



Ignalina nuclear power plant

Presentation to IIDSF Assembly of Contributors

8 June 2011

INPP Presentation Outline

Dec. 2010 - June 2011

by **Osvaldas Ciuksys**
INPP Corporate Director

1. Key events in the period
2. Progress of INPP internal activities in 2011
 - Management optimisation
 - Progress in decommissioning (fuel unloading / dismantling)
 - Establishment of ICCC - Ignalina Carbon Competence Centre
3. Progress of major investment projects:
 - Interim Spent Fuel Storage Facility (B1)
 - Solid Waste Management & Storage Facility (B2/3/4)



Fukushima Daiichi accident (11 March)



Key event

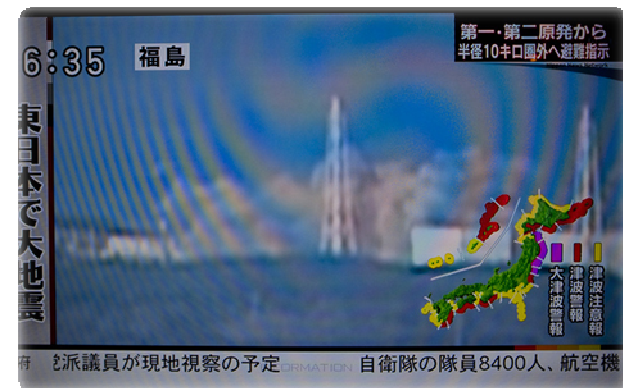


Post-Fukushima recommendations (1)

- World Association of Nuclear Operators: **2011-04-05**
- Western European Nuclear Regulators Association: **2011-04-21**
- Nuclear Safety Regulators' Group: **2011-05-13**
- Lithuania's State Nuclear Power Safety Inspectorate (VATESI): **2011-05-27**

INPP Action Plan (2011-03-30)

- Safety systems, procedures and staff availability and functionality
- Readiness to mitigate station blackout
- Readiness to mitigate flooding
- Readiness to mitigate fire



Key event



Post-Fukushima recommendations (2)

Stress tests

- Facilities included:
 - Unit 2 reactor core
 - Unit 1 and Unit 2 Spent Fuel Ponds
 - Existing Dry Spent Fuel Storage
 - New Spent Fuel Storage (B1)
- Reporting schedule
 - Pre-assessment
 - Progress report: **2011-08-15**
 - National Report: **2011-10-31**
 - Peer review: **2011 April**

The national regulator VATESI is expecting a comprehensive report to be delivered by INPP by October 2011 in accordance with the measures recommended by EU and relevant to stress-test requirements for NPPs operating in EU

Emergency Preparedness Training

- Took place 24 February 2011
- 267 INPP employees from management and various services participated
- New Emergency Plan reflecting new INPP configuration and organizational structure validated
- New scenario of drop of SFAs to the pond and their interaction was examined
- Beyond design emergency procedures were validated
- Observed by RSC, VATESI, etc.
- Lessons learned – vulnerabilities and further improvement



Progress of INPP internal activities in 2011

- Management optimisation
- Progress in decommissioning (fuel unloading / dismantling)
- Establishment of Carbon Competence Centre

Management optimisation (1)



Improved integration

- **Changes at the top management**
- **Reorganization of Decommissioning Projects Management service:**
 - integrated to the main administration (back home)
 - consultants (former PMU) integration into the administration
- **Relocation of Public Procurement and Technical Surveillance Services:**
 - closer and better monitored activities
 - more effective administration
- **Formation of B1 integrated project team:**
 - joint effort of the plant to build the qualified project implementation team (B234 project team will follow based on B1 experience)
- **Closer cooperation with contractors Nukem and GNS:**
 - more regular meeting on the issues to be addressed
 - offices allocated at the main administration buildings



Management optimisation (2)

