Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

Canadian Experience in Implementing Modern Regulations on Existing Research Reactors

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Canada

OUTLINE

- Canadian Nuclear Safety Commission
- Non-power reactors in Canada
- Modern regulatory regime
- Implementation challenges
- CNSC approach
- Conclusion

CANADIAN NUCLEAR SAFETY COMMISSION

- Nuclear regulatory body in Canada (previously AECB)

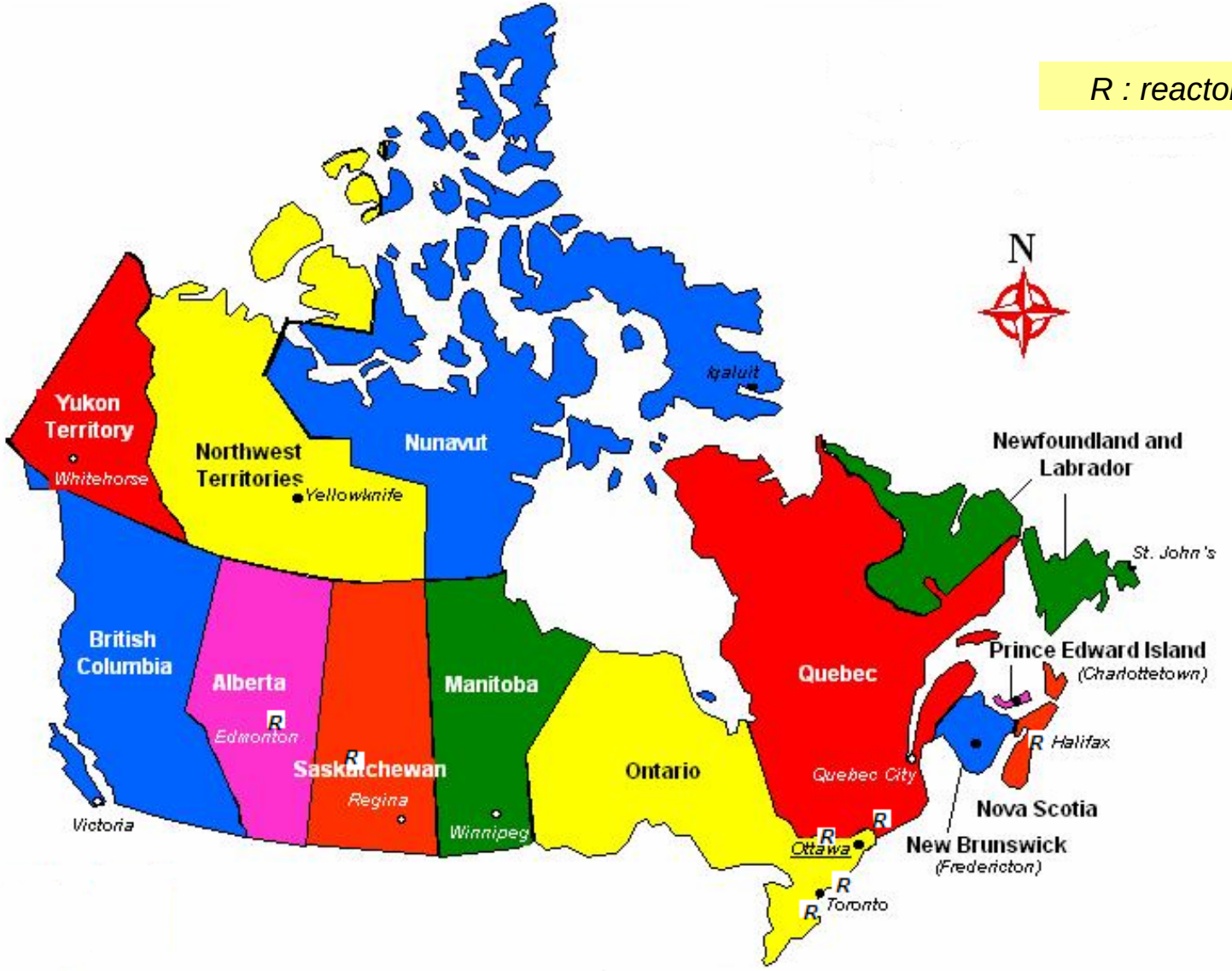
- CNSC (Commission)
  - Quasi-judicial tribunal
  - Decision-makers
  - Independent

- CNSC (Staff)
  - Technical support
  - Makes recommendations
  - Administers decisions

