Opening Remarks for the MAPLE Reactors
Day 1 Licence Renewal Hearing
August 18, 2005
Dr. David Torgerson
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AECL

Slide 1: Title

Good morning Madam Chair and members of the Commission, and thank you for the opportunity to make some introductory remarks associated with our licence renewal application for the MAPLE reactors. For the record, I am Dave Torgerson, Senior Vice President and Chief Technology Officer for AECL.

I am accompanied here today by Dr. Ken Hedges, Vice President, Dedicated Isotope Facilities (which will be now referred to as DIF); Mr. Paul Lafrenière, Chalk River Site Licence Holder and General Manager of DIF Operations; as well as key members of the AECL team who have been working on this very important project.

Slide 2: Introduction

The AECL Board of Directors, the Executive and senior management team are deeply committed to the successful completion of the MAPLE Reactors and New Processing Facility. When we were granted our license in 2003, there were a number of issues that were of concern to the Commission. We took those concerns very seriously and have taken steps to address each one.

The completion of the Dedicated Isotope Facilities is vital to Canadians and to thousands of people around the world. To ensure success, we have strengthened our team and senior management oversight. We have established, and are committed to, a comprehensive improvement program that supports safe, high quality operation, and draws on the lessons learned by others in the industry. We are focused on meeting all criteria related to health, safety, security, the environment, and Canada's international obligations. And, we are committed to resolving technical issues, completing nuclear commissioning and producing medical isotopes during this next license period.

Today we will summarize the actions we have taken and the infrastructure we have put in place since 2003 to support our application for a two-year licence renewal, and to answer any questions the Commissioners may have.

I will now turn our presentation over to Dr. Ken Hedges. Thank you.

MAPLE Reactors

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Dr. Ken Hedges

Vice President, Dedicated Isotope Facilities

Slide 3: Dedicated Isotope Facilities

Good morning Madam Chair and members of the Commission. For the record, I am Ken Hedges, Vice President, Dedicated Isotope Facilities.

The Dedicated Isotope Facilities consists of the MAPLE 1 and MAPLE 2 reactors and the New Processing Facility. The Iodine 125 Production Facility is located within the MAPLE 1 reactor building.

Slide 4: Presentation Outline

I am pleased to update the Commission on:

- The measures we have taken to strengthen our team and senior management oversight,

- The progress we have made on the performance improvement plan,
- The performance of the MAPLE reactors during the current licence period;
- The plan for commissioning and operation during the next 2-year licence period, and
- To review the progress to resolve the positive Power Coefficient of Reactivity.

Slide 5: Senior Management Oversight

I am pleased to update you on the Dedicated Isotope Facilities organization. This organization manages all aspects of the DIF Operations and the remaining project design and commissioning work.

My role as Vice President of DIF is to ensure that DIF organization receives the highest level of commitment from senior management and that issues are being addressed in a timely and systematic way. I receive regular updates from my team and I ensure that the AECL Board of Directors and Executives are kept up to date. The Executive is updated weekly on the progress of DIF. DIF is also a standing item at all Board of Directors meetings.

The DIF General Manager, Paul Lafrenière, reports directly to me. He is responsible for ensuring that all activities related to operations are in full compliance with AECL Nuclear Operations and CNSC requirements. Reporting to Paul Lafrenière is the DIF Production Manager (MAPLE, NPF Facility Authority), who has the combined responsibility for the MAPLE reactors and New Processing Facility. This ensures a consistent approach for the safe operation and maintenance in compliance with all applicable licences, permits, laws and regulations, policies and procedures.

The new Project Engineering, Procurement and Commissioning team under Lawrence Lupton is responsible for all project engineering, procurement, construction and commissioning for

the MAPLE reactors, MAPLE Iodine Production Facility, and the New Processing Facility.

We have appointed a highly experienced Director, Kuldip Singh, to lead QA and have strengthened and expanded the QA function both in operations and the project to address concerns previously identified.

We have put in place a facility oversight process, which ensures appropriate management review of all non-routine activities. We have strengthened operations by adding a licensing & safety function. We have launched a Human Performance program, which emphasizes conservative decision making.

A dedicated task team has been formed to oversee the resolution of the positive power coefficient of reactivity (PCR). This task team includes experts from design, safety analysis, commissioning, licensing, operations, and AECL R&D groups.

The DIF organization ensures management oversight and operational risk review in an integrated manner. This integrated team ensures that safety and quality practices are enforced.

Slide 6: Safe and High Quality Operation

We are committed to operating the MAPLE 1 and MAPLE 2 reactors to ensure safe, reliable and environmentally sound performance. DIF Operations has adopted a Five Point strategy for upgrading the overall performance of the plant, people, procedures and processes. This strategy includes:

- Frequent intrusive independent audits using Industry peers;
- A facility wide program of Self-Assessments with a focus on Conduct of Operations;
- DIF Operations Program Health Report;
- A facility monthly performance reporting system;
- Consolidating all improvement efforts under the DIF Operations Comprehensive Improvement Plan.