Improved efficiency

- **Energy Savings Task Force created** (5 persons)
- **Further strengthening of the personnel**
 - Filling the gaps in qualifications by retraining or recruiting:
 - New head of personnel from private sector
 - Corporate relations expert
 - New project managers: decommissioning, construction
 - Commercial lawyer to strengthen Public Procurement Service and auctioning
- **KPI developed for personnel working with:**
 - Measurable output (e.g. tons of dismantled equipment)
 - Performing support activities covered by specific WBS work
 - Personnel performing administrative functions



Revenue generation

Sale of wastes

- “1 year +” agreement signed with Finnish company Kuusakoski on decontaminated black metal scrap sales after successful auction in April 2011
- Other group of decontaminated scrap (colour metals and electronics) to be auctioned under similar agreements
- Possible sale of used equipment to other energy/nuclear sector companies in 2011

All revenues generated from waste sales are used to support decommissioning activities

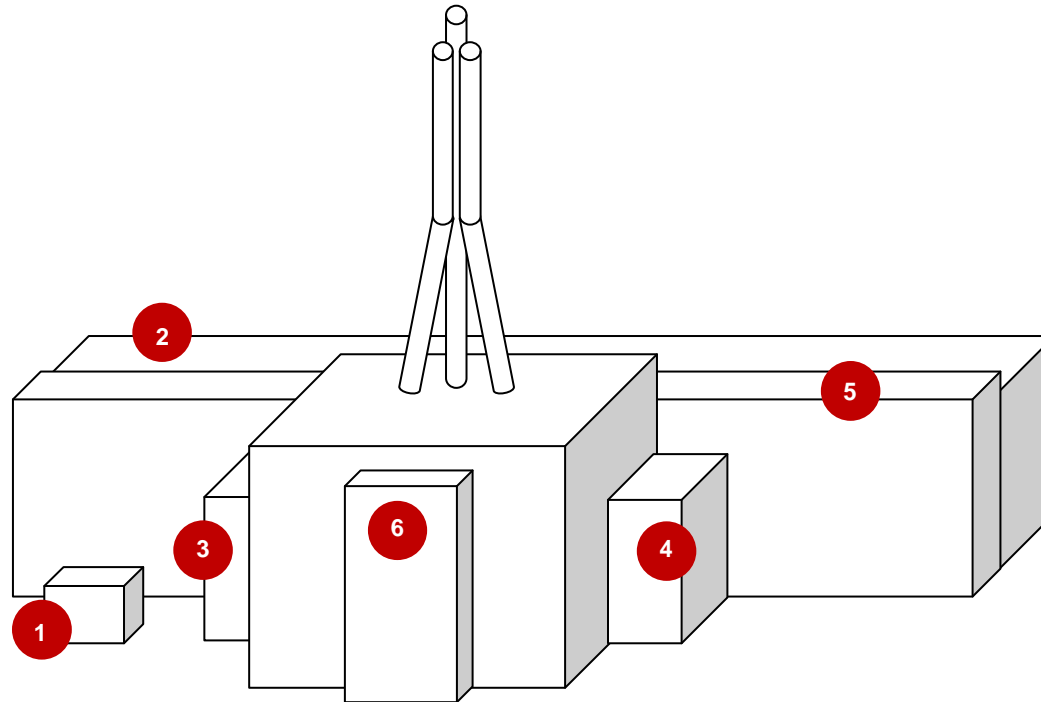
Fuel Unloading

Unloading of spent fuel from Unit 2 reactor

- Unloading programme worked out by INPP Nuclear Fuel Division
 - Programme approved by VATESI
 - Unloading 500 spent fuel assemblies and transfer to spent fuel ponds
 - On average 3 SFA unloaded daily
 - Started 1 February 2011
 - To be completed by February 2012
- ➔ Aim to increase safety**



Sequence of starting D&D



1. emergency core cooling system water storage tanks (Building 117)
2. turbine generators with auxiliary systems, feed facilities and heat supply facilities (Block G)
3. reactor gas circuit and special venting system (Block V)
4. low salt water and main coolant circuit bypass water treatment facilities (Block B)
5. control room, electrical equipment and deaerator (Block D) heat pipe service / fire fighting (Unit 1 only)
6. reactor building (Block A)



