

AEC-CANDU OPERATIONS (Sales & Proposals) – Head Office in Mississauga, Ontario.

1982/1983 – Annual Budget – \$77M  
Gov't Appropriation – \$68M  
Commercial Revenues – \$9M

AEC-CANDU OPERATIONS (Finance, Commercial & Resources) – Head Office in Mississauga, Ontario.

**Capability:** WNRE is an Research & Development site. It performs fundamental and applied research, develops processes, products and components, and has a large staff of experienced people in most disciplines and trades. Our greatest asset is the ability to innovate, develop, test, commercialize and market a concept.

Keywords that describe their capability are as follows:

ASME Codes  
Biological Environment  
Chemical Analysis  
Chemical Processes  
Chemistry  
Colloidal Chemistry  
Combustion  
Computer Code Development  
Contract Research  
Corrosion  
Derived Release Limits  
Detonation  
Disposal  
Electrochemistry  
Electronics, Nuclear  
Environment  
Explosions  
Fluid Dynamics  
Fracture Mechanics  
Health Physics  
Hydraulics  
Instruments, Nuclear  
Irradiations  
Isotopes  
Materials Characterization  
Materials Testing & Development  
Mechanical Testing  
Medical Biophysics  
Metallography  
Metallurgical  
Mathematics  
Neutron Activation  
Non-destructive Testing  
Nuclear  
Nuclear Design  
Pathways Analysis  
Professional Services  
Physics  
Quality Assurance  
Rail Transport  
Reactors  
Radiation  
Radiation Shielding  
Radioactive Wastes  
Research & Development (R&D)  
Risk Analysis  
Safeguards  
Separation Processes  
Surface Chemistry  
Tailings  
Thermal Analysis  
Toxic Chemicals  
Trace Analysis  
Vitrification  
Waste Management

**Average Work Force:** Professional – 300  
Technical – 330  
Clerical – 175  
Prevailing Rate – 245

**Gross Sales:** 1981/1982 – Annual Budget – \$62M  
Gov't Appropriation – \$55M  
Commercial Revenues – \$7M

**Plant Size:** Approximately 10 major buildings which house R&D facilities – a research reactor (WR-1); engineering offices; machine, construction and maintenance work shops; administrative offices; protective services; fire department; and stores and warehousing. Very rough area of all facilities is 150,000m<sup>2</sup>.

**Equipment and Facilities:** WNRE's major research facility is the western world's only reactor using an organic fluid to remove heat from the core. The reactor (WR-1) moderated by heavy water, as are all Canadian reactors, went into operation in 1965 and has proven to be a versatile and effective tool for the testing and development of nuclear fuels and materials. It has shown the potential of the organic-cooled reactor as a source of large quantities of steam for industry. One application that is receiving increasing attention is the use of steam generated by the reactor to recover bitumen from deposits of oil sands. The WR-1 reactor has been used to heat buildings at WNRE for several years and additional surplus heat could be used for other purposes such as heating greenhouses and drying agricultural crops.

In addition to the WR-1 reactor with its facilities for irradiating and testing materials, WNRE has a variety of facilities and expertise available for undertaking commercial work, e.g.:

- Other irradiation devices – a gamma-irradiator, Van de Graaf and fast neutron generator.
- "Hot Cell" facilities capable of handling up to 10<sup>6</sup> Curies of radioactive material.
- Various test "loops" for materials, component and corrosion testing.
- Comprehensive metallurgical and mechanical testing facilities with expertise in testing ferrous and non-ferrous metals, ceramics, glasses, rocks and composites.
- Expertise in electron microscopy, acoustic emission, fracture mechanics, etc., that can be applied to solving problems involving deformation, hydrogen embrittlement, stress corrosion cracking, creep cracking and fracture.
- Extensive analytical chemistry facilities including micro-analytical, radiochemical, neutron activation, mass spectrometry, atomic absorption spectroscopy, plus a unique capability for the characterization of surfaces by such means as scanning electron microscopy, scanning auger microscopy, secondary ion mass spectrometry and photoelectron spectroscopy.
- A research chemistry group adept in the measurement of the thermodynamic properties of solutions at high temperature and pressure, in the application of electrochemical techniques to the study of corrosion and film formation, in the study of gas phase reactions, and in several areas of colloid and surface chemistry.
- Combustion test facilities to study the detailed deflagration and detonation behavior of mixtures of combustible gases from the fundamental chemistry of combustion to engineering scale verification or demonstration experiments.
- Environmental research laboratories and field test facilities with experienced staff to study the impact of chemical and radioactive effluents of the environment.