1. Basic information

1.1 Désirée Number: CZ 01.14.01

1.2 Title: Re-assessment of the RPV internals stress state based on real service irradiated mechanical properties

1.3 Sector: IN & EN

1.4 Location: Czech Republic

2. Objectives:

2.1 Overall objective:

The material properties of reactor internal components change during irradiation, the changes being strongly affected by irradiation temperature and neutron flux. It is proposed to determine changes in mechanical and fracture mechanical properties of components irradiated during operation of the Greifswald VVER reactors to determine the parameters necessary for assessment of the residual lifetime of VVER internal structures (within the reactor core). There is little data available in this field; notably, there has been some work done in Finland on the Loviisa reactors.

2.2 Project purpose:

The purpose of the project would, first, be to establish a methodology for the experimental part of the work as well as to determine integration of the resulting database of properties into Czech regulatory procedures. Results gained through this project would help improve the quality of data supplied for the evaluation of safety assessment reports and inspection procedures in the context of the exercise of the licensing functions of the regulatory authority.

2.3 Accession Partnership and NPAA priority:

In the AP agreed with the Czech Republic continuation has been signalled of provision of high level of nuclear safety at Dukovany and Temelin NPPs and the further strengthening of state regulatory structures for nuclear safety and radiation protection (SUJB).

The Council Report on Nuclear Safety in the Context of Enlargement of June 2001 concluded in general and country specific recommendations, that, with regard to full safety analysis reports and related safety improvement measures, there should become available complete, plant-specific, in-depth safety analysis reports to Western standards, including regulatory reviews and approval.

3. Description of the Project:

The principal aim of this project would be to take advantage of a unique opportunity to study the changes in mechanical properties of actual internal VVER reactor components that would become available due to dismantling of Unit 1 at Greifswald, Germany. The project would result in a materials database.

The project is to proceed in two phases. In the first phase, the requisite mechanical samples shall be procured from the Greifswald NPP and brought to the Czech Republic for storage prior to use. In a second phase, the following activities are foreseen:
• Determining tensile and fracture mechanics properties of material irradiated during operation (including base metal, weld metal, heat-affected zone and material of bolts).
• Determining other parameters necessary for re-assessment of internal structure according to particular methodology (crack growth rates; threshold stress intensity factor, fracture toughness of irradiated materials).
• Comparing high lead experimental reactor irradiated material properties with properties of the material irradiated in actual operational conditions (Greifswald NPP) and establish a correction factor.

The Czech regulatory authority shall also address the implementation of the resulting data base in the exercise of its functions with regard to the Dukovany NPP.

4. Institutional framework:

The project would support the work of the Czech regulatory authority – the State Office for Nuclear safety - through augmentation of the technical capabilities of national TSOs.

5. Detailed budget (in M€)

<table>
<thead>
<tr>
<th>Project Components</th>
<th>Investment Support</th>
<th>Institution Building</th>
<th>Total Phare (= I + IB)</th>
<th>National Co-financing</th>
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6. Implementation arrangements

The decentralised implementation scheme (DIS) with ex-ante Commission control will be followed for the project. The CFCU will be the Implementing Agency responsible for tendering, contracting, and accounting.

6.1 Implementation Agency: Mr. Jan Slavíček,
Letenská 15
CZ - 118 10 PRAHA 1
Bus: +420-2-57044551
Bus Fax: +420-2-57044550
E-mail: jan.slavicek@mfcr.cz

6.1.1 Beneficiary: The State Office for Nuclear Safety

6.1.2 Contact: Mr. Milos Tichy
Bus: +420-2-21624740,
E-mail: milos.tichy@sujb.cz

6.2 Twinning: not applicable

6.3 Non-standard aspects: Due to the specific character of the project, a significant part of the work under this project will have to be contracted to Technical Safety Organisations. Non standard aspects, in line with the “new rules for contracts in the field of nuclear safety” COM(2000)493 final, might arise.

6.4 Contract: Two PHARE contracts
7. Implementation schedule

7.1 Start of tendering/call for tender: 1 Q. 2002
7.2 Start of project activity: 2 Q. 2002
7.3 Project completion: 4 Q. 2003

8. Conditionality and sequencing

The mechanical specimens crucial to the investigation must be acquired. This might well be determined by unforeseeable and uncontrollable factors affecting the progress of work at Unit 1 at Greifswald, Germany.