D&D Status Overview

Main Stages of Work Execution

	Bldg. 117/1 (B9-0)	Block G1 (B9-1)	Block V1 (B9-2)	Bldg. 119 (B9-5)
1. Preparation for design development	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2. Design development	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3. Agreement of VATESI/other institutions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Availability of D&D tools and equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Execution of preparatory works	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Implementation of D&D activities	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Completion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Building 117/1: ECCS

Dismantling of Unit 1 Emergency Core Cooling System tanks (B9-0)

Before



Now



Planned
completion:
Nov. 2011



Block G1: Unit 1 Turbine Hall

Preparatory works implementation within Block G1 (B9-1)

Before



Now



INPP Progress in 2011 – Decommissioning



Building 119: Boiler House

Preparatory works implementation within Boiler House (B9-5)

Before



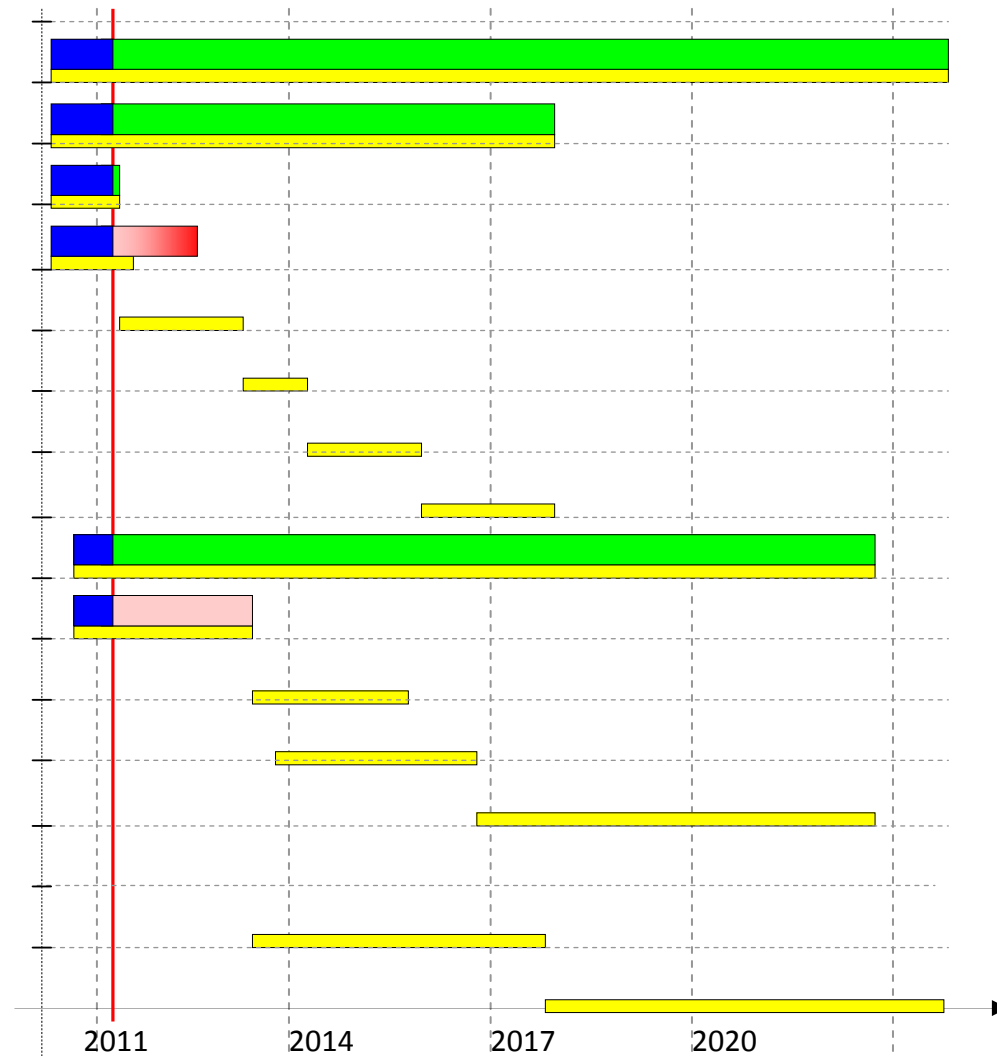
Now





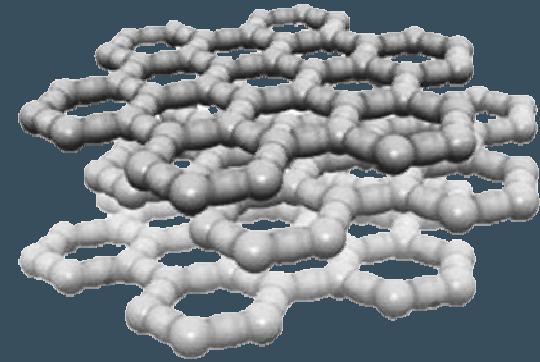
Reactor Dismantling (UP01) Status

- Total
- R1&R2 (Unit 1)**
- WP 1. Engineering studies
- WP 2. Radiological surveys
- WP 3. Development of the design documentation
- WP 4. Approval of the design documentation by state institutions
- WP 5. Preparatory works for dismantling
- D&D for R1 and R2. According to a separate schedule
- R3 (Unit 1)**
