AECL Year 2000 Program

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• AECL’s is an engineering, design and development organization whose principal products are:
  – The CANDU PHW Power Reactors (18 units in operation worldwide)
  – Maple Research and Medical Isotope Production Reactors
  – Macstore Dry Fuel Storage
  – Various Nuclear services

• Head office and engineering design centre in Mississauga, Ontario; major research and development laboratories at Chalk River, Ontario; R&D facilities at Whiteshell Laboratories, Pinawa, Manitoba
AECL’s Year 2000 Program Overall Scope

- to address the Year 2000 issues and their resolutions related to the systems, products and facilities, equipment and operations of their own and of its clients in the various facilities worldwide

- to meet AECL’s obligations to its clients and stakeholders in respect to the objectives of the Year 2000 Program
Year 2000 Program Objectives

- To meet the definition of Year 2000 conformity requirements as defined in the: Standard for Year 2000 Conformity - British Standards Institute - DISC PD2000-1: 1998 [Ref. 1]
  - For all computer equipment and products and for all purchased products with embedded processors as the Year 2000 approaches and during and after that year.

- Where it is not practicable to achieve full Year 2000 compliance, to ensure systems and product are Year 2000 useable, i.e.
  - “suitable for continued use into the year 2000 even though the computer or application is not fully Y2K compliant”

- To have a process and documentation trail which demonstrates that due diligence has been exercised in respect of the Year 2000 issue.
Year 2000 Communications with Clients

- AECL Informs its clients:
  - of necessary Y2K compliance activities or remedial measures (as they become known to AECL) which are required to attain product compliance or readiness status,
  - of 3rd party products supplied to them which may have associated Y2K compliance problems, and of the assessed compliance status of such products, as known by AECL,
  - of pertinent aspects of Y2K program status, schedule,
  - of pertinent Y2K compliance information regarding the successful performance of AECL-responsible corrective action and repair activities
  - of changes in the compliance status (as known by AECL) of 3rd party supplied products
AECL’s Year 2000 Organization

BOARD OF DIRECTORS

PRESIDENT & CHIEF EXECUTIVE OFFICER

VICE PRESIDENTS
- COMMERCIAL OPERATIONS
- FINANCE & CFO
- HR & ADMINISTRATION
- MARKETING & SALES
- RESEARCH & PRODUCT DEVELOPMENT
- STRATEGIC DEVELOPMENT

VICE PRESIDENT YEAR 2000 PROGRAM

PROJECT DIRECTOR Y2K PROGRAM
INFORMATION TECHNOLOGY INFRASTRUCTURE

PROJECT DIRECTOR Y2K PROGRAM
CLIENT & SUPPLIER INTERFACE

PROJECT DIRECTOR Y2K PROGRAM
ENGINEERING SYSTMS & PRODUCTS

PROJECT DIRECTOR Y2K PROGRAM
AECL LICENSED & EXPERIMENTAL FACILITIES

PROJECT LEADER OPERATIONS SUPPORT

GENERAL COUNCIL & CORPORATE SECRETARY
INTERNAL AUDIT

EXTERNAL AUDIT
LEGAL CONSULTANTS
STEERING COMMITTEE
LEGAL
QUALITY ASSURANCE
HUMAN RESOURCES
Major Steps of the Year 2000 Compliance Process

Step 1  Inventory Compilation
Step 2  Business and Technical Compliance Assessment
Step 3  Risk Assessment and Management
Step 4  Corrective Action and Repair
Step 5  Contingency Planning
Step 6  Testing
Step 7  Reporting
Step 8  Sign off

KEY PROGRAM-WIDE PROCESSES:
communication, documentation, quality assurance, project control
Year 2000 Program Status

- awareness and early Y2K compliance work began in 1996 (Wolsong DCC’s Y2K testing by the Wolsong project team)
- development and planning of formal Year 2000 Program - 1997
- formal Year 2000 Program launched - early 1998
- The Year 2000 Program is guided by a Program Management Manual, a Quality Assurance Program, Project Unit Management Plans, Year 2000-specific procedures and applicable company-wide procedures
- Inventories were established early in the program and constitute a basis for the compliance activities
- Projects are all staffed and work is proceeding well, and in accordance with programme plans and procedures
- there is currently a strong focus on contingency planning
Year 2000 Program Status (cont’d)

- Priority definitions and schedules are based on corresponding Canadian nuclear regulatory priority categories (but power production impact and business impact, as well as safety impact, are taken into consideration).

- Y2k assessment and corrective action work on first and second priority items, (“Safety Systems” and “Safety Related Control Systems”) is complete.

- Work on “Indirectly Safety Related Systems” and “Business-Essential / Important” items is underway, with completion set for June 30, 1999.

- Other lower priority items are scheduled for September 30, 1999.

