



# **Role Of Slovakia Within The IAEA Decommissioning Related Activities**

**Vladimir Michal, Marian Stubna  
VUJE, Inc., Slovakia**

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# National Background : NPP A1

## Decommissioning Project – Stage I

### Main goals:

- to bring NPP A1 into the radiation safe conditions
- to create conditions for complete dismantling of A1 – stage II-V

Duration: 1996-2007/2008

Overall budget: 300 mil. USD

### Project tasks:

- Management of damaged spent fuel assemblies (1996 – 1999)
- Protection of Environment
- Main Generation Building
- RAW Treatment and Conditioning
- Technical Support



# TCP SLR/4/008 „Remotely Operated and Robotic Technologies for D&D of A1 NPP

(approved for 2001/2002 and extended up to 2006)

## Objectives:

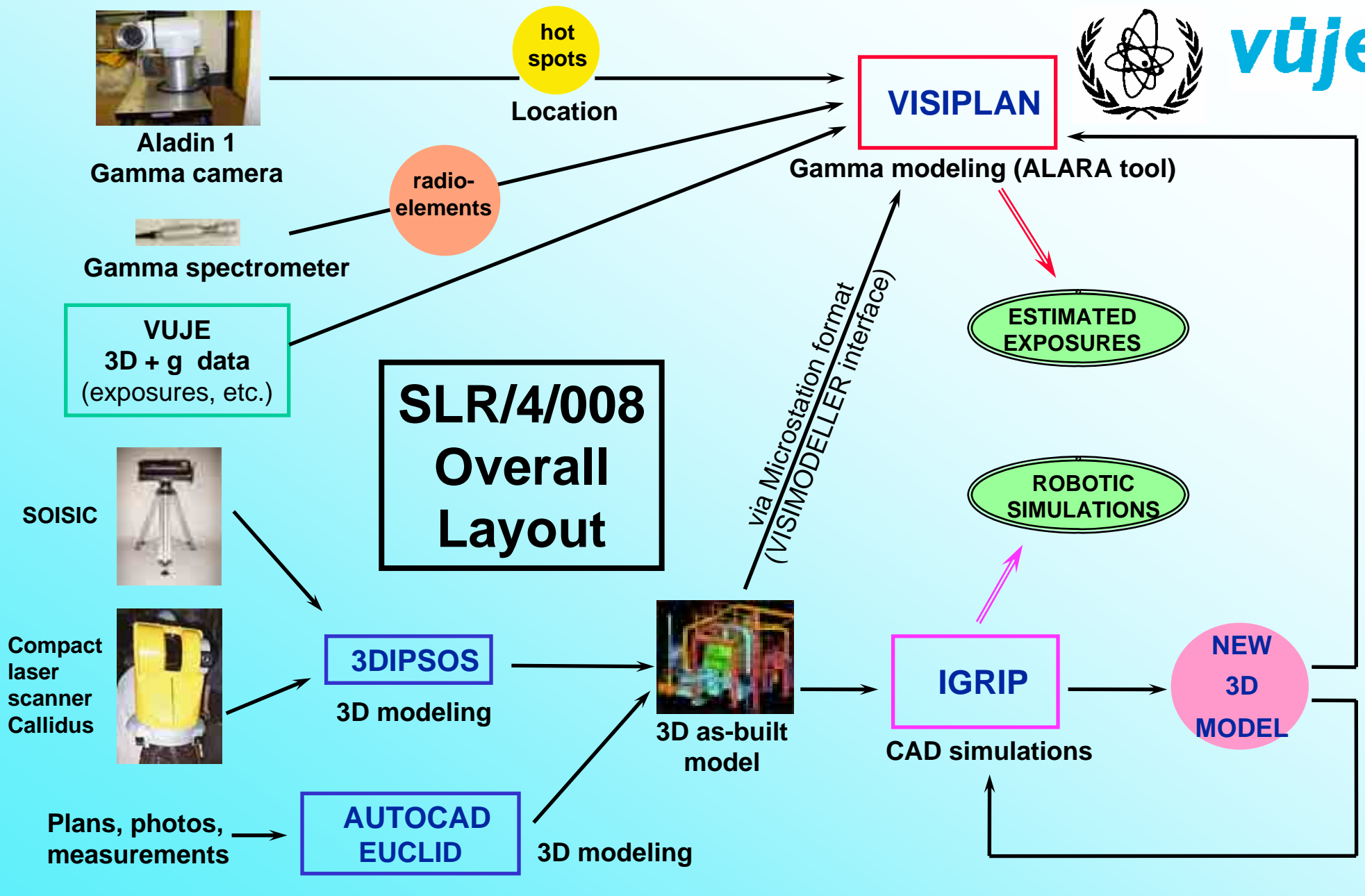
- To upgrade national capability with the specific state-of-the-art technologies for D&D
- To develop, test, adapt and apply CA robotic, remote handling and viewing systems for D&D of the Bohunice A1 NPP and to perform CA simulations, 3D acquisitions and 3D modelling
- To reduce personnel radiation exposure and environmental impact during D&D work thanks to the better preparation of work procedures, CA simulations, acquisition of as-built data, creation of as-built models of equipment, etc.