We have responded to lessons learned from the unplanned events during the current licence period. Some of the steps taken to improve operating performance are:

- Strengthening the facility management oversight;
- Addition of a dedicated Safety & Licensing group to DIF Operations;
- Implementation of an operations risk review process;

- Engaging industry peers in Root Cause Analyses teams to improve the quality of the events investigations; and
- Providing mentoring and strengthening support for operational decision-making using industry best practices.

We have issued a Corporate Disclosure policy. Under this policy, we have taken steps to enhance our public consultation activities.

We have also improved communications with CNSC staff in regards to DIF Operations issues and progress.

We have regular communications with all AECL staff involved with the DIF Organization. In these communications, we remind everyone about the importance of safe and reliable operation of the Dedicated Isotope Facilities. We provide regular updates on the objectives, the accomplishments and the path forward. Feedback from all staff is encouraged.

Slide 7: Safe and High Quality Operation (cont'd)

The DIF Operations Comprehensive Improvement Plan focuses on:

- Clear understanding of Roles & Responsibilities;
- Improved Human Performance;
- Improved Processes and continuous performance evaluation;
- Development of Equipment Performance Program.

Some of the activities to enhance our employees understanding of their roles and responsibilities are:

- Conduct of Operations expectations implemented with assistance from industry peers;
- A facility wide program of Self-Assessments; and

Some of the activities to enhance human performance are:

- Increasing dedicated AECL resources in accordance with the DIF Operations Staffing Plan.
- Filling all management positions.
- Using industry peers to guide and mentor staff during workshops, and to provide Observation and Coaching.

Some of the activities related to the Equipment Performance program are:

- Conducting reliability testing and surveillance of the equipment and analyze the data;
- Preparing a Facility Configuration Baseline document
- Developing a Preventive Maintenance Program;
- Implementing a DIF Safety Relief Valve program;
- Implementing a System Health Monitoring and other engineering programs under the guidance of industry peers.

Slide 8: Safe and High Quality Operation (cont'd)

The corrective actions from the Departure from Guaranteed Shutdown State event involved the following activities:

- Placed MAPLE 1 and MAPLE 2 in GSS
- Completed a Root Cause Assessment
- Issued a revised Operational Limits and Conditions (OLC) document. The CNSC designated officer has approved revision 9 of the OLCs.
- Issued a MAPLE reactor shutdown states document

- Engaged industry consultants to review the site OPEX Program and work with AECL to make improvements.

All wire re-termination work required before removal of MAPLE 1 from GSS has been completed.

DIF Managers meet regularly with NRU Managers to share experiences and review lessons learned.

An event reporting procedure for the MAPLE reactors, which is based upon CNSC Standard S-99, has been implemented. The intent is to improve our performance and to be consistent with the utility practices.

Slide 9: Safe and High Quality Operation (cont'd)

We recognize that public accountability is essential. As such, We are committed to sharing information to foster openness and transparency.

Some examples on how AECL is engaging the public are:

- A toll-free number as well as contacts for information are well advertised and on AECL's website.

- Meeting held in December 2003 with the Concerned Citizens of Renfrew County and Sierra Club to discuss ways to improve information transfer. Subsequent offers have been made for further meetings.
- Continued sharing of information with elected officials, First Nations and interested members of the public through scheduled meetings, community events, special projects. We are also sharing all reportable events classified as Significance Level 1 and 2.
- Provide project-specific briefings and tours to all community stakeholders.
- Information on medical isotopes and MAPLE is available on both MDS Nordion's and AECL's web pages.

Some examples on sharing information on our environmental performance are:

- Consultation meetings were held in January 2005 on the Ecological Effects Review of the Chalk River Laboratories.
- Copies of AECL's annual environmental monitoring reports, corporate annual reports and project-specific program materials provided to all community stakeholders.

Slide 10: Safe and High Quality Operation (cont'd)

As noted at previous Commission meetings, AECL's Chief Regulatory Officer provides oversight of AECL licensing compliance programs.

AECL management and executives meet regularly with their CNSC staff counterparts to discuss the progress in resolving regulatory issues and to provide updates on the status of the MAPLE reactors.

All commitments to address regulatory issues are tracked and monitored against the project milestones. We regularly update the CNSC staff on the status of the commitments to facilitate progress towards achieving these milestones.
We believe the working relationship between AECL and CNSC staff is professional and effective.

Slide 11: MAPLE Reactors Performance

As would be expected with the reactors in a shutdown state, worker dose and radioactive releases were well below regulatory limits.

There were no fires in the MAPLE 1 and MAPLE 2 reactors during the current licence period.

There was one lost-time accident in the MAPLE 2 reactor during the licence period. There were no lost time accidents in MAPLE 1 during the current licence period.

