

CANADIAN NUCLEAR SOCIETY

15TH ANNUAL NUCLEAR SIMULATION SYMPOSIUM
HOSTED BY ATOMIC ENERGY OF CANADA LIMITED
CANDU OPERATIONS
MISSISSAUGA, ONTARIO

1989 APRIL 30 - MAY 2

PROGRAM SCHEDULE

SUNDAY, APRIL 30

(Days Inn, 2125 North Sheridan Way, Mississauga, Ontario)

19:00 Registration
19:30 - 21:30 Wine and Cheese Reception

MONDAY, MAY 1

(Sheridan Park Conference Centre)

8:00 Welcoming Address: D.S. Lawson,
President, AECL CANDU Operations

8:10 - 10:10 Session 1: Thermohydraulics I
Chairman - M.B. Carver (AECL-CRNL)

"Natural Circulation Experiments in the RD-14 Multiple Channel Thermohydraulics Loop", by P.J. Ingham and J.P. Mallory, AECL-WNRE

"Comparison of FIREBIRD III and CATHENA Code Simulations of a 100 Percent Reactor Outlet Header Break", by J.N. Barkman, AECL-CO, D.J. Richards, AECL-WNRE, J.P. Mallory, AECL-WNRE, M.A. Wright, NBEPC, and H. Huynh, Hydro-Quebec.

"Small LOCA Analysis in Support of the Automatic PHTS Pump Trip Design for Point Lepreau NGS", by M.A. Wright, NBEPC and D.J. Edgar, Systec

"Analysis of Critical Inlet Header Break LOCA Experiments in the RD-14 Test Facility", by N.K. Popov and G.R. McGee, AECL-WNRE

"Enhanced Steam Pressure Control Routine for SOPHT-PA (Simulation of Primary Heat Transport - Pickering Nuclear Generating Station A)", by R.M. Sebastiano and N.A. Mitchell, Ontario Hydro

Session 1: Thermohydraulics I (Continued)

"Modelling of the High-Speed Hydraulic Injection Transient Found in the CANDU Liquid (Poison) Injection Shutdown System", by G. Schneider, H.G. Austman and W.I. Midvidy, Ontario Hydro

10:10 - 10:25 **Coffee**

10:25 - 12:10 **Session 2: Small Reactors**

Chairman - J.V. Donnelly (AECL - WNRE)

"SPORTS-M Prediction of the Transition from Forced to Natural Circulation in a MAPLE Reactor", by P.J. Mills and S.Y. Shim, AECL-WNRE

"Reactivity Calculations for the RMC LEU Fuelled SLOWPOKE-2 Reactor", by R.T. de Wit, H.W. Bonin, Royal Military College, Kingston, and B.M. Townes, AECL-CRNL

"Preliminary Thermohydraulics Analysis of the AMPS-1000 Reactor Core Using COBRA-IV", by A. Tahir, ECS-Power Systems Inc.

"Application of FLOW3D to Flow Modelling in Small Pool Natural-Circulation and Forced-Circulation Reactors", by S.J. Marshall, M.B. Carver, and P.W. Shipp, AECL-CRNL.

"The Analysis with Code TANK of a Postulated Reactivity-Insertion Transient in a 10-MW MAPLE Research Reactor", by R.J. Ellis, AECL-WNRE

12:10 - 13:15 **Lunch Period**

13:15 - 17:30 Parallel sessions

13:15 - 15:15 **Session 3: Thermohydraulics II**

Chairman - J.M. Hopwood (AECL-CO)

"An Empirical Correlation For D₂O Two-Phase Critical Flow Prediction of the Henry-Fauske Model", by M-R. Lin, AECL-CO and M.A. Wright, NBEPC

"Analysis of Countercurrent Flooding Data Obtained in Vertical-to-Inclined Pipes Containing Elbows of Varying Angle", by M. Kawaji, University of Toronto, L.A. Thomson, AECL-CO and V.S. Krishnan, AECL-WNRE

Session 3: Thermohydraulics II (Continued)