- Risk assessment and contingency planning activities are underway and provide further assurance of smooth Year 2000 transition.
AECL Y2K Program: Current Focus

- Completion of compliance analysis & remediation for the lower priority systems and products
- **Review of 3rd party**-designed systems with **embedded digital equipment** and
- **Risk management and contingency planning**

----The balance of this presentation deals with the latter two topics---
Conformity Assurance for 3rd party embedded systems

- AECL’s initial Year 2000 program focus was on AECL-designed systems and software for which AECL has primary responsibility for Y2K compliance assurance and remediation.
- “3rd party systems”, procured to AECL specifications, but designed and built by specialized equipment suppliers, are also used quite extensively, and can contain embedded digital components.
- The 3rd party suppliers have primary responsibility for compliance assurance and remediation of their products, but AECL review of 3rd party safety-related and production-related systems is also regarded as essential, and is being carried out under a systematic process.
Third Party systems review: main steps

- AECL review provide additional assurance that vendor compliance work has been properly executed and documented
  - AECL obtain Supplier certifications and supporting technical information
  - AECL system engineers, familiar with the systems, conduct formal documented review of supplier information
  - supplementary testing (typically at client site) and/or remedial measures (by the supplier) are launched where necessary.

- AECL review is concentrating on current build projects (e.g. Wolsong 2/3/4, MMIR) and in-house facilities, and is about 60% complete

- for older plants the primary Y2K compliance responsibility resides with the owners, but information is exchanged, and advisories issued by AECL where appropriate
Third Party systems review: findings to date

- very few dysfunctional systems have been found in our third party review work to date
- the majority of 3rd party systems are fully compliant or require at most operational instructions or warnings regarding system maintenance work (e.g. resetting the date once, on or soon after Jan. 01, 1999)
- in a few cases, system upgrades, and/or supplementary testing at site have been found necessary, and are being arranged
Year 2000 Risk Management and Contingency Planning: Context

- The first line of defense resides in the execution of normal Y2K assessment and remediation work.
- Risk reduction is assisted by the prioritization strategy which leaves considerable time between completion of the Y2K work and the beginning of the Year 2000, for systems of high importance.
- In addition, AECL are conducting a formal risk management / contingency planning process, based on our review of the approach taken by others in this area and on our own experience with risk assessment and abatement.
Year 2000 Risk Management and Contingency Planning: Overview

- In Consultation with Business Units, Y2K Project Leaders identify the risks (consequences, probability) of not achieving product/system Y2K readiness
- For items where risk is judged significant, detailed mitigation plans (launched immediately) or contingency plans (launched later if/when “triggers” materialize) are prepared
- the risk assessment and contingency planning work is spearheaded by Y2K project personnel (who are drawn from and knowledgeable in the respective technical domains), but:
- Steering Committee and Business Unit participation, and ownership of the risk assessments and contingency plans in their respective areas are key ingredients.
Y2K Risk Management Process
Simplified Block Diagram

1. Review Inventory
2. Identify & Characterize Risk in Tabular Form
3. Determine Impact H or M?
   - Yes: Accept
   - No: Proceed with Mitigate
4. Assess Probability H or M?
   - Yes: Mitigate
   - No: Proceed with Watch
5. Mitigate Action Class
   - A, W, M?
     - Yes: Mitigate
       - Accept
     - No: Watch
       - (depending on impact, probability, time frame)
6. Prepare Detailed Mitigation Plan
7. Prepare Detailed Contingency Plan
8. Incorporate Review Comments
9. Proceed with Plan & Monitor Progress
10. Incorporate Review Comments
Dependency Assessment

- Dependency risk assessment complements asset-based assessment
- internal and external dependencies are identified (e.g. on electricity supply, fuel, telephone system, computer networks, cell phones, ...)
- critical infrastructure elements are identified (e.g. class 3 power, water, steam, heat, HVAC, ...)
- impact of failure on the business of the site is assessed
- detailed contingency plans are developed for the critical areas.
Site Contingency Planning

Asset Base Supporting the Business

- Facilities
- Programs
- Buildings

SITE INFRASTRUCTURE
Power, Heat, Water, Telecommunications ..... 

- External Telephone System
- External Electricity Supply

Dependancies
Summary and Conclusions

- AECL has a comprehensive, well-advanced Year 2000 Program in place to assure year 2000 compliance of its systems and products.
- The main concentration of the AECL Program is on “build” projects, in-house systems and facilities, infrastructure systems, and recent retrofit products.
- Advisories and information bulletins are also issued for older plants and other customer (who have their own Y2K programs).
- AECL’s year 2000 compliance work on the higher priority systems and products is complete; work is proceeding to plan on the lower priority products.
- AECL are confident that CANDU reactors and other products will continue to operate safely and produce power reliably through the year 2000.