Non-Power Reactors in Canada	Power (kW th.)	Type	Status	Criticality
ZEEP	0.001	Heavy water	decommissioned	1945-09-01
NRX	42000	heavy water	shutdown	1947-07-22
PTR	0.1	pool	shutdown	1957-11-01
NRU	135000	heavy water	operating	1957-11-03
MNR	5000	pool	operating	1959-04-04
ZED-2	0.2	tank	operating	1960-09-01
WR-1	60000	heavy water	shutdown	1965-11-01
SLOWPOKE, Ottawa	20	SLOWPOKE	decommissioned	1971-05-14
SLOWPOKE, U of Toronto	20	SLOWPOKE-2	decommissioned	1971-06-05
SLOWPOKE, E. Polytechnique	20	SLOWPOKE-2	operating	1976-05-01
SLOWPOKE, Halifax	20	SLOWPOKE-2	operating	1976-07-08
SLOWPOKE, U of Alberta	20	SLOWPOKE-2	operating	1977-04-22
SLOWPOKE, SRC	20	SLOWPOKE-2	operating	1981-03-01
SLOWPOKE, Nordion, Kanata	20	SLOWPOKE-2	decommissioned	1984-06-06
SLOWPOKE, RMC	20	SLOWPOKE-2	operating	1985-09-06
SDR-SLOWPOKE Demo	2000	heating p. type	decommissioned	1987-07-15
MAPLE 1	10000	tank in pool	commissioning	2000-02-19
MAPLE 2	10000	tank in pool	commissioning	2003-10-09