- WP 6. Engineering studies
- WP 7. Development of the design documentation
- WP 8. Approval of the design documentation by the state institutions
- D&D for R3. According to a separate schedule
- R1&R2&R3 (Unit 2)**
- WP 9. Recurrence/adaptation of WP1-8 for Unit 2
- D&D for R3. According to a separate schedule



Reporting Date: 2011-06-06

Ignalina Carbon Competence Center



Further step to project UP01 for D&D of both reactor shafts
is creation of Carbon Competence Centre allowing all
interested countries and companies to gain from RBMK
reactor decommissioning

INPP → ICC



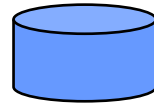
Shape of the challenge

Windscale AGR



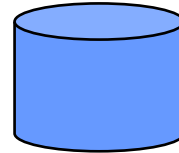
Height: 6m
Diameter: 6m
Weight: 285 tonnes

**Calderhall/Chapelcross
Magnox**



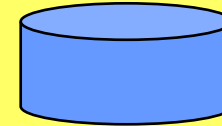
Height: 6.4m
Diameter: 9.45m
Weight: 1164 tonnes

Hartlepool AGR



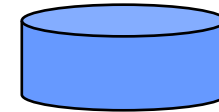
Height: 9.8m
Diameter: 11.2m
Weight: 1360 tonnes

Ignalina RBMK



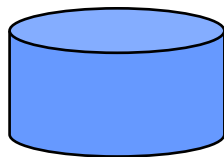
Height: 8m
Diameter: 14m
Weight: 1760 tonnes

**Hunterston A
Magnox**



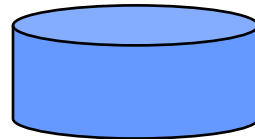
Height: 7m
Diameter: 13.5m
Weight: 1780 tonnes

Oldbury Magnox



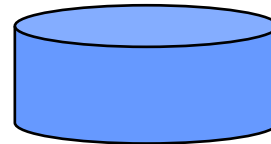
Height: 9.8m
Diameter: 14.2m
Weight: 2090 tonnes

Hinkley A Magnox



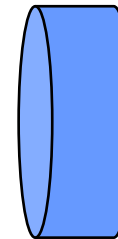
Height: 8.8m
Diameter: 16.2m
Weight: 2210 tonnes

Wylfa Magnox



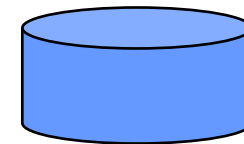
Height: 9.14m
Diameter: 17.4m
Weight: 3470 tonnes

