1. Introduction
The project manages development of methodological guidance and provision of methodological support of all procedural steps necessary for the development and validation of:

- **Safety Management Guidelines** (SMGs) development for full power, low power and shutdown states; and
- **Symptom Based Emergency Operating Procedures** (SB EOPs) for shutdown states.

2. Objectives

**General objectives** of the project:

- Transfer the international practice in NPP safety assurance during the process of SMG and SB EOP development and training sessions and to the power and shutdown states in NNSG Energoatom;
- Reduce the availability of human errors during diagnostic and decision making while responding to an incident, which could occur in a shutdown state of the reactor;
- Improve accidents which could occur both in a power condition and shutdown state of the reactor;
- Improve emergency management system at Kosel Nuclear Power Plant (KPP);
- Give basis to NNSG Energoatom for the development of the modern Accident Management Programme.

3. Global scope

The types of reactors and respective pilot units that are included in the scope are:

- WWER-1000/302 (South Ukranian NPP Unit 1);
- WWER-1000/302 (South Ukranian NPP Unit 2 & Unit 3); and
- Reactor Unit (RU), Standard SB EOP SR, Refueling Plan (RP).

4. SMAG development

**4.1 SMAG objectives**

- Assist in setting up of criteria defining the beginning of escalation of the boundary design basis accident to the severe phase of its development;
- Identify the symptoms (i.e. parameters and their values) by which the staff of the Unit in emergency could identify the status of critical safety functions.

4.2 SMAG activities

**Subclause 4.2.1: Preparation work for the emergency management guidelines**

- Identify the computational aids and diagnostic tools required in the emergency management strategies for the pilot NPP units;
- Identify the staff of the Energoatom pilot and non-pilot units to be involved in SMAG activities;
- Prepare a list of training contents to be covered in SMAG sessions.

**Subclause 4.2.2: Identification of severe accident management strategies and severe accident management guidelines (SMG) with the SMGRU**

- Develop and validate a complete set of Severe Accident Management Guidelines for the pilot NPP units;
- Harmonize the SMGs with other emergency operating documents acting at the pilot NPP units;
- Disseminate the project results to the other (non-pilot) Units in accordance with the strategy of the NNSG "Energoatom".

5. EOP's Development

**5.1 EOP's Objectives**

- To prepare a Point Event Identification (PEI) for the NPP's main and secondary systems (the whole set of the safety barrier);
- To assess the system performance during the postulated accident scenarios.

5.2 EOP's activities

**Subclause 5.2.1: Development of the initiating Event (IE) list for the shutdown reactor state**

- Write a procedural guideline (PG) for the development and validation of the SMG for the shutdown reactor state.

**Subclause 5.2.2: Development of an accident management strategies and SB EOP SR (Consultant and End User/Beneficiary team)**

- Develop the Accident Management Guidelines and Emergency Operating Procedures for the pilot NPP units.

5.3 Specific results for SMAG development

**Subclause 5.3.1: Identification of severe accident management strategies and possible actions**

- Identify and develop diverse accident management strategies for the pilot units:
  - WWER-1000/302 (South Ukranian NPP Unit 1);
  - WWER-1000/302 (South Ukranian NPP Unit 2 & Unit 3);
  - Reactor Unit (RU), Standard SB EOP SR, Refueling Plan (RP).

**Subclause 5.3.2: Development of PECs/IEs groupings**

- Develop and validate a complete set of Severe Accident Management Guidelines for the pilot NPP units.

**Subclause 5.3.3: Support to the End User/Beneficiary to endorse it before commencement of subtask 3.5.**

- Review and agree on the technical report for Subtask 3.5.

5.4 Specific results for SMAG development

**Subclause 5.4.1: Identification of severe accident management strategies and possible actions**

- Identify and develop diverse accident management strategies for the pilot units:
  - WWER-1000/302 (South Ukranian NPP Unit 1);
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- Develop and validate a complete set of Severe Accident Management Guidelines for the pilot NPP units.

**Subclause 5.4.2: Development of PECs/IEs groupings**

- Develop and validate a complete set of Severe Accident Management Guidelines for the pilot NPP units.

**Subclause 5.4.3: Support to the End User/Beneficiary to endorse it before commencement of subtask 3.5.**

- Review and agree on the technical report for Subtask 3.5.

6. Summary

The end user/beneficiary team was involved in all technical sessions of SMAG activities. The staff of the Energoatom pilot and non-pilot units have gained the theoretical knowledge and practical skills of drafting, following and application of the whole set of the SMGs and SB EOPs.

- End User/Beneficiary team to validate the SB EOP SR for the two pilot Units.
- To develop and validate a complete set of Severe Accident Management Guidelines for the pilot NPP units.
- To develop and validate a complete set of Severe Accident Management Guidelines for the pilot NPP units.

**References**


**George Halov, Dobrin Grigorov, Kaliopa Mancheva**