Development and Implementation of a Nuclear Criticality Safety Program at AECL's Chalk River Laboratories

Lloyd E.G. Dunn

Presented by C. Racicot

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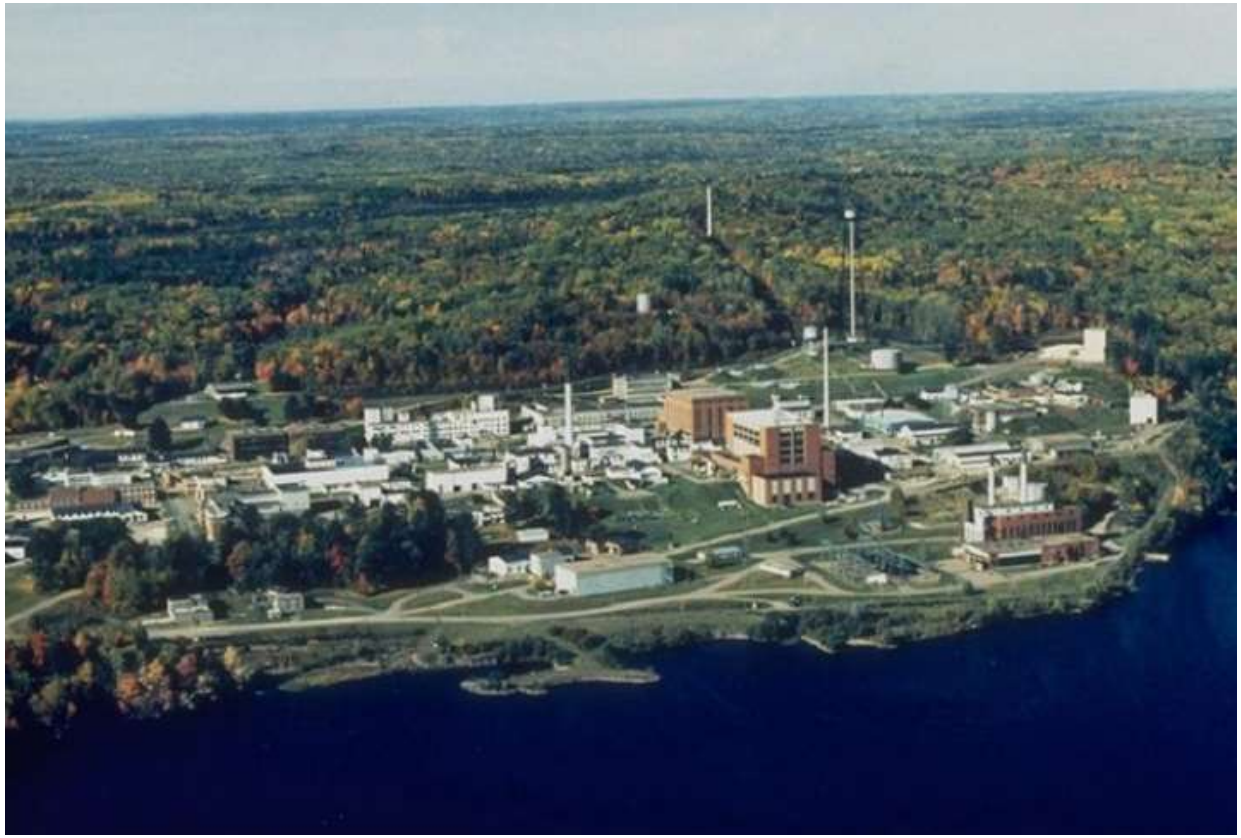
Outline

- Introduction
- History
- New Licence Conditions
- Development of a Nuclear Criticality Safety (NCS) Program
- Implementation of the NCS Program
- Present Status
- What's still to do
- Conclusions

Introduction
Chalk River Laboratories



History

- NCS not new at AECL
- No Canadian Nuclear Safety Commission (CNSC) regulations or specific Licence Conditions
- AECL processes and procedures

AECL Processes and Procedures Before the NCS Program

- Criticality Safety Document (CSD):
  1. Summary of Fissionable Materials Limits and Restrictions
  2. Activity Description
  3. Nuclear Criticality Safety Analysis
- Nuclear Criticality Control Officer (NCCO)
- Nuclear Criticality Safety Panel (NCSP)
- NCS-related documents:
  - Requirements for NCS
  - Guideline for review and approval by the NCSP
  - Terms of reference for the NCSP