Windscale Piles



Depth: 7.4m
Diameter: 15.3m
Weight: 2000 tonnes

Bugey - 1



Height: 9m
Diameter: 15.17m
Weight: 2060 tonnes



Strengthening competences

Organising a special conference of appropriate experts in November 2011

Main fields of action	Scientists and industries	Nuclear objects
Optimization of checking in real time (numebr of samples, samples, methods etc)	IAEA expert, DOE expert, JK expert Anthony Wickham EDF (France), Dr. Bernard Ponchet Physics Institute (Lithuania), Dr. Gr. Duškesas	Bugey-1 (France) Windscale AGR (UK) AVR (Germany) RBMK-1000 (Ukraine) Other sites with graphite
Checking and analysis in real time (taking of samples and relevant mesurement) using existing available information and	Physics Institute (Lithuania), Dr. V. Remeikis Lithuanian Energy Institute (Lithuania), Dr. P. Poškas Kurchatov Institute (Rusija), Dr. B.K. Bylkin, Dr. Krajushkin	RBMK-1500 (Lithuania) RBMK-1000 (Russia, Ukraine) Other sites with graphite
Integrated methods	Doosan Babcock part of Doosan Power Systems Ltd, M. Grave National Nuclear Laboratory (UK), A. Banford EDF (France), C. Glorennec NIKIET (Russia) VNIPIET (Russia)	Bugey-1 (France) Windscale AGR (UK) Magnox (UK), Beloyarsk NPP (Russia)
Special cases for condicioning, treatment and disposal	Forschungszentrum Jülich (Germany), Dr. W. von Lensa FNAG (France, Germany) Dr. J. Fachinger Bradtec Decon Technologies Ltd (UK, USA), D. Bradbury RADON, Dr. O. Karlina	Different solutions

MAJOR PROJECTS

Interim Spent Fuel Storage Facility (ISFSF)

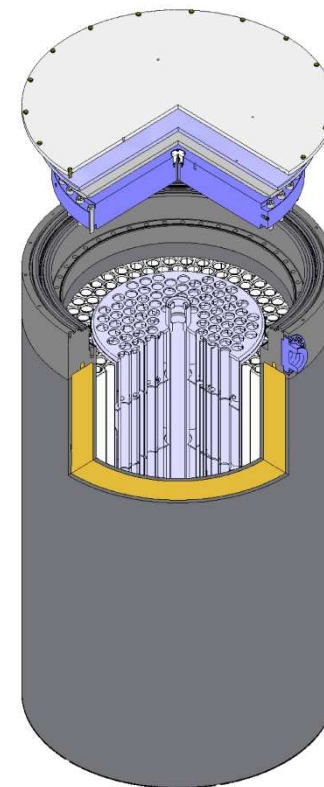
Project B1

B1: Overview

Design and construction of dry storage for ~16,000 spent fuel assemblies.

Main components of project:

- 190 casks new-type large fuel casks
- New storage facility adjacent to INPP site
- Modifications to INPP in-unit spent fuel areas for handling/loading of new casks
- Damaged Fuel Handling System





B1: Current Status

Civil works	85%,
Equipment	98 %,
Containers	106
Factory tests	22%

- Slow down of civil construction at the stage of completion by Nukem
- Cooperation with GNS (and some parts with Nukem) on technical solutions for issues to be addressed inside the Units 1 and 2 are progressing



B1: Progress of civil works



At 1 June 2011: Considerable effort still required for completion.

B1: Spent Fuel Interim Storage Facility



B1: Principal issues

1. New-type Constor casks
2. Cranes
3. Shock-absorbers
4. Cask transportation
5. Cask storage hall
6. Continuing delays



IMPORTANT SAFETY CONCERNS

Technical Meeting
24/25 May 2011

Senior Management Meeting
21 Jan. 2011 / 31 May 2011



INPP Conclusions on B1

- Regrettable that outstanding issues still exist
- INPP willing to work constructively for resolution
- Response from Contractor on safety issues shortly
(If issues are not resolved, will seek independent review)

But:

- INPP will **not** compromise on safety

MAJOR PROJECTS

Solid Waste Management & Storage Facility (SWMSF)

B2: Waste retrieval and sorting

B3: Waste management

B4: Waste storage, 2 parts:

- Short-lived waste
- Long-lived waste



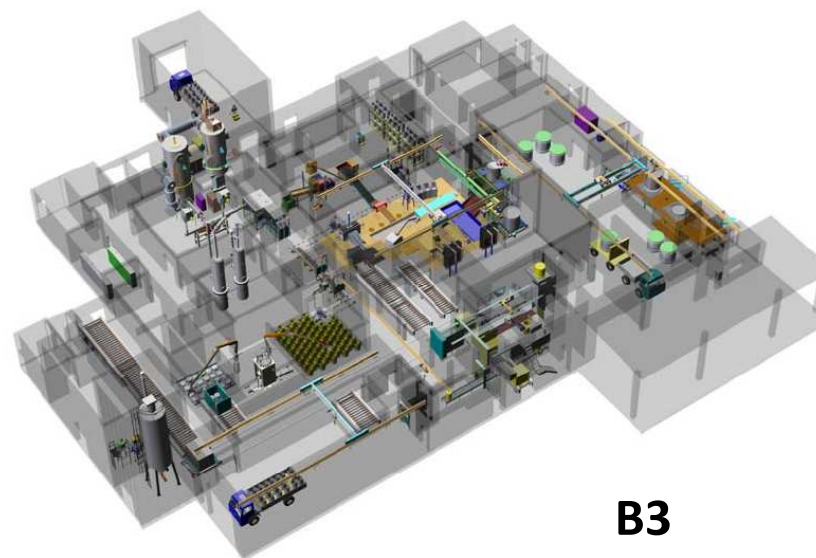
B234 Overview

B2: Waste retrieval & sorting

- 4 years in delay
- No on-site activities yet at INPP
- Not on critical path of decommissioning