Slide 12: MAPLE Reactors Performance (cont'd)

The CNSC staff has rated the AECL programs and their implementation in seven Safety Areas. We wish to comment on the work to improve our performance in the two C-rated implementation areas.

With respect to Operating Performance, a contributing factor to the departure from GSS event was that the prerequisite documents for Operations staff were not available. Documentation summarizing the definitions and requirements for each shutdown state and the procedures are now in place. Operators have been trained on this new information.

In addition, operation risk review, management oversight and work practices were upgraded.

As described earlier, we are improving our performance with the implementation of an event reporting procedure, which is based upon CNSC Standard S-99.

With respect to Performance Assurance:

- We have updated the Quality Assurance manuals for DIF Operations and the Project to address findings from AECL's assessments and various audits.
- The training program for Managers, Operations and Reactor Operators has been updated. We have successfully recertified 6 Managers, Operations and 10 Reactor Operators. We currently have 11 Reactor Operators certified.
- 7 new Reactor Operators and one new Manager, Operations have taken the CNSC certification exam.

In addition, we wish to highlight some of AECL's initiatives to improve our Environmental Protection program:

- In May 2004, AECL obtained ISO-14001; 1996 Environmental Management System certification for the Chalk River Laboratories. This standard calls for a

continual improvement of our environmental performance, and we are committed to this effort.

- AECL has appointed a Chief Environmental Officer and formed a senior environmental committee to oversee environmental activities.
- All employees receive defined, mandatory training on AECL's environmental policy and programs.
- AECL completed an Ecological Effects Review for the Chalk River site in 2005 January, which has been accepted by the CNSC staff.

Slide 13: ***Operating Plan for Next Licence Period***

At this time, DIF Operations has nearly completed all of the work AECL believes is necessary to obtain CNSC staff approval for the MAPLE 1 reactor to leave the Guaranteed Shutdown State and enter operation at 2 kW. We anticipate CNSC staff's review of our documents will be completed very soon.

The operating plan for the MAPLE 1 Reactor is:

- Operate to 2 kW to establish routine operations
- Operate to ~ 5 MW to perform PCR related tests
- Operate to 8 MW to test PCR mitigation features

- Produce irradiated isotope targets for NPF commissioning
- Complete commissioning above 8 MW
- Progress to In-Service.

At this time, the project is completing all of the work necessary to finish MAPLE 1 Iodine Production Facility Phase A Commissioning. The operating plan for the MAPLE 1 IPF is:

- Complete Phase A and Phase B Commissioning
- Progress to In-Service.

At this time, the MAPLE 2 Reactor is in the reference Guaranteed Shutdown State. The operating plan for MAPLE 2 reactor is to complete Phase B Commissioning up to 500 kW.

Slide 14: Positive Power Coefficient of Reactivity

To ensure that all practical options of design and operation have been considered to remedy the positive PCR, AECL is implementing the following plan.

The first phase of the plan involved assessing AECL's current understanding of the behaviour of MAPLE and defining a set of

options for mitigating the positive PCR. The following steps have been taken:

1. AECL performed a systematic formal review of all phenomena that could cause a positive PCR and ranked them in order of importance. This ranking was described in a report submitted to the CNSC.
2. AECL assessed the physically feasible options for mitigating the positive PCR. These design options were described in a report submitted to the CNSC.
3. AECL has contracted the Idaho National Laboratory to predict the PCR using independent models and code calculations. The results of the study are expected to be available at the end of September.
4. AECL has contracted the Brookhaven National Laboratory to perform an independent review of the AECL work on the PCR. The results of the review are also expected to be available at the end of September.

The second phase of the plan will refine the options, based on the information gathered during the first phase. Additional information is being gathered from out reactor tests. Plans are being developed to perform tests in the MAPLE 1 reactor at high power. All of this information will be used to define and

commit to a mitigation strategy. The results of these investigations will be documented and submitted to the CNSC.

Slide 15: Summary

In summary, Madame Chair, Members of the Commission, I believe that the issues are being appropriately managed and are being resolved with the highest priority on safety.

The completion of the MAPLE 1 and MAPLE 2 reactors is vital to Canadians and to thousands of people around the world. To ensure success, we have strengthened our team and senior management oversight. We have established, and are committed to, a comprehensive improvement program that draws on the lessons learned by others in the industry. We are focused on meeting all regulatory criteria.

The steps we have taken to strengthen DIF Operations will improve our safety performance. Our operating plan for the next two years is to complete the commissioning of the MAPLE 1 reactor and establish safe reliable operation. In addition, we plan to complete the commissioning of the

MAPLE 1 Iodine Production Facility, and to perform nuclear commissioning in the MAPLE 2 reactor.

This ends my presentation in support of AECL's application for a two-year licence for the MAPLE reactors.