# Background of TCP SLR/4/008

VUJE (main counterpart and general supplier of NPP A1 D&D Project) and SE VYZ (now it is JAVYS, Inc.\*) had some key technologies (3D laser scanner SOISIC, CAD software, gamma camera Aladin1 etc.) as well as a special department with qualified personnel (basic training) from 2000.

Nevertheless, improvement of technology and skills of personnel including creation of chain for acquiring and processing of geometrical and radiological data was necessary.

\* JAVYS – state owned Nuclear Decommissioning Company



**Proposed Processing Chain for 3D & gamma acquisitions, 3D & gamma modeling and CAD simulations**

# Brief Summary of TCP SLR/4/008 Achievements (1)

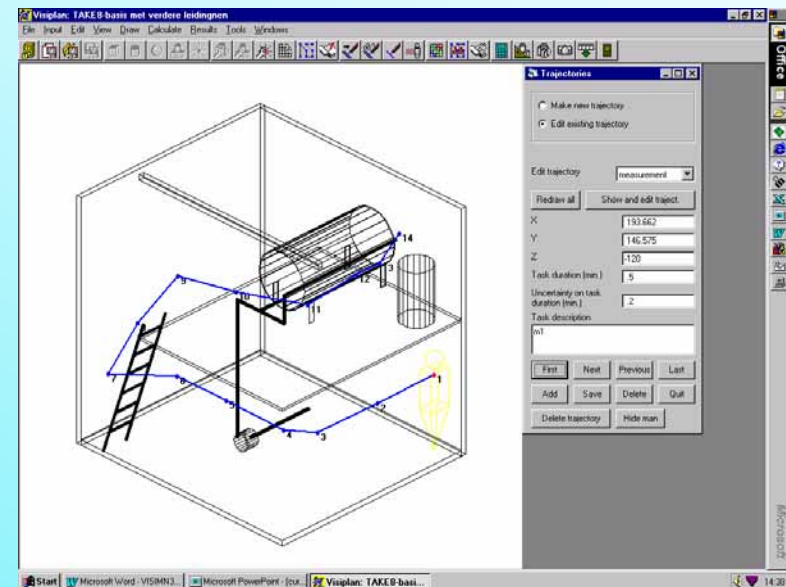
- Delivery of software system IGRIP (Interactive Graphics Robotic Instruction Program) used for advanced simulation and programming of robots and remote handling manipulators (hardware was also delivered and on-site training of personnel was organized)
- Laser scanner Callidus was supplied including modeling software 3Dipsos, training of personnel and support of common scanning missions with EDF
- Delivery of software Cyclone CloudWorx, that allows transfer of laser scanners cloud of points to CAD system



# Brief Summary of TCP

## SLR/4/008 Achievements (2)

- Support of improvement of A1 NPP old gamma camera Aladin1 and corresponding software
- Delivery of ALARA 3D planning and modeling tool VISIPLAN developed by SCK.CEN
- Software VISIMODELLER for transfer of complex 3D models (as-built 3D laser scanned models) from CAD software Microstation directly to VISIPLAN and training of personnel were also delivered and organized



