Safety Analysis Strategic Program (SASP) for CNE Prod Cernavoda

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Introduction

Purpose and content of the Cernavoda NPP Unit 1 SASP

- Objectives
- Specific directions
- Categories of problems to be covered
- Review of the today's situation(computer codes)
- Implementation strategy
- Discussion

SASP Purposes

The SASP is prepared to cover the activities required to be fulfilled during the medium and long term periods (the expected period covers the 2000-2004 time interval)

- The main objectives of the SASP are:
  - to ensure the plant is operated inside the analyzed envelope
  - to fulfill the regulatory body requirements
  - to come up against the duties assumed by Romania signing the International Convention for Safety.

SASP Specific Objectives

- To ensure the specific support required to maintain the plant inside the analyzed envelope defined based on the safety analysis results

- To develop own capabilities to compile and perform safety analysis, in order to come up against the duties assumed by Romania signing the International Convention for Safety

Each specific objective is detailed by specific directions

Each specific direction is detailed by specific activities

SASP Objective1 - Specific directions

- D1 - Identify and document properly the analyzed envelope
- D2 - Identify the aspects which request supplementary details/clarifications/ parameters or procedures developments
- D3 - Assurance that the operating documents adequately reflect the operating envelope
- D4 - Development of the capabilities to sustain the best estimate approach
- D5 - Development of the own capabilities to elaborate system thermalhydraulic analysis in order to sustain the design changes which request new system thermalhydraulic analysis

SASP Objective2 - Specific directions

- D6 - Development of a strategy to elaborate accident analysis as per “Proposed Regulatory Guide on Safety Analysis of CANDU Nuclear power plants “ (C-6) proposed by AECB and development of the capabilities required to perform such analysis
- D7 - Development of the capabilities to support the PSA studies
- D8 - Development of the capabilities to support the severe accident analysis domain
- D9 - Technical support for the staff training on simulator
- D10 - Integration in the research and development programs at COG/AECL level.

SASP Categories of problems to be covered

- Revisions of the Safety Report analysis
- Evaluate the problems encountered by other CANDU similar plants
- Supplementary documentation of the limits/parameters presented by OP&P and IM
- Possibility of relaxation of the OP&P or IM constraints
- Possibility to analyze new heat sink configurations
- Support for trip coverage evaluations
- Support for system thermalhydraulics analysis
- Complete safety analysis set by the analysis specified by the C6
- Support analysis for the PSA project Level 1 and future Level 2 and 3

Today's Situation

- Safety analysis presented by Cernavoda Safety Report are based on computer code sets which cover reactor physics, thermal-hydraulics, fuel, fuel channel, moderator, containment, atmospheric dispersion and doze calculations.

- The codes are interconnected, the results of some codes being used as input by the other codes in order to fulfill the analysis purposes.

Today's Situation (Cont'd)

- During the commissioning process, some of the codes have been used by the Cernavoda staff in order to presimulate/postsimulate some commissioning tests (i. e. RFSP, FIREBIRD, NUCIRC,etc)

- For some other codes, specific input data sets have been produced in order to represent and incorporate the Cernavoda plant data (i. e. PRSCON, PEAR, etc)

Activity categories that conduct to the realization of the SASP objectives and directions

- Review and development of the procedural framework for the maintenance, development and use of safety analysis computer codes
- Evaluation of the assumptions, input data of the actual safety analysis set
- Safety analysis performance

SASP and Implementation strategy

- Sets of safety analysis have been identified in order to fulfill the program's objectives and associated directions
- For each analysis, the set of computer codes required have been identified
- For each analysis, an initial starting point has been established and based on the expected duration the final term has been estimated
- The safety analysis to be performed is an open list, it has not to be considered closed, and new analysis has to be added function of the operating or regulatory requirements
- The safety analysis list will be reviewed by each time this is considered necessary

SASP and Implementation strategy (Cont'd)

- 3 phases implementation strategy
  - acquisition of computer codes and hardware equipment
  - staff training
  - development of specific plant models and preparation of new safety analysis as required by operation, licensing, PSA and severe accidents evaluations

SASP and Implementation strategy (Cont'd)

Acquisition of computer codes and hardware equipment:

- code acquisition strategy based on:
  - the domain covered by the code
  - code complexity
  - code training requirements

SASP and Implementation strategy (Cont'd)

- Human resources that will be involved into the process
  - Cernavoda Safety Analysis staff
  - SITON Bucuresti and ICN Pitesti staff based on contractual arrangements
- Specific training for the staff involved in the process
- Review of the specific procedures
- Development of specific models for Cernavoda site
- Perform specific analysis in accordance with the SASP specifications

Conclusions - Invitation for discussion

SASP presents the actions to be performed in the medium and long term in order to revise systematically and develop the safety analysis for Cernavoda NPP

SASP framework :

- Specific objectives and directions
- Safety analysis computer codes list (for SA and Severe accident analysis)
- SASP and implementation strategy
  - Staff training
  - Models development
  - Safety analysis