Approval for Phase I does not automatically imply approval for Phase II; a detailed proposal for the latter would, in any event, have to be considered separately based upon progress with Phase I.

The Terms of Reference (TOR) will be prepared by SUJB, with final approval together with the Commission.

The project will be sequenced as follows:


3 Q. 2003: submission of the draft final report with the final report to be submitted in the last quarter of 2003.
1. Basic information

1.1 Désirée Number: CZ01.14.02

1.2 Title: Assessment and validation of computer codes based on PSB-VVER experimental data

1.3 Sector: IN & EN

1.4 Location: Czech Republic

2. Objectives:

2.1 Overall objective:

International organisations have emphasised an urgent need for improvement in the confidence of certain thermo-hydraulic codes for VVER-1000 reactors. The parameters of a VVER-1000 test facility permit experimental simulation of a wide range of critical thermal-hydraulic processes that can occur in the primary and secondary circuits of VVER-1000 reactors during transient and accident situations.

2.2 Project purpose:

Results gained through this project would improve the confidence limits (define better the range of applicability of the various codes) when predicting the response of VVER-1000 reactors under transient and accident conditions.

2.3 Accession Partnership and NPAA priority:

In the AP agreed with the Czech Republic continuation has been signaled of provision of high level of nuclear safety at Dukovany and Temelin NPPs and the further strengthening of state regulatory structures for nuclear safety and radiation protection (SUJB).

The Council Report on Nuclear Safety in the Context of Enlargement of June 2001 concluded in general and country specific recommendations, that, with regard to full safety analysis reports and related safety improvement measures, there should become available complete, plant-specific, in-depth safety analysis reports to Western standards, including regulatory reviews and approval.

3. Description of the Project:

The project, ultimately, would comprise two separate, but related Phases. First there would be an evaluation of the different codes available to define a series of experiments to be carried out in the PSB-VVER-1000 test facility situated at Elektrogorsk Research Centre, Moscow. This preliminary evaluation would take account of the modalities of ultimately transferring results to the Czech regulatory authority for application to operating NPP. In this evaluation process priority should be given to application of EU thermo-hydraulic codes. The internationally accepted CSNI validation matrices for PWRs and VVERs will be used to define the scope of these experiments.

This project may be continued through a second Phase for which the Czech Republic might seek funds from a subsequent PHARE national programme, which would comprise carrying
out the experiments and post-experimental numerical modelling, as well as transfer of results to the Czech regulatory authority.

4. Institutional framework:

The project would support the work of the Czech regulatory authority – the State Office for Nuclear Safety.

5. Detailed budget (in M€)

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6. Implementation arrangements

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6.1 Implementation Agency:  CFCU  
Mr. Jan Slavícek,  
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Bus Fax: +420-2-57044550  
E-mail: jan.slavicek@mfcr.cz

6.1.1 Beneficiary: The State Office for Nuclear Safety

6.1.2 Contact:  Mr. Milos Tichy  
Bus: +420-2-21624740,  
E-mail: milos.tichy@sujb.cz

6.2 Twinning: not applicable

6.3 Non-standard aspects: Due to the specific character of the project, a significant part of the work under this project will have to be contracted to Technical Safety Organisations. Non-standard aspects, in line with the "new rules for contracts in the field of nuclear safety" COM(2000)493 final, might arise.

6.4 Contract: One PHARE contract

7. Implementation schedule

1 Q. 2002 start of tendering procedures  
2 Q. 2002 start of project activity  
1 Q. 2003 project completion
8. Conditionality and sequencing

Approval for Phase I does not automatically imply approval for Phase II; a detailed proposal for the latter would, in any event, have to be considered separately based upon progress with Phase I. Due regard is to be given to available results from other PHARE and TACIS funded projects in this area, as well as to other projects that will be conducted at the PSB facility.

The Terms of Reference (TOR) will be prepared by SUJB with final approval together with the Commission.

