

# Technical Basis for Russian and West European NDT Qualification TACIS/R/TSO/05 Project

## Project General Data

➤ <b>Beneficiary:</b>	<b>Gosatomnatzor</b>
➤ <b>Contractors:</b>	<b><u>GRS</u>-AEA T- VTT (IZFP subcontractor)</b>
➤ <b>Local Subcontractor:</b>	<b>SEC NRS</b>
➤ <b>Sector of activities:</b>	<b>Regulatory Assistance</b>
➤ <b>Sites:</b>	<b>All sites with VVER and RBMK NPPs</b>
➤ <b>Installations:</b>	<b>VVER, RBMK</b>
➤ <b>Status:</b>	<b>Completed</b>
➤ <b>Budget:</b>	<b>700 000 €</b>
➤ <b>Duration:</b>	<b>22 months, starting on March 18, 1996</b>
➤ <b>Reporting:</b>	<b>Project well documented</b>



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## Objectives of the Project (1)

- ☞ To provide assistance to Eastern European Safety Authorities in the assessment of reactor safety improvements and on-site programmes
- ☞ To strengthen Gosatomnatzor and its TSO SEC NRS in the field of Non-Destructive Testing (NDT) of Components
- ☞ Improvement of the In-Service Inspection (ISI) practice of safety related components by:
  - ◆ Removing eventual shortcomings in the present Russian ISI practice
  - ◆ Procurement of novel western NDT equipment
  - ◆ Training of experts in the use of different equipment



## Technical Basis for Russian and West European NDT Qualification TACIS/R/TSO/05 Project

### Objectives of the Project (2)

- ☞ To provide assistance to Russian Safety Authorities in the assessment of reactor safety improvements and on-site programmes
- ☞ To strengthen Gosatomnatzor and its TSO SEC NRS in the field of Non-Destructive Testing (NDT) of Components
- ☞ Improvement of the In-Service Inspection (ISI) practice of safety related components by:
  - ◆ Removing eventual shortcomings in the present Russian ISI practice
  - ◆ Procurement of novel western NDT equipment
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### Scope of the Project

The project covers the 3 following activities, divided in 13 tasks:

1. Assessment of Russian ISI concept for meeting structural integrity requirements for VVER and RBMK NPPs (tasks 1 to 8)
2. Identification and familiarisation with Western NDT equipment using digital flaw detection technology by the Russian Regulatory Body (tasks 9 to 11)
3. Assistance to the Russian Regulatory Body in evaluating current inspection qualification systems by applying suitable features of the ENIQ European Network for Inspection Qualification) approach (task 12). Provision of an observer status for the Russian Regulatory Body on selected NDT relevant European activities concerning structural integrity (task 13).



**Technical Basis for Russian and West European NDT Qualification  
TACIS/R/TSO/05 Project**

## **Details on Project Tasks (1)**

### **Activity 1 on ‘Assistance in the assessment of the Russian ISI concept’**

- **Scope of inspection and defect evaluation by ISI methods used in Russian Nuclear Power Plants is considered mostly sufficient**
- **Use of mechanised or automatic ISI systems is needed for reliable documentation of defects and reduction exposure of ISI personnel**



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## **Details on Selected Project Tasks (2)**

**Activity 1 on ‘Assistance in the assessment of the Russian ISI concept’**

**Task 1: EU specialists to provide a list of points for assessing the ISI schemes**

**Task 2: Russian specialists to provide available information on points list**

**Task 3: EU specialists to preliminarily review the response prepared by the Russian specialists**

**Task 4: Description of comments by Russian specialists of the current ISI practices in Russia**

**Task 5: EU specialists to make final review of the Russian specialists give recommendations on the ISI practices on the Russian NPPs**