New Licence Conditions

- Discussions with CNSC
- New Licence Conditions at Chalk River Laboratories as of 2006 August
  - Upper Subcritical Limit
  - Nuclear Criticality Safety Program
  - Schedule for implementation
  - Implement on a risk graded approach

NCS Program Development

- Assemble the team
- Understanding requirements
- Areas for improvement
- Preparing the team
- Establishing roles and responsibilities
- Developing Program documentation

NCS Program Development
Areas for Improvement

- Frequency of occurrence of abnormal events
- Standardizing processes and procedures
- Clear acceptance criteria
- Increase in service provider resources
- Planning
- Regular visits to facilities
- Develop and participate in working groups

NCS Program Implementation Challenges

- Switch from previous process that has been in place for many years
- Forty-five CSDs to be revised at present, others coming
- Never done probability assessment for NCS before
- Very little standardized processes
- Diversity of areas
- Facilities must continue to operate
- Documentation management needs improvement
- Shortage of NCS knowledgeable people

NCS Program Implementation
What To Do First

- Documentation management
- Standardizing processes and procedures for support services
- Planning
- Training
- Establishing and retaining expertise in NCS

Present Status

- Documentation in place:
  - Requirements
  - Process
  - Various procedures for writing CSDs, conducting analyses
- Initial visits to all areas
- General training material prepared
- Updating of first CSD underway, which is also testing the procedures

CSD Revision Process

- Establish the agreement between the facility and the service providers
- Team is formed consisting of facility personnel and service providers
- Carry out the probability assessment
- Carry out the nuclear criticality safety analysis
- Revise the CSD
- Submit to the NCSP

Revision of First CSD

- Established and documented the process
- Struck formal agreement between facility and service providers
- Facility and analysts together to carry out the probability assessment
- Completing the probability assessment
- Getting ready to have it handed over to criticality safety analyst

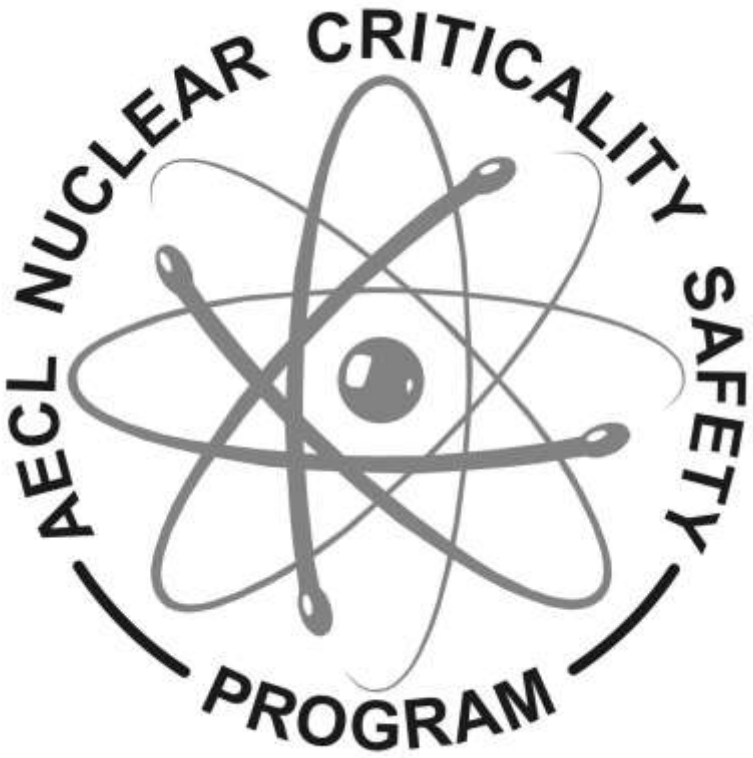
Still To Do

- Complete revision to first CSD and obtain approval from NCSP
- Adjust processes and procedures as required
- Complete revision to all of the CSDs
- Secure commitments for sustained and reliable NCS-related services
- Work with facilities to help them develop facility-specific training material
- Ensure that all CSDs and references included in the CSDs, are available
- Complete the remainder of the implementation

Conclusions

- Big job with many challenges
- Going to take a long time to fully implement
- Need to be customer focused
- Need to make things easy to follow
- Need to ensure adequate training
- Need to ensure adequate documentation management
- Progress is being made
- Reasonably well received

NCS Program Logo

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