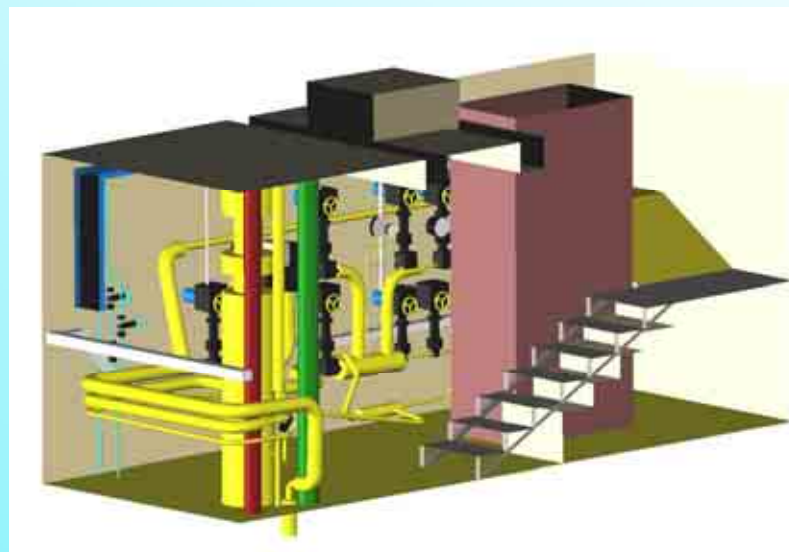


# Brief Summary of TCP SLR/4/008 Achievements (3)

- Supply of a gamma spectrometry system Canberra, High Performance Liquid Chromatography system for the A-1 NPP radioactive waste characterization and supply of the other equipment (e.g. sensors, dose ratemeter)
- Organization of expert missions to Slovakia; support of participation of Slovak experts at the international D&D conferences, training courses and scientific visits
- Support of preparation of a Feasibility Study for Regional Decommissioning Training Center in Eastern & Central Europe.

# Brief Summary of TCP SLR/4/008 Achievements (4)

- Support of organization of „National Workshop for Decommissioning Training Center“ (11/2004), WS „Broadening the basic technologies of nuclear dismantling / regional activity within CEEC“ (6/2005) and VISIPLAN workshops (10/2004, 10/2006).



# TCP SLR/3/002 „Management of Historical RAW from the A1 NPP Decommissioning“

(approved for 2007/2008 and extended for 2009-2011)

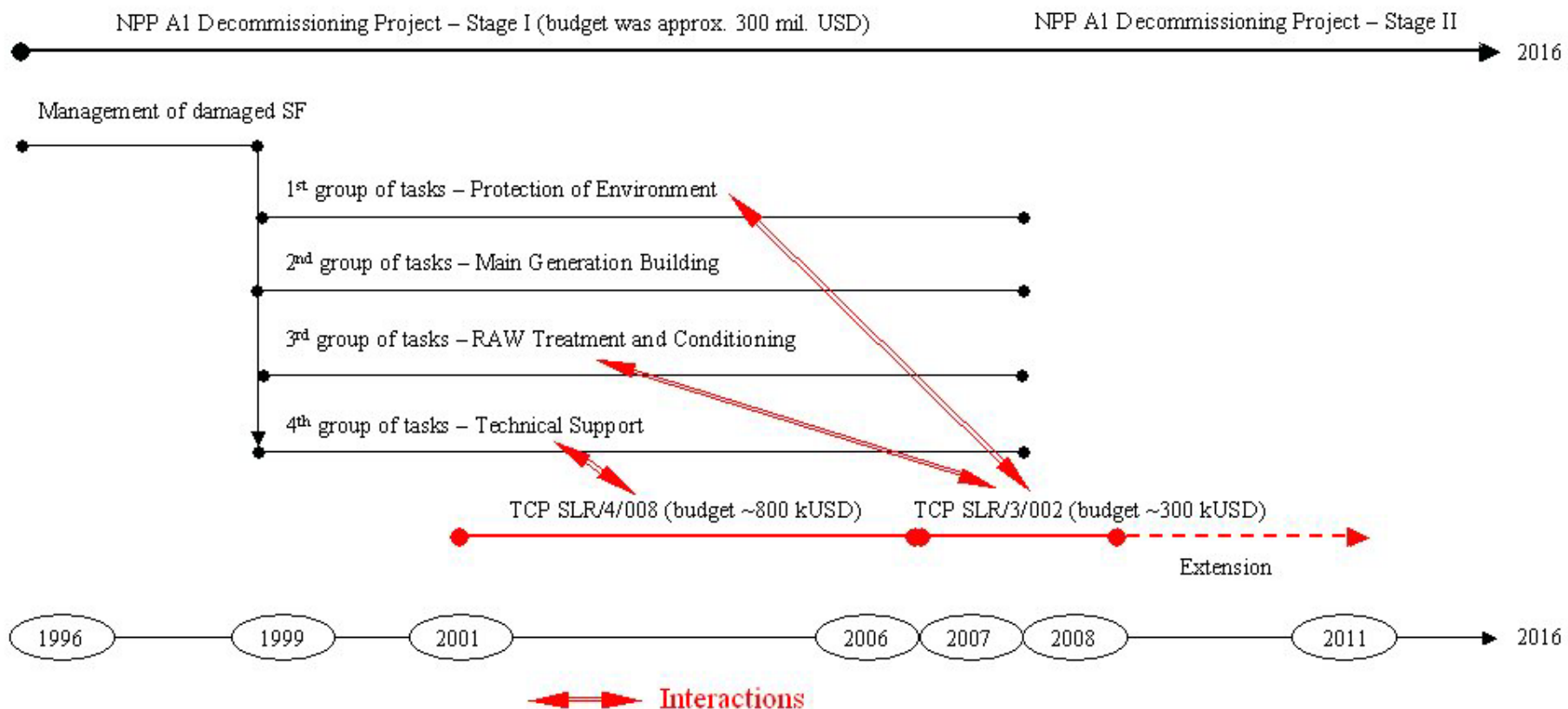
## Objectives:

- To establish and implement state-of-the-art methodology, programmes and equipment for treatment, conditioning and disposal of non-standard and historical RAW from the A1 NPP
- To train qualified personnel to improve safety in fields related to the project objective(s)
- The methodology, programmes and equipment will be used for the above-mentioned RAW treatment, conditioning and disposal and/or for evaluation of material for unrestricted release.



# Interactions between the A1 NPP D&D activities and TC national projects SLR/4/008 and SLR3/002

NPP A1 Decommissioning (Stage I and part of Stage II)





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# Involvement of Slovakia in TC program for other countries

Assistance to following countries was provided:

- Armenia (several expert missions, several visits to Slovakia)
- Bulgaria (hosting of specialists for technical visits and discussions)
- Egypt (scientific visits to Slovakia)
- Latvia (several expert missions, several visits, delivery of technology)
- Lithuania (several visits to Slovakia)
- The Ukraine (several expert missions, several visits to SR)
- Russia (expert mission)



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# TCP RER/3/005 “Support in Planning the Decommissioning of NPPs and RRs” (1)

## Objectives:

- To assist Member States in developing adequate strategies and plans for decommissioning of NPPs and RRs consistent with IAEA recommendations
- To facilitate the exchange of information, experience and lessons learned among MSs in the region
- To increase the competence of experts involved in decommissioning these facilities.



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# TCP RER/3/005 “Support in Planning the Decommissioning of NPPs and RRs” (2)

## Objectives:

- Participants of the NPPs part – Armenia, Bulgaria, CR, Croatia/Slovenia, Hungary, Lithuania, RF, SR, The Ukraine
- Slovakia has the role of Leading Country Coordinator for NPPs part of the project
- Slovakia would be the recipient of services as well as the provider of expert’s support.





# International Decommissioning Network (1)

Regional project RER/3/005 represents an important part of International Decommissioning Network (IDN), which was established by the IAEA to bring together existing decommissioning initiatives both inside and outside the IAEA to enhance cooperation and coordination.

The IDN is expected to provide:

- Opportunities to support participating nuclear facilities or Member States, particularly those with less developed decommissioning industries, by providing access to relevant skills, knowledge and projects ...

# International Decommissioning Network (2)

- Forum in which specialist advice and technical guidance may be provided on the Agency's program in the area of decommissioning
- A mechanism whereby decommissioning experts may exchange information under the aegis of the Agency to pursue the promulgation of good practices and the longer term retention of knowledge in support of decommissioning plan implementation
- An expanded range of training and demonstration activities, especially demonstration projects with a regional or thematic focus providing hands-on, user-oriented experience.



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# International Decommissioning Network (3)

- Slovakia is an active member of the IDN Steering committee
- Besides the overall planning of network activities Slovakia proposes also hosting of several IDN events in the next planning period (2009-2011), e.g. costing workshop, practical demonstration of decommissioning of small nuclear facilities etc.

# Conclusion – Lessons Learned (1)

- Slovakia is a good example of a small country with a relatively comprehensive decommissioning program that was able to utilize effectively the Agency TC support, in combination with its own activities, for increasing of skills of personnel and improvement of technical equipment.
- The country was/is the recipient of the IAEA assistance, but is also able to offer and implement donor assistance and expert services to other countries.

## Conclusion – Lessons Learned (2)

- More significant involvement in the IDN activities is proposed during the next IAEA planning period.
- It is suitable to start simple and progress to more complex D&D problems mainly through exercises, which are the best way to learn.
- It can be also noted, that intensive and open communication between main counterparts and the IAEA technical and country officers is very important aspect of TC projects implementation success.