INNOVATIVE ECONOMY
NATIONAL COHESION STRATEGY

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

Preparation of TSO support for Polish nuclear power programme in the area of nuclear safety and public information

T. Jackowski *, M. Borysiewicz, S. Potempski, K. Różycki

National Centre for Nuclear Research (NCBJ), Poland

IAEA expert meeting 21-24 May 2013

Świerk Computing Centre

Fukushima Daiichi NPP nuclear accident. Polish response (1/2)

For Polish society:

- the information about earthquake and tsunami in Japan *was the tragedy of Japanese people*.
- the information about *situation in Fukushima Daiichi NPP was a shock*. It seemed not possible in so modern country to have an serious accident in NPP.

Polish media response to the tsunami:

- Very soon the media started to merge horrible consequences of earthquake and tsunami with the nuclear accident.
- In some antinuclear publications this process continues even today.

The Polish Embassy in Japan:

- created an *emergency team* studying all the information in place and transmitting verified information to us day and night.

The President of the National Atomic Energy Agency:

- released only information obtained from the IAEA (which was usually two days late).

Fukushima Daiichi NPP nuclear accident. Polish response (2/2)

NCBJ (preparing itself to the role of TSO):

- studied, evaluated and explained the development and consequences of accident to Polish media.
- group of people for several months after the accident strongly (or even constantly) involved in situation assessment.

The team

- Special dedicated team designated to respond to nuclear events.
- **Department of Education and Trainings** is permanently taking care of a 6-7,000 visitors to MARIA reactor, presenting them broadly the very basics of nuclear power plants functioning. It also leads a number of radiation safety courses.

Division of Nuclear Energy (EJ1)

This group of experts is supported by a wider team, which is **Division of Nuclear Energy (EJ1) within the NCBJ**. The Division was set up soon after **creation of NCBJ** itself, which emerged **in 2011 from two separate research institutes**.

The EJ1 staff is composed of analysts:

- of thermal-hydraulic processes, CFD, transport of radioactive materials in the cooling system and further in the containment, atmosphere, water and food chain.

Work in teams:

deterministic and **probabilistic** analyses, **fuel and neutronic** analyses in the core developing **new reactor technologies** and working on **public reactions to nuclear installations**.

- 46 people (highly experienced specialists, young engineers and physicists employed within the last three years - undergoing intensive training).
- new personnel selected and employed continuously.

INNOVATIVE ECONOMY
NATIONAL COHESION STRATEGY

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

NCBJ international cooperation

EDUCATION, TRAINING AND USE OF MODERN TOOLS

The most important partners of this process are: **IAEA, NEA, European organizations like NUGENIA, SARNET, SNETP, NURESAFE** as well as R&D and TSO partners and technology suppliers.

In EU FPs NCBJ:

- development of the Real-time On-line, **DecisiOn Support System (RODOS)** for the off-site management of nuclear emergencies, implemented in the Centre for Radiological Events (CEZAR) of the National Atomic Energy Agency (used operationally for over ten last years).
- NCBJ has acted as technical support organization in this field, being **responsible for further development, customization and maintenance** of the system. One of the important areas of *customization is parameterisation of food-chain and ingestion models, including identification of radioecological regions.*

Decision making process

Supporting decision making process - countermeasure strategy to minimize effects of the contamination in the intermediate and late phases after nuclear accidents.

National planning and response for protective actions by:

authorities, expert organizations, industry, producers and the public.

Facilitated workshop is one of the ways, which provide a potential methodology for stakeholder's involvement in the decision making.

POLAND:

Methodology within the **EU VATECH project, "Information Requirements and Countermeasure Evaluation Techniques in Nuclear Emergency Management** (later in national exercises).

•This approach significantly facilitates public communication and informing.

The Centre of Excellence **MANHAZ**

Many activities under the Centre of Excellence **MANHAZ (Management of Health and Environmental Hazards)** have been expanded into the realm of hazards analysis and its applications to conventional plants. The main achievements in this field have been:

- *Development of methods, models and computer programs* for assessing health and environmental risks related to major accidents of nuclear and chemical installations, and transportation of dangerous substances.
- *Development of computer-aided emergency decision support systems* for complex technical facilities.
- *Preparation of guidelines and training materials* for risk assessment from industrial installations, and for **Security Vulnerability Analysis**.

Świerk Computing Center (2010-2015)

- Świerk Computing Centre, currently under development, will provide powerful computational infrastructure for High Performance Computing.
- 96 mln zł, dedicated building, 5000 CPU
- Calculations for the w polish science and power business

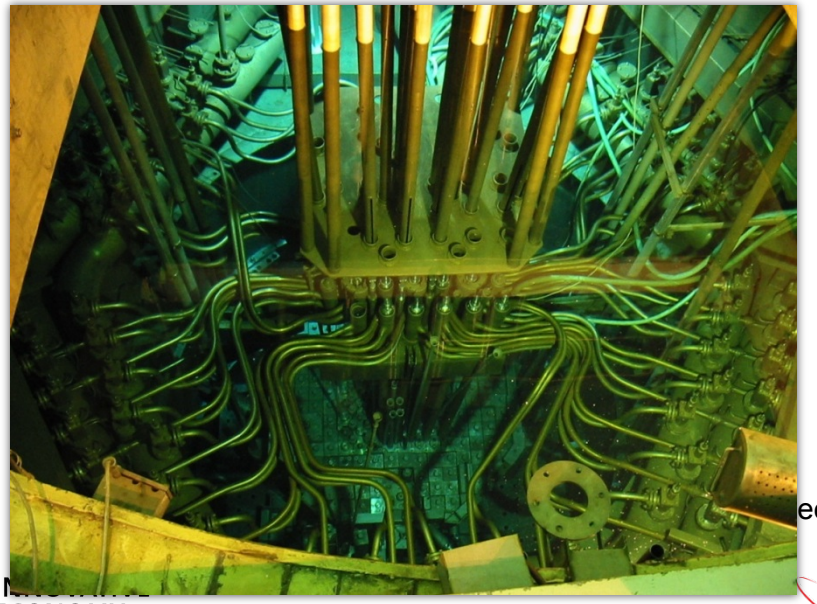
Centrum Informatyczne Świerk

Support for the polish nuclear power

- ✓ Reactors safety analysis
- ✓ Severe accidents simulations
- ✓ Severe accidents consequences elimination planning
- ✓ Development of the methods and software

The MARIA research reactor

The MARIA research reactor with its **30MW power and high neutron flux** is one of the best facilities in Europe to train new professionals, to conduct materials research and manufactu-re radioisotopes.



NCBJ participates in international *research programmes devoted to nuclear reactors, thermonuclear fusion and plasma physics. The partnership is planned between* ***Jules Horowitz Reactor*** *and MARIA reactor.*

Integrated **R**isk **I**nformed **D**ecision **M**aking (**IRIDM**)

- The new approach in the decision making process recently promoted by IAEA and the **US Nuclear Regulatory Commission**.

The **IRIDM** process for each potential option accounts for:

- standards and good practices;
- operational experience;
- results of deterministic and probabilistic safety analyses;
- considerations of organisational security and economic factors;
- insights from research.

Thus the IRIDM process can provide the **balanced safety decision** – by considering **all relevant key elements** in an appropriate way, in particular **human and organisational factors** important for nuclear safety, taking account the risk posed by them to facility.

Thank you for your attention

tomasz.jackowski@ncbj.gov.pl

INNOVATIVE ECONOMY
NATIONAL COHESION STRATEGY

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND