DENNIS M. LeNEVEU M. Sc.

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PROFILE

Innovative Computational Scientist, Educator and Environmental Consultant with fortyone years experience in environmental protection, radiation and industrial safety, software
development and education. Skilled at working with a team of professional analysts,
managers, software developers and scientists to produce state-of-the-art simulation
systems and technical documents. Experienced in numerical analysis, education, scientific
documentation, software quality assurance, risk assessment and environmental
assessment. Demonstrated ability in developing and delivering educational and safety
training programs. Holder of a valid Manitoba teaching certificate.

CAREER EXPERIENCE

2018-2019 – PARTICIPATED IN THE PUBLIC REVIEW OF THE WANIPIGOW SAND EXTRACTION PROJECT

• submitted technical documents to Manitoba Sustainable Development on environmental aspects of the Project including GHG implications

2017-2018 – EXPERT FOR THE INTERVENTION BY COUNCIL OF CANADIANS WINNIPEG CHAPTER FOR MANITOBA HYDRO THE MMTP PROJECT

• submitted evidence to the NEB concerning the climate change implications of the Project with respect to Manitoba transition away from fossil fuels

2016 – 2017 – INTERVENOR FOR THE ENERGY EAST PIPELINE PROJECT

• Researched issues and prepared letters and motions submitted to the NEB

1998 - present LENEVEU SIMULATIONS INC.

<u>Director</u> 1998-present

- Incorporated employee owned company specializing in nuclear fuel waste management consulting
- Expert for the Manitoba Hydro MMTP
- On contract as a software consultant for the South West Research Institute in San Antonio Texas supporting the Total Performance Assessment Code for nuclear fuel waste disposal at Yucca Mountain

- Produced an environmental assessment of the in-situ disposal of decommissioning wastes from a demonstration reactor (NPD) that operated for 25 years on the Ottawa River
- Developed the three dimensional radionuclide and contaminant transport code, BETRAC under contract with AECL of Canada for Ontario Hydro Power Generation
- Developed software for the prediction of safe levels of manure deposition on agricultural fields
- Developed a spreadsheet application (CQUESTRA) for the probabilistic risk assessment of the sequestration of carbon dioxide in abandoned oil reservoirs for the International Energy Agency Green House Gas Weyburn CO₂ Monitoring and Storage Project
- Published papers on the leakage of acid gas from underground disposal sites
- Provided expert advice to support the intervention of the St. Norbert Arts Centre for the Energy East Pipeline Project

2002 – 2012 LOCAL HIGH SCHOOLS and STONEY MOUNTAIN CORRECTIONAL INSTUTUTE

<u>Teacher</u> 2002-2012

• Substitute teaching

1977-1998 ATOMIC ENERGY OF CANADA LIMITED, PINAWA, MANITOBA

Research Analyst 1981-1998

- Created the computer models for the movement of radionuclides from an underground disposal vault that formed the basis for the environmental impact statement for the disposal of Canada's nuclear fuel waste
- Developed novel computational methods for simulating physical systems using a combination of boundary element and Laplace transform techniques that far exceed existing methods in accuracy and computational efficiency
- Managed a \$300,000 project to develop modeling methodology used for design optimization and risk assessment of disposal vaults containing Ontario Hydro's nuclear fuel waste
- Developed computer codes, performed assessments, developed project specifications and cost analysis for multi-million dollar projects on the movement of radionuclides from disposal facilities for low and intermediate level waste from Ontario Hydro, Chalk River Nuclear Laboratories, New York State and Scotland
- Prepared and presented, with fellow team members, courses on the computer modeling and risk assessment of nuclear fuel waste disposal for the national programs of Spain and Sweden, and for Ontario Hydro.

- Produced graphics and technical briefs to support the disposal concept of Canada's nuclear fuel waste at the Canadian Environmental Assessment Hearings on high level nuclear fuel waste disposal that contributed to a positive judgment on the technical feasibility of the concept
- Produced an automated method for generating self-consistent quality assurance documentation of computer codes and performed compliance testing of code modules, designed to conform to the N286.7 CSA draft standard on quality assurance of computer software
- Authored over 50 technical papers and reports some on which provided essential documentation to support the concept of underground disposal of Canada's nuclear fuel waste

Radiation and Industrial Safety Officer

1977-1981

- Developed and managed industrial and radiation safety loss management and programs and emergency evacuation plans for Whiteshell Nuclear Laboratories
- Developed and presented radiation, industrial and laboratory safety courses
- Performed fault tree analysis of accident scenarios and industrial procedures to reduce work place accidents and equipment down time
- conducted safety audits of laboratories and industrial workplaces, investigated accidents and formulated policies and procedures to reduce workplace accidents

1976-1977 CROSS LAKE SCHOOL, CROSS LAKE MANITOBA

• taught primary school in a cross cultural setting

1974-1976 MARY KNOLL SCHOOL, OKUKU NIGERIA

- taught high school mathematics and physics under the auspices of the Canadian University Service Overseas
- coached school track team that competed on a state and interstate level

EDUCATION

- 1973 M.Sc. in Biophysics from Brock University, Ontario
- 1970 B.Sc. (Hons.) in Physics from the University of Manitoba
- 1974 B.Ed. (Education) from Queens University, Ontario
- 2003 completed JAVA Level 1 and VB.Net Levels 1-5 for the Certificate in Computer Programming at the University of Winnipeg

SELECTED PUBLICATIONS

• over 60 publications. See appendix A.

INTERESTS

Cross Country Skiing and Canoeing

- President Whiteshell Cross Country Ski Club 1982-83
- coached junior skiers
- won medals in cross country skiing in the Manitoba winter games 1982 gold, 1990 gold, 1994 gold, 2002 silver and bronze
- won medals at the national marathon canoe championships 2001-2014

