equipment dismantling

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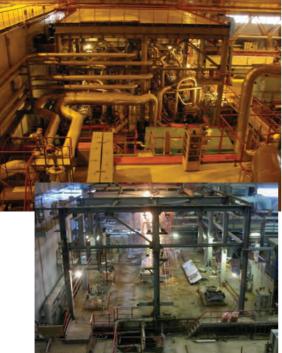
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Preparatory works



Driveway for waste transportation from unit G-1 in bld.119





Buffer zones VLL waste storage



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Dismantling of non contaminated equipment

Ignalina NPP

INPP unit turbine hall equipment Dismantling started 2011-10-21

- 1. Circulation water pipeline
- 2. The equipment of the oil system
- 3. The cooling system of the generator
- 4. Generator, exciters



Equipment of circulation water pipeline





Before After

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Dismantling of non contaminated equipment



The cooling system of the generator





Before After

Dismantling of non contaminated equipment



The equipment of the oil system (oil tank)



Before After

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Dismantling of non contaminated equipment



The generator, exciter (preparation of the generator stator for transport)



Before After

Procurement of tools



In beginning of 2013 the contract was concluded for Procurement of tools for waste of dismantling size reduction and decontamination, including:

- 1. The protective chamber for size reduction waste
- 2. The protective chamber for decontamination of waste
- 3. Grit Blasting installation
- Stationary ventilation system
 In December 2013 the equipment was put into operation

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Procurement of tools



The protective chamber for size reduction waste



During assembly

After

Procurement of tools





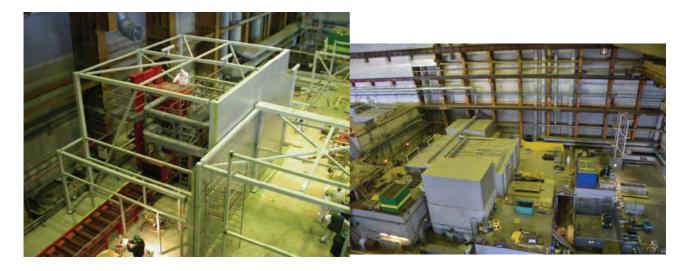
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Поставка оборудования



The protective chamber for decontamination of waste (Grit Blasting installation)



During assembly

After

Dismantling of contaminated equipment



Now dismantling works were made:

- 1. Turbine units
- 2. Turbine condensers
- 3. Equipment of turbine cell:
- evaporators
- low pressure heaters
- ejectors
- pipelines

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Dismantling of contaminated equipment



Now dismantling works is performed:

- 1. condensate purification filters
- 2. equipment of DGBF (УСГС)
- 3. equipment of drain боксов (ДБК)
- 4. electrical equipment
- 5. foundations of condensers

Dismantling of contaminated equipment



Dismantling of turbine



Before After

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Dismantling of contaminated equipment

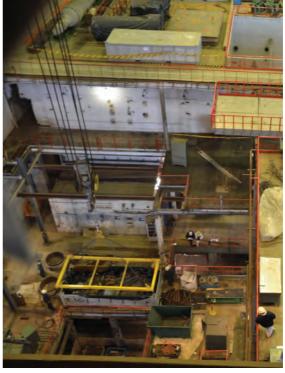




Dismantling of contaminated equipment







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Демонтаж оборудования





Демонтаж оборудования

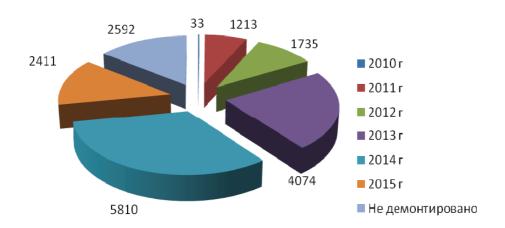




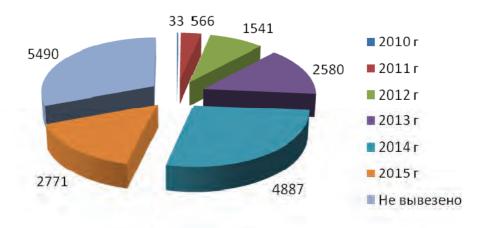
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Демонтаж оборудования Турбинного зала 1-го блока





At the end of June 2015 85% equipment is dismantled



69% of waste dismantling equipment completed the primary treatment

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