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The Periodic Safety Review of ANSTO's OPAL Reactor

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Outline of Presentation

- Introduction and Outline of Presentation
- Licensing Requirement
- PSR Guidance
- Implementation of the PSR
- Results of the PSR
- PSR Supplement
- Lessons Learned
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Licensing Requirement

- Original licence contained condition requiring PSR and SAR Update every 10 years
- Revised licence contained condition only for PSR at agreed intervals
- Licence conditions also require international peer review of PSR
- NB: Licence revised by Australian Regulator ARPANSA as part of project to standardise licences for controlled facilities

PSR Guidance

- No formal international guidance on PSR for a Research Reactor although some national practices
- ANSTO chose to use IAEA Safety Standard NS-G-2.10: PSR for NPPs modified to reflect its application to a relatively new research reactor and applying a graded approach
- A draft Regulatory Guide on PSR issued by ARPANSA for review; status currently unknown

PSR – Safety Factors

Plant

- (1) Plant design
- (2) Actual condition of SSCs
- (3) Equipment qualification
- (4) Ageing

Safety analysis

- (5) Deterministic safety analysis
- (6) Probabilistic safety analysis
- (7) Hazard analysis

Performance and feedback of experience

- (8) Safety performance
- (9) Use of experience from other plants and research findings
- (10) Organization and administration
- (11) Procedures
- (12) The human factor
- (13) Emergency planning

Environment

- (14) Radiological impact on the environment

Global assessment

PSR Implementation

- Applied standard ANSTO project management process to PSR
- Main areas for discussion:
 - Project management
 - Project plan and task briefs
 - Project implementation
 - International peer review
 - ANSTO safety committees review

Project Management

- Brought in a very experienced and expert Project Manager (PM) knowledgeable of OPAL
 - Managed and coordinated overall project
 - Provided support and advice to reviewers
 - Facilitated resolution of differences between reviewers/safety factors
 - Coordinated review of resultant PSR report
 - Contributed to Global Assessment and drafted Action Plan

Project Management

- PM supported by professional technical writer from OPAL Configuration Management Group
 - Collated inputs from individual reviewers and prepared PSR report
 - Collated list of recommendations
 - Ensured consistent use of English and terminology throughout
 - Provided early feedback to reviewers to obvious errors and/or inconsistencies

Project Plan and Task Briefs

- Project Plan required by ANSTO project management process; identified objectives, proposed approach, roles and responsibilities and timescales
- Task Brief prepared for each Safety Factor; identified specific objectives, background, requirements, generic elements of review, suggested approach and specific deliverables

Project Implementation

- PM arranged regular project review meetings that enabled
 - Project Plan to be revised
 - Issues and topics affecting multiple Safety Factors to be discussed
 - Identified potential inconsistencies between Safety Factor reviews
 - Cross-fertilisation between reviewers

International Peer Review

- Requirement of licence condition
- Initially considered utilising IAEA but due to time and resource limitations, arranged directly using network of contacts
- International Peer review conducted over one week by four experts from The Netherlands, France and the USA
- Report incorporated into overall PSR report with no changes

ANSTO Safety Committees Review

- PSR report, including International Peer Review subject to internal safety review by:
 - ANSTO Safety Assurance Committee: ANSTO's overarching safety review and approval body
 - OPAL Reactor Assessment Committee: sub-committee of SAC with specialist reactor expertise
- RAC Chair delegated responsibilities due to integral involvement in PSR

Results of PSR

- High degree of conformity with current international safety standards and practices
- Licensing basis remains valid
- Some variation in the level of maturity of OPAL processes
- No shortcomings that pose an immediate or significant risk to health and safety
- No unresolved shortcomings
- No degradation of defence in depth

Result of PSR – Recommendations

- Recommendations were made for improvements and/or further assessments where appropriate
- Recommendations placed into one of three categories: essential, should be considered and observations – may be beneficial
- A program for implementation of the recommendations is currently in progress

PSR Supplement

- ARPANSA preliminary review identified a number of issues:
 1. Accuracy of individual statements
 2. Adequacy of supporting evidence/references
 3. Overall assessment of systems/processes
 4. Supporting evidence for recommendations
 5. Overall assessment of common themes and root causes

Supplement Review

- Items 1, 2 and 4 addressed by review of PSR report by independent reviewer
- Item 3 addressed by original experts on Safety Factor basis
- Item 5 addressed by independent review
 - Identifying theme or root cause for each recommendation
 - Collating themes and root causes common across Safety Factors

Common Themes and Root Causes

- Changing requirements in standards
- Opportunities for improvement
- Asset management
- Business processes
 - Sub-divided into 5 secondary themes
- SAR/OLC/SPI update
- Time/resource limitations in completing PSR

PSR Supplement Report

- Complimentary to original PSR report, not a replacement, containing tables of
 - corrections and changes
 - revised supporting references
 - overall system/process assessment
 - review of recommendations
- Included a revised global assessment that addressed themes and root causes

Lessons Learned

- Treat a PSR as a normal project, using standard project management tools
- Appoint specialist Project Manager, preferably one with experience with the facility
- Provide adequate and appropriate support resources; ensures technical experts concentrate on technical issues, not on report writing

Lessons Learned

- Encourage communication between experts; project meeting organised and facilitated by PM a particular benefit
- International peer reviews also provide a focus for review team to complete their work
- IAEA Safety Standard NS-G-2.10 considered very useful but care required to ensure appropriate graded approach relevant to facility

Lessons Learned

- The PSR will be beneficial to the facility beyond the assessment of safety :
 - Identifying operational and organisational issues that improved overall performance
 - Themes and root causes that may be applicable across larger organisation
 - Strategic planning and prioritisation of follow-on actions

Conclusions

- A PSR constitutes a comprehensive assessment of the safety of a facility that can also have significant operational and organisational benefits
- The OPAL PSR identified no immediate or significant safety shortcomings, although a number of areas for improvement were identified

Conclusions

- The PSR Supplement generally supported the original PSR with some additional areas for improvement identified
- Identification of themes and root cause common across Safety Factors was very beneficial and facilitated the strategic planning and prioritisation of follow-on actions



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Thank You