"Applicability of the Homogeneous Equilibrium Model (HEM) In Horizontal Pipe, Annulus and Rod Bundle Flows", by S.I. Osamusali, and J.-S. Chang, McMaster University, D.C. Groeneveld, AECL-CRNL, and S.C. Cheng, University of Ottawa

"Improvement and Testing of a CANDU Pressurizer Dynamics Simulation", by J.S. Pitre and D.A. Meneley, University of New Brunswick

"Real-Time Simulation of PHT Pump Low-Speed Drives for the Bruce NGS-B Training Simulator", by F. Capogreco, Ontario Hydro

"Verification of the TUF Code Against the JUICE 1976 Standard Problems", by A. Tomasone, W. Liu and J.C. Luxat, Ontario Hydro

13:15 - 15:15

Session 4: Physics I

Chairman - A. Baudouin (Hydro-Quebec)

"Obtaining POWDERPUFS Cell Cross Sections from WIMS", by M. Gold, Ontario Hydro

"Calculation of Device Static Reactivity Worth by Modal Analysis", by M. Gold, M.Z. Farooqui and N. Roy, Ontario Hydro

"Reactivity Transient Due to Malfunction of a Mechanical Zone Controller in the CANDU-3 Reactor", by V.K. Mohindra, AECL-CO

"A Space-Time Reactor Simulation", by G. Gaboury and W.J. Garland, McMaster University

"The Comparison of Calculated and Experimental Values of Fine-Structure Reaction Rates in CANDU-Type Lattices Containing (U²³³,Th)O₂ Fuel", by M.B. Zeller, R.T. Jones and A. Celli, AECL-CRNL

"A Method for Calculation of Incremental Cross Sections for Rod-and-Tube Type Adjusters", by S.D. Arguner and A.U. Rehman, Ontario Hydro

15:15 - 15:30

Coffee

15:30 - 17:30

Session 5: Modelling and Methods

Chairman - D. Rozon (Ecole Polytechnique)

"A Fully Implicit, Back-Substituted Algorithm for Thermalhydraulic Networks", by R.J. Wilson, EACS Inc., and W.J. Garland, McMaster University

"Real-Time Simulation of CANDU Heat-Transport System", by J.D. Hoskins and W.J. Garland, McMaster University

"An Iterative Method to Solve Large Sparse Linear Systems", by S.R. Vatsya, AECL-WNRE

"Parity Simulation Applied to Reactor Physics Nodal Theory Transient Analysis", by P.J. Laughton, AECL-CRNL

"Calculating Array Criticality Using Thomas's Limiting Surface Density Model", by J.W. Thompson, AECL-CRNL

"An Analytical Solution to the Equations for Long-Term Transport and Release of Fission Products", by K.R. Weaver, Shaftesbury Scientific Limited

15:30 - 17:30

Session 6: Thermohydraulics III

Chairman - W.I. Midvidy (Ontario Hydro)

"Recent Simulations of the Distribution of Flow and Temperature in Horizontal Bundles Using ASSERT-4", by M.B. Carver, J.C. Kiteley and R.J. Morris, AECL-CRNL

"CATHENA Prediction of MAPLE-X10 Performance During a Complete Pipe Severance", by T.E. MacDonald and S.Y. Shim, AECL-WNRE

"Investigation of Refilling Behaviour of a Simulated CANDU Feeder Pipe", by R. Thuraisingham and M. Kawaji, University of Toronto and J.C. Luxat, Ontario Hydro

Session 6: Thermohydraulics III (Continued)

"MAPL3D Predictions of Three-Dimensional Flow Fields in a One-Fifth Scale Hydraulic Test Facility", by D.K. Baxter and S.Y. Shim, AECL-WNRE

"A Model for Two-Phase Redistribution in Dividing Two-Phase Flow", by J.D. Ballyk and M. Shoukri, McMaster University

17:45 - 18:45 Cash Bar

18:45 Symposium Banquet

Guest Speaker: Dr. L. Yaffe, Professor Emeritus, McGill University, on "Canada's Early Participation in Atomic Energy"

