

NUCLEAR POWER PROGRAM

Table of Contents

SESSION 1 – Power Reactors

Chairman: D.A. Golden, Chairman of the Board,
Telesat Canada.

Historical Overview

L.G. McConnell, Vice-President, Power System Program, Ontario Hydro 3

Key Decisions

J.L. Gray, former President, Atomic Energy of Canada Ltd., (presented by D.A. Golden) 10

Significant Engineering Developments

G.A. Pon, Corporate Vice-President, Engineering, Atomic Energy of Canada Ltd. 17

SESSION 2 – Power Reactors

Chairman: J. Donnelly, President,
Atomic Energy of Canada Ltd.

Domestic Project Management

J. McCredie, Project Manager, Darlington Generating Station, Ontario Hydro. 25

Management of Foreign Projects

D.S. Lawson, President, Atomic Energy of Canada Ltd., CANDU Operations 36

Maintaining the Competitive Edge

G.L. Brooks, Vice-President and Chief Engineer, Atomic Energy of Canada Ltd., CANDU Operations 45

SESSION 3 – Safety and Regulation

Chairman: D.G. Hurst, President,
Atomic Energy Control Board, retired.

Nuclear Regulation

J.H. Jennekens, President, Atomic Energy Control Board 53

Engineering for Safety

W.G. Morison, Vice-President, Design & Construction, Ontario Hydro 58

A Risk Perspective

E.A. Siddall, Institute for Risk Research, University of Waterloo. 65

SESSION 4 – Unique Achievements

Chairman: S.R. Hatcher, President,
Atomic Energy of Canada Ltd., Research Company.

Fuel for Thought

J.A.L. Robertson, Director, Fuels and Materials Division,
Atomic Energy of Canada Ltd., Research Company, retired 77

The Control of Canadian Nuclear Reactors: An Account of Its Unique Features

A. Pearson, Director, Electronics, Instrumentation & Control Division,
Atomic Energy of Canada Ltd., Research Company, retired 86

Some Engineering Aspects in the Development of Pressure Tubes for CANDU

P.A. Ross-Ross, Head, Mechanical Equipment Development Branch,
Atomic Energy of Canada Ltd., Research Company, retired 92

SESSION 5 – Fuel Cycle

Chairman: J. Howieson, Advisor, Radioactive Waste Management,
Ministry of Energy, Mines and Resources.

Uranium Mining & Refining in Canada

A.W. Ashbrook, General Manager, Resources and Technology, Eldorado Resources Limited 107

Fuel Cycle Physics

E. Critoph, Vice-President, Strategic Technology Management,
Atomic Energy of Canada Ltd., Research Company 111

Safe, Permanent Disposal of Nuclear Fuel Waste

W.T. Hancox, Vice-President, Waste Management, Atomic Energy of Canada Ltd., Research Company 119

SESSION 6 – The Future

Chairman: Prof. W. Paskievici, Dean of Research & Graduate Studies, Ecole Polytechnique.

Small Canadian Reactors for Heat, Electricity, Research and Isotopes

R.E. Green, Vice-President, Reactor Development, Atomic Energy of Canada Ltd., Research Company 131

The Future of Nuclear Power – A Utility Perspective

S.G. Horton, Executive Vice-President, Human Resources, Engineering and Services, Ontario Hydro 139

Nuclear Power – Looking Ahead

A.J. Mooradian, Senior Vice-President, Atomic Energy of Canada Ltd. 145

FUSION PROGRAM

Table of Contents

SESSION 1 – Fusion – Canadian and Worldwide

Chairman: D.P. Jackson,
Atomic Energy of Canada Limited, Research Company.

Status of International Fusion Development

T.S. Brown, National Research Council of Canada 157

Le Tokamak de Varennes

R.A. Bolton, Institut de recherche d'Hydro-Québec 164

The Canadian Fusion Fuels Technology Project

D.P. Dautovich, P.J. Gierszewski, K.Y. Wong, R.R. Stasko, C.D. Burnham,
Canadian Fusion Fuels Technology Project 167

The Altech Project in Laser Fusion

A.A. Offenberger, University of Alberta/ALTECH 176

SESSION 2 – Fusion Engineering

Chairman: R.A. Bolton, Project Director,
Tokamak de Varennes, Institut de recherche d'Hydro-Québec.

Technical Overview and Electrical Design of the Tokamak de Varennes

G.W. Pacher*, R. Annamraju**, R.O. Butler**, Institut de recherche d'Hydro-Québec*, Canatom Inc.** . . . 185

Engineering Aspects of the Tokamak de Varennes Device

P.B. Cumyn, J. Rosen, Canatom Inc. 190

Data Acquisition and Control System of the Varennes Tokamak

J.M. Larsen*, C. Strong**, INRS – Energie*, MPB Technologies Inc.** 196

Remote Handling and Maintenance of Fusion Reactors

A.S. Jones, A.P. Higson, P.T.K. Fung, M. Elzeki, Spar Aerospace Limited 204

SESSION 3 – Fusion – An Alternative Energy Source

Chairman: D.P. Dautovich, Program Manager,
Canadian Fusion Fuels Technology Project.

Fusion Fuel Cleanup Systems

W.J. Holtslander, Atomic Energy of Canada Ltd., Research Company 215

Fusion Fuel Blanket Technology

I.J. Hastings*, P.J. Gierszewski**, Atomic Energy of Canada Ltd., Research Company*,
Canadian Fusion Fuels Technology Project** 218

Fusion Materials Issues

P.C. Stangeby*, A.A. Haasz**, University of Toronto*, Institute for Aerospace Studies** 228

Canadian Contributions to the Safety and Environmental Aspects of Fusion

R.R. Stasko, K.Y. Wong, Canadian Fusion Fuels Technology Project 240