OPERATING NON-POWER REACTORS

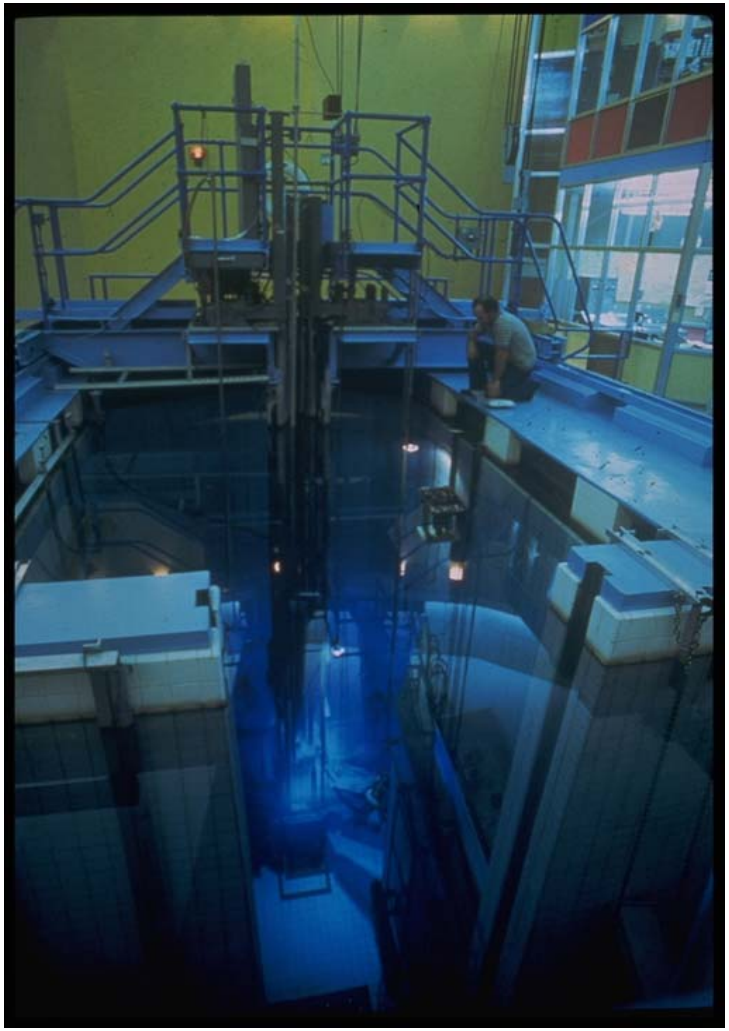
R : reactor site



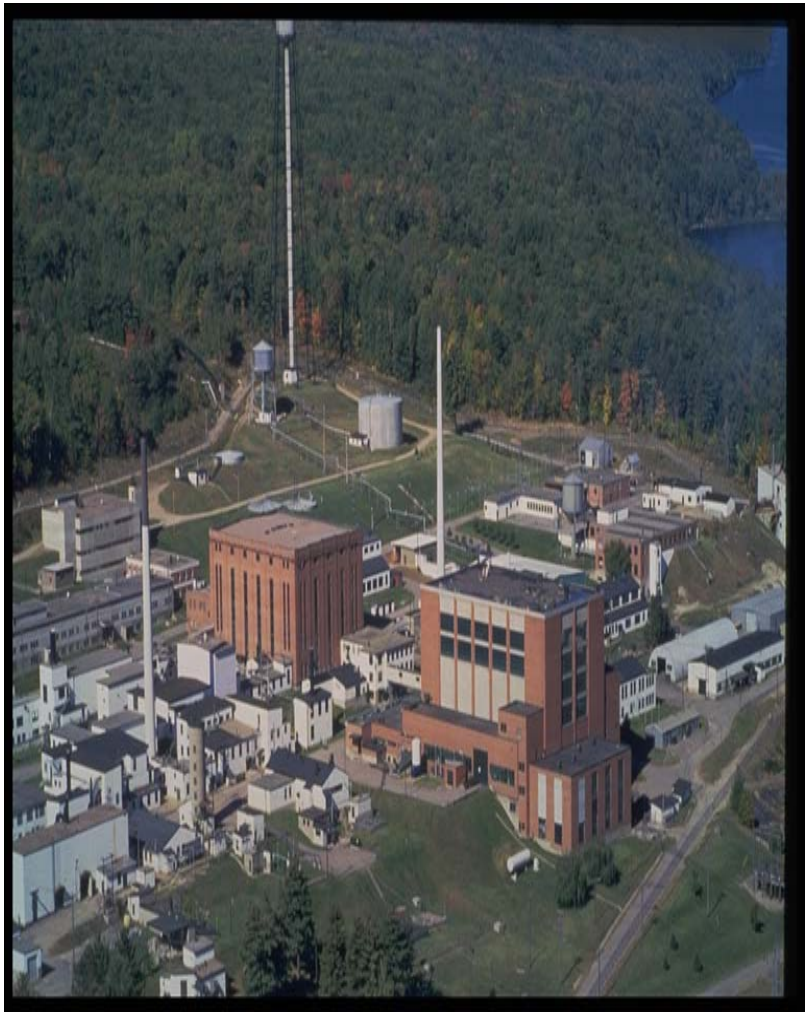
Canada

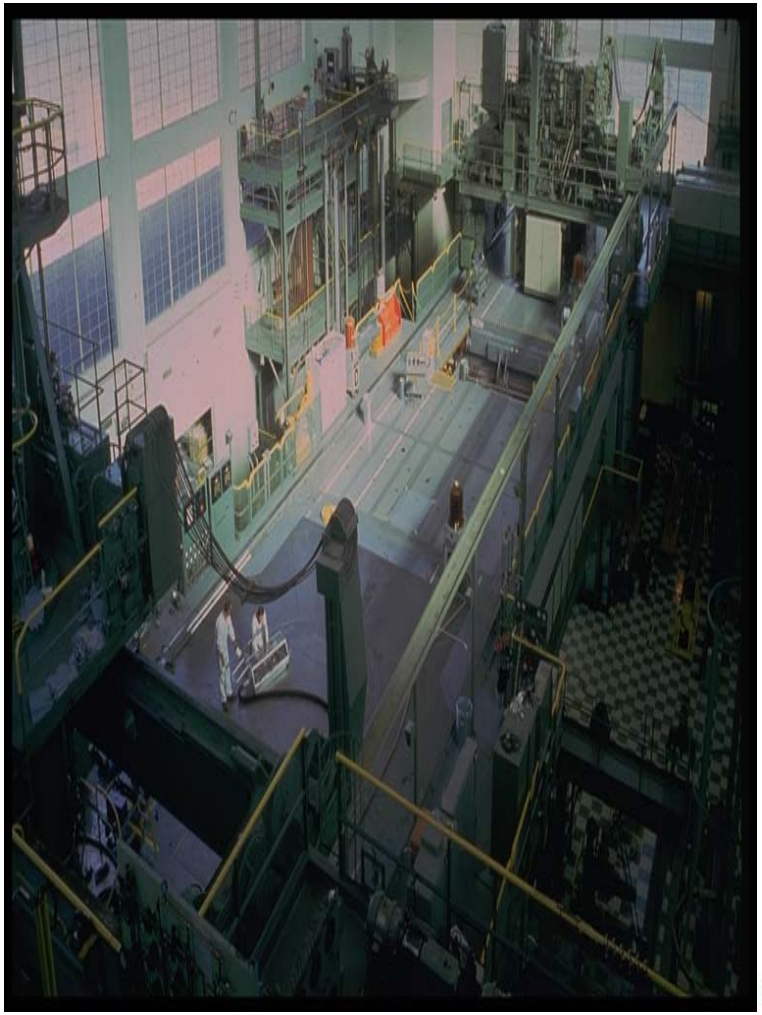
SLOWPOKE

MNR



NRU





NUCLEAR SAFETY AND CONTROL ACT

- Replaced the 50+ old Act
- Transparency – more public input
- More explicit and effective power and Regulations
- 13 Regulations for various classes of facilities
- Emphasis on environment and decommissioning
  - Link with CEAA
  - Financial guarantees for decommissioning

PROGRAM AREAS

- Quality management system required
- Organizational and management subject to oversight
- Training program with systematic approach
- Requirements for various programs (emergency response, criticality safety, fire protection)

IMPLEMENTATION ISSUES

- Requirements proportional to facility size
- Requirements specific to facility type
- Programs required in addition to compliance
- Requirements related to human performance

IMPLEMENTATION ISSUES (cont'd)

- All operating reactors licensed decades prior to new Act
- Safety cases need to be revisited
- Conventional safety
- Upgrade is the norm

CNSC APPROACH

- Risk based
  - Risk reduction proportional to effort and requirements
  - Risk ranking

- Time at risk
  - Transitional periods inversely proportional to risk
  - Implementation time frame reasonable

- Compliance promotion
  - Strong emphasis on communication

CONCLUSION

- Licensing regime evolved along with the new Act
- Several changes to the requirements and the process
- Both the operating research reactors' licensees and the regulator made particular efforts to bring the licensed activities up to the new standards