The project will be sequenced as follows:

1Q. 2002 start of implementation procedures, choice of contract letting procedure, completion of the TOR.
4. Q. 2002 Workshop for a critical discussion of the proposed experimental programme for ultimate application in Phase II (experiments to be done at PSB only in Phase II)
1 Q. 2003 submission of the draft final report.
SPECIAL NUCLEAR SAFETY PROJECT FICHE

1. Basic information

1.1 Désirée Number: CZ 01.14.03

1.2 Title: Solution for closure of a chamber in the Richard repository

1.3 Sector: IN & EN

1.4 Location: Czech Republic

2. Objectives:

2.1 Overall objective:

The Richard repository for short-lived radioactive waste (institutional waste) consists of a main access tunnel, excavated almost horizontally into a hillside for several hundred metres. It is owned and operated by the State organisation RAWRA (Radioactive Waste Repository Authority) A number of chambers leading off the main access tunnel are used for the storage of conditioned waste in 200 litre drums. It is the intention of RAWRA to backfill the void space between drums with a suitable grout prior to closure of the repository. In this way, closure of the chambers could start while complying with international safety recommendations for disposal of radioactive waste. However, there is not yet any agreement concerning both the nature of the back-filling material to be used, and the implementation works. Therefore investigations in this particular domain prove to be necessary.

2.2 Project purpose:

The main aim of the project is to develop a technical solution for closing disposal chambers of the Richard repository, and to assess the merits of this solution on one or more chambers. Based on the outcome of these investigations, a plan for the closure of all chambers should be then established. This plan should open up to the complete closure of all chambers of the repository, in the framework of additional projects. This means that this project only constitutes a first step in the closure operations of the Richard repository.

2.3 Accession Partnership and NPAA priority:

This project will create conditions for accomplishment of the medium-term priorities of the NPAA in sectorial policies and in the Accession Partnership. It is part of a comprehensive nuclear safety policy being implemented at the national level. The Council Report on Nuclear Safety in the Context of Enlargement of June 2001 issued recommendations concerning the safety of other types of nuclear installations than nuclear reactors. It is notably stated that "all candidate states should continue to develop and implement their national programmes regarding the safe management of spent fuel and radioactive waste" (recommendations of type II). In this context the closure of the Richard repository would constitute an important safety improvement. It is worth noting that this project complies with the new concept for radioactive waste management that should be adopted by the Czech government by the end of 2001.

3. Description of the Project:

The work programme of the project should comprise the following items:

• Review of the existing data;
• Determination of safety objectives;
• Development of specifications for the technical solution of closure;
• Development of specifications for a long-term monitoring programme;
• Preparation of a detailed work programme including procurement implementation and licensing activities;
• Safety assessment of the proposed technical solution;
• Review of the plan by stakeholders (waste producers, RAWRA, SUJB etc.).

The implementation of the technical solution will follow up as a separate project for which the Czech Republic might seek funding under a further PHARE nuclear safety national programme.

4. Institutional framework:

The project will support the work of the state organisation "Radioactive Waste Repository Authority (RAWRA)".

5. Detailed budget (in M €)

<table>
<thead>
<tr>
<th>Project Components</th>
<th>Investment Support (IS)</th>
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6. Implementation arrangements

The decentralised implementation scheme (DIS) with ex-ante Commission control will be followed for the project. The CFCU will be the Implementing Agency responsible for tendering, contracting, and accounting:

6.1 Implementing Agency: Mr. Jan Slavíček,
Letenská 15
CZ - 118 10 PRAHA 1
Bus: +420-2-57044551
Bus Fax: +420-2-57044550
E-mail: jan.slavicek@mfcr.cz

6.1.1 Beneficiary details: RAWRA, Dlazděna 6, 110 00 Prague 1,
Director: Mr. Vitezslav Duda, MBA
Telephone: + 420 2 214 215 26
Technical co-ordination: Mr. Miroslav Kucerka
Telephone: + 420 2 214 215 28
Fax: + 420 2 214 215 44
E-mail: kucerka@rawra.cz

6.2 Twinning: not applicable

6.3 Non-standard aspects: not applicable

6.4 Contract: One PHARE contract
7. Implementation schedule

7.1 Start of tendering/call for tender: 2 Q. 2002

7.2 Start of project activity: 3 Q. 2002

7.3 Project (the technical solution) completion: 3 Q. 2003

8. Conditionality and sequencing

As far as applicable, measures taken should be in line with obligations under the Waste Framework Directorate (Directive 75/442/EEC as amended by Directive 91/156/EEC) as well as with the Directives on water quality, in particular, the Groundwater Directive 80/68/EEC, as well as the EIA Directive (Directive 85/337/EEC, 97/11/EC).