**Task 6: Common EU and Russian expert assessment of the Russian ISI practices**

**Task 7: EU specialists proposal for upgrading Russian ISI practices**

**Task 8: Desirable solutions by Russian specialists for upgrading Russian ISI**



**Technical Basis for Russian and West European NDT Qualification  
TACIS/R/TSO/05 Project**

## **Details on Project Tasks (3)**

### **Activity 2 on ‘Russian familiarisation with Western NDT equipment’:**

- **Technical Specifications provided by EU specialists for selected NDT equipment**
- **Russian specialists identified an ultrasonic testing system to be procured within this project: not realized, but was decided to be done in another project (note: this supply project was not programmed in further TACIS Annual Action Plans)**
- **Training of Russian specialists in AEA T, VTT, IZFP**
- **Proposal for a Russian training center prepared by EU specialists with organisational, personnel, hardware and software prerequisites and requirements**



**Technical Basis for Russian and West European NDT Qualification  
TACIS/R/TSO/05 Project**

## **Details on Project Tasks (4)**

### **Activity 2 on ‘Russian familiarisation with Western NDT equipment’:**

**Task 9: Identification and procurement of EU NDT equipment: presentations by AEA T (Ultrasonic Testing (UT) equipment capable of TOFD), by IZFP (UT equipment capable of SAFT), by VTT (manual scanner) and corresponding technical specifications. Russian identification of equipment: SAFT capable equipment and manual scanner. Procurement not realized**

**Task 10: Training of 2 Russian specialists in using NDT equipment: in UK (mainly UT, and Eddy Current Testing (ET) courses); IZFP (mainly UT and ET, scanner courses); VTT (mainly UT, and ET, Acoustic Emission courses)**

**Task 11: ISI site experience for the specialists of the Russian Regulatory Body: visit to Loovisa NPP (Finland)**





**Technical Basis for Russian and West European NDT Qualification  
TACIS/R/TSO/05 Project**

## **Details on Project Tasks (5)**

### **Activity 3 on ‘Russian familiarisation with the ENIQ approach’:**

- **Successful achievement with Russian Experts familiarised in the ENIQ approach to ISI qualification through a seminar held on 25-26 November 1997**
- **Comparison of Inspection qualification methods developed in EU and USA (Performance Demonstration of ISI). Advantages of the ENIQ approach have been demonstrated combining blind and open tests and technical justification**



**Technical Basis for Russian and West European NDT Qualification  
TACIS/R/TSO/05 Project**

## **Details on Project Tasks (6)**

### **Activity 3 on ‘Russian familiarisation with the ENIQ approach’:**

**Task 12: Features of the ENIQ approach. The main objective within the task was to assess qualification of the NDT systems proposed by the Russian operating organization**

**Additional Task 13: To have Observer status of representatives of the Russian Regulatory Body as observers into the ENIQ (European Network for Inspection Qualification) and NESC (European Network for Evaluating Steel Components) programs: not done**



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## Summary (1)

- For the activity on ‘Assistance in the assessment of the Russian ISI concept’: all tasks have been performed. Further comparison of inspections procedures should be done, and necessary modifications made afterwards
- For the activity on ‘Russian familiarisation with western NDT equipment’: Equipment selected; Training performed; NDT equipment procurement not carried out and proposed to be done afterwards
- For the activity on ‘Russian familiarisation with the ENIQ approach’: Information provided through a ENIQ seminar
- Proposal made by EU Consortium at the end of present project to continue by establishing a Training Center and a Center for NDT Inspection Qualification. A future implementation of a Center for NDT Inspection Qualification still pending.
- Procurement of equipment in the course of a TACIS service project extremely difficult: new TACIS rules are now separating into different contracts the service and the equipment parts



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### Summary (2)

- ☞ This project should lead to improvements in the In-Service Inspection of Russian nuclear power plants and also qualification inspection associated with this. It should be noted that the Russian regulatory body comprehends the importance of the task, as it would allow assessing the adequacy of proposed ISI methods as well as inspection qualification for equipment, procedures and personnel.
- ☞ Training and transfer of knowledge to the personnel of the Russian Regulatory Body done at meetings of the EU and Russian Experts.
- ☞ The following main Russian organizations contributed to this mostly successful Project: Gosatomnadzor (GAN) of Russia, Scientific and Engineering Centre for Nuclear and Radiation Safety (SEC NRS) of GAN, NIKIMT, Atommash Plant, OKB Hidropress .

