

EXECUTIVE SUMMARY

Upon request from the South African National Nuclear Regulatory Authority (NNR), a peer-review mission on the implementation of risk informed in-service inspection programme of Koeberg Nuclear Power Plant was provided under the IAEA Safety Service on Safe Long Term Operation (SALTO).

The NNR received request from the plant operator Eskom to use a Risk-Informed In-service Inspection (RI-ISI) programme for Class 1 and Class 2 piping that is required to be inspected as part of the American Society of Mechanical Engineers (ASME) Section XI based ISI programme as well as selected augmented inspection programmes. The RI-ISI programme was implemented as an alternative to the ASME Section XI requirements for the third inspection interval which started in 2006 for Unit 1 and 2007 for Unit 2. The risk-informed process used is based on Electric Power Research Institute (EPRI). The RI-ISI Programme has been incorporated during the first period of the Third Ten-Year In-service Inspection Interval for Koeberg Nuclear Power Plant.

This particular activity is defined as an Expert Mission within the IAEA SALTO peer review safety service to support the NNR by an independent review and so called second opinion on RI-ISI approach application to the Koeberg plant.

To accomplish the objective of the mission, the IAEA asked two international experts, i.e. Mr. Bjorn Brickstad from Swedish Radiation Safety Authority, Sweden and Mr. Gregory Werner from the US NRC, USA. The experts reviewed the advanced information and documents received prior the mission. The mission was organized and conducted by the IAEA technical officer, Mr. Ervin Liszka.

Twelve (12) participants from the NNR and Eskom attended and were part of the mission work. On the first day of the mission, the experts presented the areas of interest which were discussed on days two and three including a short plant walk down. After the two-day discussions and subsequent further review of the documents and clarification of questions draft issue sheets with description of findings were prepared.

The Eskom personnel was very responsive and cooperative throughout the mission, providing presentations and full access to plant documents, reports and other supportive information available as required for the expert review.

The team identified a few technical areas which could be improved and raised four (4) issues in the areas of:

1. ISI and review of RI-ISI;
2. PSA results application;
3. Risk evaluation, and
4. Damage mechanisms and failure probabilities.

Two recommendations and four suggestions were provided.