TUESDAY, MAY 2

(Sheridan Park Conference Centre)

8:10 - 10:10 Session 7: Physics II
Chairman - A.R. Dastur (AECL-CO)

"Power Transient Following a Loss of Low Pressure Service Water Open System in Darlington NGS A", by N. Roy, M.B. Gold and K.K. Fung, Ontario Hydro

"The Effect of Loss of Regulation on the Severity of the Loss-of-Coolant Accident in the CANDU 6", by M.H. Younis, S. Prawirosoehardjo, R. Calabrese, and A.R. Dastur, AECL-CO

"RFSP Simulation of a Reactor-History Slice Featuring Saturated Zone-Control Compartments", by M.A. Dencer and B. Rouben, AECL-CO and E. Young, NBEPC

"CANDU 600 Reactor Response to Localized Perturbations Such as Channel Fuelling", by E. Young, R. Sancton, and M. El-Hawary, NBEPC, and R. Robinson, Atlantic Nuclear Services

"Reactor Physics Simulation of Fast Reactivity Transients in the Nuclear Battery", by J.V. Donnelly, AECL-WNRE

Session 7: Physics II (Continued)

"SIMEX-77: A FORTRAN-77 Fuel Burnup History and Refuelling Simulation Program for Core Fuel Management at the Gentilly-2 Nuclear Generating Station", by G. Hotte, M. Beaudet, J. Koclas, and G. Pepin, Hydro-Quebec

10:10 - 10:35 **Coffee**

10:35 - 12:10 **Session 8: There's More Than P and T**
Chairman - A.L. Wight (Ontario Hydro)

"Application of a Monte-Carlo Simulation Code for the Research and Development of Self-Powered Flux Detectors", by T.C. Leung, R.J. Morris and S.J. Han, AECL-CRNL

"PRESCON2 Simulation of the OECD/CSNI Containment International Standard Problem #23", by W.M. Collins, AECL-CO and R.A. Gibb, NBEPC

"Assessment of FFTF/MOTA and Thermal Reactor Irradiation Facilities for Advanced Tritium-Breeder-Material Tests", by R.E. Donders, AECL-CRNL

"An Overview of Ontario Hydro's Nuclear Risk Assessment Program", by V.M. Raina, Ontario Hydro

"Real-Time Simulation of Electrical Distribution Systems", by A. Abramovitch and N. Kratsios, CAE Electronics Ltd.

12:10 - 13:15 **Lunch Period**

13:15 - 14:35 **Session 9: Fuel and Thermohydraulics I**
Chairman - V.S. Krishnan (AECL-WNRE)

"CIRENE Fuel Bundle Integrity Following a Feeder Break", by P.N. Singh, R. Sejnoha, M. Tayal, AECL-CO and G. Valli, ENEA

"Transient Thermal Analysis of an Idealized Fuel Element", by G.R. McGee and J.W. DeVaal, AECL-WNRE

"An Improved Model for the Release of Fission Gas in CANDU Fuel", by M. Tayal and A. Ranger, AECL-CO

Session 9: Fuel and Thermohydraulics I (Continued)

"Influence of Pellet Shapes on Sheath Strains: ELESTRES Predictions vs Irradiation Measurements", by N.C. Singhal, M. Tayal, and T.J. Carter, AECL-CO

14:35 - 14:50 **Coffee**

14:50 - 16:10 **Session 10: Fuel and Thermohydraulics II**
Chairman - E. Kohn (AECL-CO)

"Heat Flux Distribution on a Finned Fuel Pin", by J.E. Kowalski, AECL-WNRE, I.C. Lim, Korea Advanced Energy Research Institute, and S.Y. Shim, P.J. Mills, AECL-WNRE

"Simulation of a Closed Two-Phase Thermosiphon with the CATHENA Code", by B.N. Hanna and B.G. Taylor, AECL-WNRE

"A Method of Predicting CHF in Interconnected Subchannels", by C.W. Snoek, AECL-CRNL

"Two-Phase Pressure Drop Across Flow Obstructions", by S.C. Sutradhar, AECL-CRNL

