REGULATORY APPROACH TO THE LONG TERM OPERATION OF CZECH NUCLEAR POWER PLANTS

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Czech Republic is situated approximately in the geographical centre of Europe, has an area of 78,866 km$^2$ and about 10.5 mil. inhabitants;
Consisting mostly of three historic regions of Bohemia, Silesia and Moravia;
It is a landlocked country 326 km from the Baltic and 322 km from the Adriatic Sea;
It shares borders with Germany (810 km), Poland (762 km), Austria (466 km) and Slovakia (265 km).
CR NUCLEAR INSTALLATIONS

Map of Czech Republic showing nuclear installations and surrounding countries.
NPP Dukovany

- VVER 440 - 213, 4 units
- PWR, 6 loops, 2 turbines
- confinement
- 1360 MWt, 440 MWe
- operation since 1985 - 1987

- dry interim storage of spent fuel (cask-type, CASTOR),
- regional shallow land repository of radioactive waste to accommodate all future low and intermediate radioactive wastes from both nuclear power plants
NPP Temelín

- VVER 1000 – 320, 2 units
- PWR, 4 loops, 1 turbine
- full-pressure containment
- 3000 MWt, 1000 MWe
- operation since 2004

→ dry interim storage of spent fuel (cask-type, CASTOR) in preparation for construction
ABOUT SUJB

SUJB
- governmental body headed by chairman appointed by the government - created from former CSAEC in 1993
- responsible for governmental administration and supervision in the fields of uses of nuclear energy and radiation and of radiation protection. Non-proliferation of chemical and biological weapons.

⇒ The authority and responsibilities - Act. No. 18/1997 (Atomic Act):

⇒ State supervision of nuclear safety of nuclear facilities, nuclear items, physical protection of nuclear facilities, radiation protection, industrial safety and emergency preparedness of nuclear facilities and workplaces handling ionizing radiation sources

⇒ Licensing of activities as specified by Act. No. 18/1997, e.g. for the siting, commissioning and operation of nuclear facilities
ABOUT SUJB

- Reviewing and approving documentation related to nuclear safety and radiation protection as laid down by The Atomic Act, limits and conditions for the operation of nuclear facilities
- Coordination of activities of the radiation monitoring network
- Maintaining the national system of nuclear materials accountancy and control, national record-keeping systems for licensees, selected import and export items, ionizing radiation sources, and exposure of the public and personnel handling ionizing radiation sources
- Cooperation with the International Atomic Energy Agency
- Providing information concerning the results of the SUJB activities to public
- Providing information concerning the results of the SUJB activities to the government of the Czech Republic.

MORE INFORMATION

http://www.sujb.cz
MATERIAL AND HUMAN RESOURCES OF THE SUJB

→ **2007**
  - **staff**: 197 (2/3 are nuclear safety and radiation protection inspectors)
  - **budget**: 350 million Czech Crowns (17.5 million US $)

→ **Advisory groups** of independent experts
  - nuclear safety
  - radiation protection
  * Activity of these groups is not regulated by the law, they undoubtedly became a significant advisory body for important issues of nuclear safety and radiation protection.
The basic legal regulations governing the licensing and approval process for nuclear installations are:

- Construction Act (No. 186/2006 Coll.);
- Atomic Act (No. 18/1997 Coll.) and related Decrees (e.g. on QA, Design, Operation);

Other important regulations in this area are:

- Administrative Procedure Act (No. 500/2004 Coll.);
- State Inspection Act (No. 552/1991 Coll.);
- Environmental Impact Assessment Act (No. 100/2001 Coll.)
SUJB APPROACH TO LTO

SUJB stated Basic Conditions for lifetime extension (1996):

- consumption of the design service life of the components, systems, and buildings - controlled aging programs,
- solution of the departures from the applicable international standards and application of the operational experience,
- compliance with SUJB requirements,
- innovation programs.
SUJB APPROACH TO LTO

Consumption of the design service life

- current conditions of main components detected during in-service inspections, regular operability tests, and by degradation phenomena monitoring

- controlled aging programs have been prepared for safety important components
SUJB APPROACH TO LTO

Deviations and their solutions

- mainly safety problems which were identified by IAEA for this model line of NPPs (results of PSR)

- issues are categorized, their solution is required by the SUJB decisions and checked by its inspectors

- to be able to obtain additional operating license, NPP must document that main problems in higher level of importance categories have been sorted out
SUJB APPROACH TO LTO

Compliance with the SUJB requirements

- conclusions from SUJB inspections
- conclusions included in SUJB decisions
- conclusions from the Safety Analysis Reports (and other documentation which is subject to the approving procedure)
- individual fields of the NPP operation are analyzed using SUJB safety indicators (development trends)
SUJB APPROACH TO LTO

NPP modernization programs

- innovation and reconstruction of systems and components that can affect safety (e.g. I&C)

- modernization programs have ever been discussed between NPP and SUJB
NEW LEGAL REQUIREMENTS

→ operation licenses issued based on FSAR and its revisions after ten and twenty years of operation

→ PSR results provided to SUJB just recently

→ some requirements are missing in Czech regulations (conditions of regulatory decisions)

→ PSR will be performed also after 30 years of operation in 2015
NEW LEGAL REQUIREMENTS

- WENRA harmonization – missing reference level requirements will be reflected in new regulations

- LTO guide will be prepared based on results of the IAEA EBP SALTO

- Legal requirements on PSR
LEGAL BASIS FOR PSR

- SUJB asked for the PSR through the conditions which might be a part of SUJB approvals (decisions)
- SUJB adopted (translated) IAEA PSR SG
- New revision of Atomic Act (under preparation) will include requirements on PSR
- PSR period is 10 years
Content in compliance with IAEA NS-G-2.10

14 Safety Factors divided into 5 groups:

- **Nuclear Power Plant** (plant design, actual condition of SSC, EQ, ageing)
- **Safety Analysis** (deterministic, probabilistic, hazard analysis)
- **Operation and Operational Feedback** (safety performance, operational feedback from other plants and from research findings)
- **Management** (organization and administration, procedures, human factors)
- **Environment** (radiological impact on the environment)
PSR ELABORATION

- PSR done mainly by utility staff
- „Set of Assessment Criteria“ (national – Czech legislation, international – IAEA SGs) and „Methodology of Assessment“ prepared by contractors
CONCLUSIONS

- Fulfillment of SUJB Basic Conditions is essential precondition for lifetime extension
- Basic documents for the operation licenses are updated FSARs and PSR reports
- Issuance of the NPP operating licenses are stated in compliance with the international practice