The project will be sequenced as follows:

1 Q. 2002: start of implementation procedures, choice of contract letting procedure, completion of a detailed Technical Project Description Sheet, also the ToR.


2 Q. 2003 Development of the technical solution

3 Q. 2003 Review by stakeholders
SPECIAL NUCLEAR SAFETY PROJECT FICHE

1. Basic information

1.1 Désirée Number: CZ 01.14.04

1.2 Title: Reconstruction of the hot cell at the Richard repository facility

1.3 Sector: IN & EN

1.4 Location: Czech Republic

2. Objectives:

2.1 Overall objective:

At present there are some disused sealed radioactive sources in the Czech Republic for which no long term storage or disposal route exists. These are mainly long-lived sealed radioactive sources. At present these sources are provisionally stored at users’ premises. The State organisation RAWRA (Radioactive Waste Repository Authority) as owner and operator recognises that it has a responsibility to provide a disposal route for such wastes and is examining the possibility of receiving such sources into Richard for interim storage prior to disposal in a deep underground repository. According to Czech regulations, interim storage in the chambers of the Richard repository would require packaging or re-packaging of these sources, and control of their physical integrity. In order to do so, a suitable hot-cell must be operational near the Richard repository.

2.2 Project purpose:

The main purpose of this project is to reconstruct a hot cell situated in a building just outside the Richard repository so that packaging, repackaging and physical control of the integrity of disused long-lived sealed radioactive sources - removed from users' premises - can be performed according to current Czech safety regulations. This operation is a prerequisite for a subsequent long-term storage of these sources into chambers of the Richard repository pending the availability of a deep underground disposal facility.

2.3 Accession Partnership and NPAA priority:

This project will create conditions for accomplishment of the medium-term priorities of the NPAA in sectorial policies and in the Accession Partnership. It is part of a comprehensive nuclear safety policy being implemented at the national level. The Council Report on Nuclear Safety in the Context of Enlargement of June 2001 issued recommendations concerning the safety of other types of nuclear installations than nuclear reactors. It is notably stated that "all candidate states should continue to develop and implement their national programmes regarding the safe management of spent fuel and radioactive waste" (recommendations of type II). In this context the long-term storage of disused long-lived sealed radioactive sources in the Richard repository would constitute an important safety improvement against their current storage at users’ premises. It is worth noting that this project complies with the new concept for radioactive waste management that should be adopted by the Czech government by the end of 2001.

3. Description of the Project:

The work programme of the project should comprise the following items:
• Review of the existing data;
• Determination of safety objectives;
• Development of technical specifications for the reconstruction of the hot cell;
• Preparation of a detailed work programme including procurement implementation and licensing activities;
• Safety assessment of the proposed reconstruction plan;
• Review of the plan by stakeholders (waste producers, RAWRA, SUJB etc.);
• Selection of contractors for the reconstruction works;
• Reconstruction works;
• Training of personnel.

4. Institutional framework:

The project would support the work of the state organisation "Radioactive Waste Repository Authority (RAWRA)".

5. Detailed budget (in M €)

<table>
<thead>
<tr>
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</table>

6. Implementation arrangements

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6.1 Implementing Agency: CFCU
Mr. Jan Slavícek,
Letenská 15
CZ - 118 10 PRAHA 1
Bus: +420-2-57044551
Bus Fax: +420-2-57044550
E-mail: jan.slavicek@mfcr.cz

6.1.1 Beneficiary details: RAWRA, Dlazdena 6, 110 00 Prague 1,
Director: Mr. Vitezslav Duda, MBA
Telephone: + 420 2 214 215 26
Technical co-ordination: Mr. Miroslav Kucerka
Telephone: + 420 2 214 215 28
Fax: + 420 2 214 215 44
E-mail: kucerka@rawra.cz

6.2 Twinning: not applicable

6.3 Non-standard aspects: not applicable

6.4 Contract: One PHARE contract
7. Implementation schedule

7.1 Start of tendering/call for tender: 2 Q. 2002
7.2 Start of project activity: 3 Q. 2002
7.3 Project completion: 3 Q. 2003

8. Conditionality and sequencing

The co-funding of the project by the Czech authorities (RAWRA) must be secured. A decision should be taken in autumn 2001.