B34: Waste management & storage

- 3 years in delay
- Construction progressing





B2 Progress & forecast

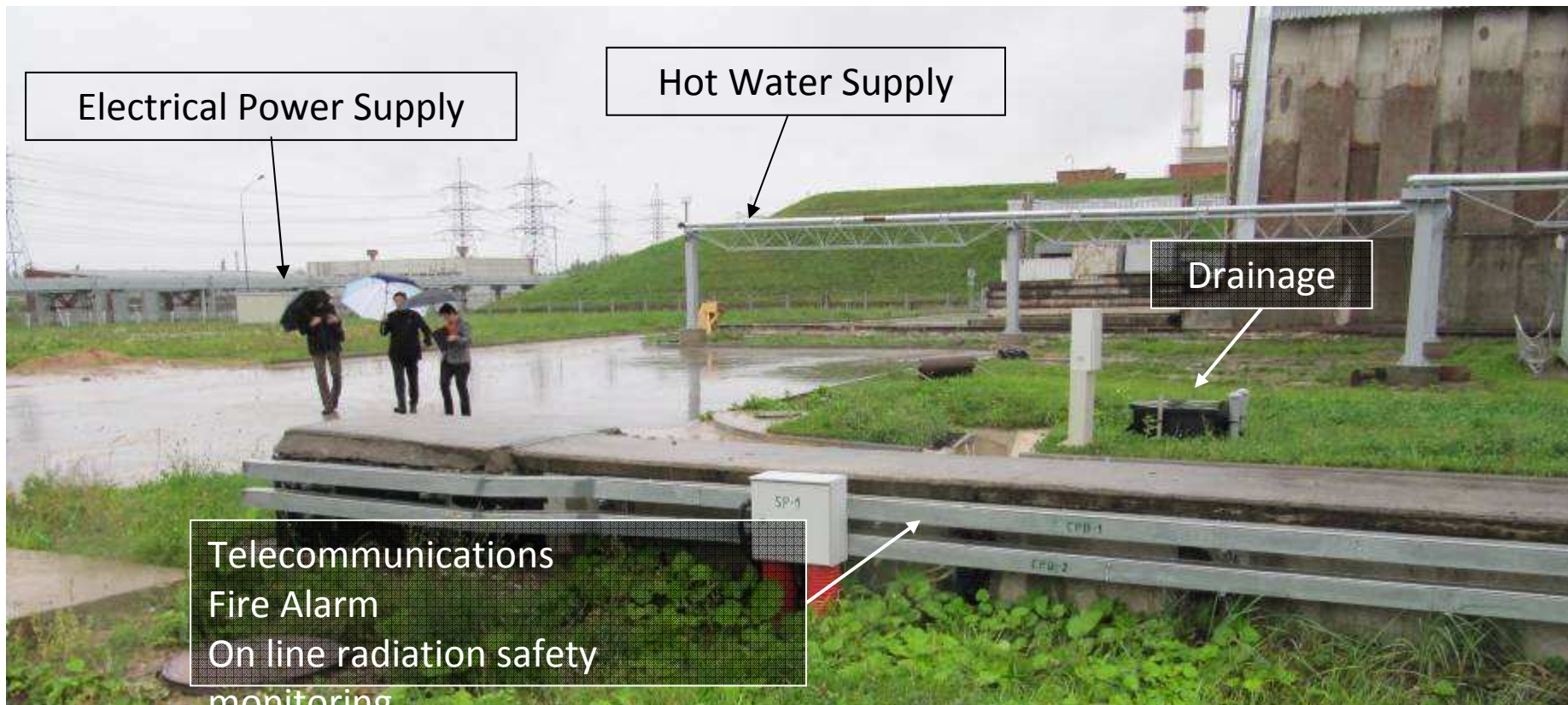
Activities

- Construction License received: 27 Apr. 2011
 - Permission for Construction received: 9 May 2011
 - Piling work planned start: 7 June 2011
- } Retrieval Unit 1 (RU1) **only**

Contractor's forecast for completion

- RU1
 - RU2
 - RU3
- } Operational Acceptance January 2014

B2 Site infrastructure



All employer-side B2 site infrastructure already in place

B234: Solid Waste Management & Storage Facility



B34 Progress (1)

Construction

- B3 walls (14.4 to 20.0m)**
 - works began 4 April 2011
 - current completion approx. 85%
- B4 SLW walls**
 - current completion approx. 80%
- B4-LLW walls**
 - 100% completed on 20 April 2011
- B4-LLW roof**
 - works began on 17 May 2011,
 - 40% of roof beams delivered to site
 - 19% of roof beams installed

Forecast for completion

- Completion of Construction Works July 2011
- Operational Acceptance February 2013



B34 Progress (2)

B34 complex (south view)

4 Nov. 2010



2 June 2011



B234: Solid Waste Management & Storage Facility

B34 Progress (3)

B4 Short-lived waste facility

4 Nov. 2010

2 June 2011



South-east view



South-west view

B234: Solid Waste Management & Storage Facility



Commercial Issues

Original contract price (design & construction)

• Solid Waste Retrieval Facility (B2)	€ 32 806 105	
• Solid Waste Management & Storage Facilities (B3/4)		€ 87 259 676
	TOTAL	€ 120 065 781

Current contract price

• Payment of against Adjudicator decision + 9 changes in Contract Scope agreed with INPP (with corresponding Contract Amendment)	€ 3 967 514	
	TOTAL	€ 124 033 295

Seeking to resolve remaining commercial issues with Global Settlement



B234 Settlement Negotiations (1)

- **Several meetings on B234 with active participation of:**
 - IIDSF Donor Assembly Chairman
 - European Commission
 - NUKEM
 - EBRD
 - Ministry of Energy
 - INPP
- **Meetings on:**
 - 21 January 2011
 - 8 March 2011
 - 11 April 2011
 - 6 May 2011 (IIDSF Joint Steering Committee)



Conference



Ignalina NPP Decommissioning: Commitment to Achievement

Vilnius and Visaginas
30 June – 1 July 2011

Last call for attendance confirmation is 10 June 2011

Invitation to visit INPP and Visaginas extended to:

- **IIDSF Assembly of Contributors**
- **NDAP members**
- **European Commission and EBRD representatives**
- **Kozloduy NPP, Bohunice NPP representatives**

Thank you