OSART Good Practices
OPERATIONAL EXPERIENCE FEEDBACK
Use of PSA and PSR

Neckerwestheim, Germany

Mission Date; 8-24 Oct., 2007

Use of operating experience for determining plant-specific reliability indicators for probabilistic safety analysis.

The plant uses all sources of internal operating experience for determining reliability data for plant-specific probabilistic safety analysis.

Probabilistic Safety Analyses (PSA) are used as an addition to the safety evaluation based on deterministic fundamentals. In the Neckarwestheim NPP Event Analyses section (ZS section), the existing PSAs for power and no-power operation were updated and stage 2 of the PSA was added for power operation. New PSAs will be made available by the end of the year for the cross-plant events of fire and earthquakes.

The assessment indicator for each PSA is the core damage frequency. For a valuable PSA, up-to-date plant-specific reliability data must be used. This requires continuous analysis of operating experience of the components modeled in the PSA.

Neckarwestheim NPP has been recording plant-specific failure data since 1994. This involves analyzing fault reports, maintenance and test reports as well as job orders, and documenting in a database any failures of PSA-relevant components in the form of event reports. The database also includes the so-called master data (plant identification and technical features such as design and operating values) and annually updated operating reports (component lifetimes and standby times, repair, isolation and outage times, test intervals) for all components modeled in the PSA. The completeness or quality of the data collection is ensured by storing all reports relevant for the analysis in the operations management system and by a peer checking method in event assessment.

The event and operating reports for one year are sent to the central reliability and event database, to which all German nuclear power plants, as well as the Siemens/KWU plants at Borssele (NPP in the Netherlands) and Gösgen (NPP in Switzerland) supply failure data.

The benefits for the plant are:
- Incorporation of the current technical status and operational experience of the plant itself.
- Improvement of the statistical dependability of the reliability data by making use of the operational experience of similar plants.
- Meaningful PSAs for the plant itself (assessment of modifications, modification of test frequency).