As far as applicable, measures taken should be in line with obligations under the Waste Framework Directorate (Directive 75/442/EEC as amended by Directive 91/156/EEC) as well as with the Directives on water quality, in particular, the Groundwater Directive 80/68/EEC, as well as the EIA Directive (Directive 85/337/EEC, 97/11/EC).

The project will be sequenced as follows:

1Q. 2002: start of implementation procedures, choice of contract letting procedure, completion of a detailed Technical Project Description Sheet, also the ToR.
1 Q. 2003 Approval of the reconstruction plan of the hot cell by the stakeholders
3 Q. 2003 End of reconstruction works
Hot cell testing and beginning of packaging operations
Training courses for the personnel.
1. Basic information

1.1 Désirée Number: CZ 01.14.05

1.2 Title: Development of a waste tracking system

1.3 Sector: IN & EN

1.4 Location: Czech Republic

2. Objectives:

2.1 Overall objective:

The Czech Republic has ratified the "Joint Convention on the Safety of Spent Fuel Management and on the safety of Radioactive Waste Management". According to the terms of this Convention, the relevant Czech authority (in this case the Radioactive Waste Repository Authority RAWRA) should establish a reliable inventory of different kinds of radioactive waste currently stored and/or disposed of on the territory of the Republic. For that purpose, and also to comply with the terms of the Czech "Atomic Act" (N° 18/1997), RAWRA launched a project in early 2000 on the development and implementation of a basic information system. This system enables the recording of waste producers as well as the location of all individual waste packages that are currently under the control of RAWRA. At present the system is still in a trial phase. In order to extend its scope to all kinds of radioactive waste stored in the Czech Republic that are not under the control of RAWRA, further optimisation of the computerised system is required. In this way, it will be possible to track all radioactive wastes generated in the Czech Republic and thereby increase the overall safety of radioactive waste management.

2.2 Project purpose:

The main purpose of this project is to generate an extended computerised system that would enable the tracking of all kinds of radioactive waste currently existing on the territory of the Czech Republic. This will improve the safety of radioactive waste management and help the waste producers whenever they are reporting to the Czech safety authorities. The system should be compatible with international recommendations. The records thus produced should comply with the format required by the Joint Convention.

2.3 Accession Partnership and NPAA priority:

This project will create conditions for accomplishment of the medium-term priorities of the NPAA in sectorial policies and in the Accession Partnership. It is part of a comprehensive nuclear safety policy being implemented at the national level. The Council Report on Nuclear Safety in the Context of Enlargement of June 2001 issued recommendations concerning the safety of other types of nuclear installations than nuclear reactors. It is notably stated that "all candidate states should continue to develop and implement their national programmes regarding the safe management of spent fuel and radioactive waste" (recommendations of type II). In this context the development of the waste tracking information system would constitute an important safety improvement.
3. Description of the Project:

The work programme of the project should comprise the following items:

- Review of the existing database system;
- Analysis of the flow of information between RAWRA and waste producers;
- Review of the system for waste package description;
- Identification of the weakest points of the current system;
- Development of new system modules;
- Testing of the improved computerised system (on and off-line);
- Review by the Czech stakeholders (waste producers, RAWRA, SUJB etc.);
- On-line trial operation, training of users.

4. Institutional framework:

The project would support the work of the state organisation "Radioactive Waste Repository Authority (RAWRA)".

5. Detailed budget (in M €)

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Technical co-ordination: Mr. Miroslav Kucerka
Telephone: + 420 2 214 215 28
Fax: + 420 2 214 215 44
E-mail: kucerka@rawra.cz

6.2 Twinning: not applicable

6.3 Non-standard aspects: not applicable

6.4 Contract: One PHARE contract
7. Implementation schedule

7.1 Start of tendering/call for tender: 2 Q 2002
7.2 Start of project activity: 3 Q. 2002
7.3 Project completion: 3 Q. 2003

8. Conditionality and sequencing

No conditionality.

The project will be sequenced as follows:

1. Q 2002: start of implementation procedures, choice of contract letting procedure, completion of a detailed Technical Project Description Sheet, also the ToR.
3. Q. 2003 Development of the information system
Review of the system by the Czech stakeholders
System testing and beginning of a trial operation