Kayaking, canoeing, camping, website development, computer programming

APPENDIX A

Reports and Publications

- 1) **LeNeveu**, **D.M.**, R.P. Rand, D. Gingell, V.A. Parsegian. Apparent Modification of Forces between Lecithin Bilayers. Science, Volume 191 pages 399-400, Jan. 1976
- 2) **LeNeveu**, **D.M.**, R.P. Rand and V.A. Parsegian. Measurement of Forces between Lecithin Bilayers Nature. Volume 259, No. 5544, pp. 601-603, Feb. 1976
- 3) Hawkins, R.J., **D.M. LeNeveu** and J.L. Weeks. A Guide to the Safe Handling of Non-Radioactive Chemical Carcinogens in the Laboratory Atomic Energy of Canada Limited Report. WNRE-00342, October 1980.
- 4) **LeNeveu**, **D.M.** Health and Safety at the Whiteshell Nuclear Research Establishment. Atomic Energy of Canada Limited Report, AECL-6828, January 1982.
- 5) LeNeveu, D.M. and E.J.K. Cowdrey. WNRE Introductory Safety Guide. WNRE-522, May 1982.
- 6) Goodwin, B.W., N.C. Garisto, W.F. Heinrich, K.K. Mehta, D.M. LeNeveu and J.R. Walker. SYVAC Development. In Proceedings of the 16th Management Information Meeting of the Canadian Nuclear Fuel Waste Management Program. Toronto, 26 September 1983. Atomic Energy of Canada Limited Technical Record, TR-218, 1983.
- Oscarson, D.W., R.L. Watson and D.M. LeNeveu. A Compilation of Distribution Coefficients for Radioactive and Other Toxic Contaminants with Bentonite for Use in SYVAC.. Atomic Energy of Canada Limited Technical Record, TR-288, October 1984.
- 8) **LeNeveu, D.M.** The Vault Submodel for SYVAC3. In Proceedings of the 20th Information Meeting of the Nuclear Fuel Waste Management Program. Atomic Energy of Canada Technical Record, TR-375, Pinawa, Manitoba, 1985.
- 9) Wuschke, D.M., P.A. Gillespie, K.K. Mehta, W.F. Heinrich, **D.M. LeNeveu**, V.M.M. Guvanasen, G.R. Sherman, D.C. Donahue, B.W.Goodwin, T.H. Andres and R.B. Lyon. Second Interim Assessment of the Canadian Concept for Nuclear Fuel Waste Disposal, Volume 4:Post-Closure Assessment. Atomic Energy of Canada Limited Report, AECL-8373-4, 1985.
- LeNeveu, D.M. Modelling of Container Failure Rate for SYVAC2. In The Corrosion Performance of Nuclear Fuel Waste Containers edited by K. Nuttall, P. McKay. Atomic Energy of Canada Limited Technical Record, TR-340, 1985.
- 11) **LeNeveu, D.M.** The Vault Submodel for the Canadian Concept for Nuclear Fuel Waste Disposal as Applied to the Performance of Engineered Barriers. In Proceedings of the 19th Information Meeting of the Canadian Nuclear Fuel Waste Management Program. Toronto Convention Centre, 1985.
- 12) **LeNeveu, D.M.** and J.R. Walker. The Vault Submodel for the Interim Assessment of the Canadian Concept for Nuclear Fuel Waste Disposal. In Proceedings of ANS Topical Meeting on High Level Nuclear Waste Disposal. Pasco, Washington, September 1985
- 13) **LeNeveu, D.M.** The Vault Submodel for SYVAC3. In Proceedings of the 20th Information Meeting of the Canadian Nuclear Fuel Waste Management Program. Winnipeg, Manitoba. Atomic Energy of Canada Limited Technical Record, TR-375, 1985.
- 14) LeNeveu, D.M. Vault Submodel for the Second Interim Assessment of the Canadian Concept for Nuclear Waste Disposal: Post-Closure Phase. Atomic Energy of Canada Limited Report, AECL-8383, February 1986.
- 15) Johnson, L.H. and D.M. LeNeveu. Reducing Radiation Doses from 129I Disposal by Isoptopic Dilution. In Proc. Second Int. Conf. Radioactive Waste Management. Winnipeg, Mainitoba, Sept. 7-11, 1986
- 16) Walker, J.R. and **D.M. LeNeveu.** Methods of Incorporating Non-Linear Chemical Adsorption Isotherms in the Assessment of Nuclear Fuel Waste Disposal. Atomic Energy of Canada limited Report, AECL-8374, in preparation, 1986.
- 17) Walker, J.R. and **D.M. LeNeveu.** Nonlinear Chemical Sorption Isotherms in the Assessment of Nuclear Fuel Waste Disposal. Atomic Energy of Canada Limited Report, AECL-8394, 1987.

- 18) **LeNeveu, D.M.** Response Function of the Convection-Dispersion Equations Describing Radionuclide Migration in a Finite Medium. Atomic Energy of Canada Limited Report, AECL-9166, 1987.
- 19) Goodwin, B.W., T.H. Andres, P.A. Davis, **D.M. LeNeveu**, T.W. Melnyk, G.R. Sherman and D.M. Wuschke, Post-Closure Environmental Assessment for the Canadian Fuel Waste Management Program. Radioactive Waste Management and the Nuclear Fuel Cycle. 8, 241-272, 1987.
- 20) **LeNeveu, D.M.** Response Function of the Convection-Dispersion Equations Describing Radionuclide Migration in a Finite Medium. Ann. Nucl. Energy, 14(2) 77-B2, 1987.
- 21) Garisto, N.C., and D.M. LeNeveu. A Vault Model for the Assessment of Used Fuel Disposal in Canada. In Proceedings of the 1987 Fall Meeting of the Materials Research Society, Boston, Massachusetts, November 30, 1987
- 22) LeNeveu, D.M. and N.C. Garisto. Sensitivity Surfaces for the Assessment of Waste Package Performance. In Proceedings of the 1987 Fall Meeting of the Materials Research Society, Boston Massachusetts, November 30, 1987
- 23) Apted, M.J., D.W. Engel, N.C. Garisto and **D.M. LeNeveu.**. Source-Term Comparison Using the AREST and SYVAC-Vault models: Effects of decay-Chain IN-Growth and Precipitation. Mater. Res. Soc. Symp. Proc. 127 (Scientific Basis for Waste Management XII) pp. 597-604. 1989
- 24) Engel, D.W., M.J. Apted, N.C. Garisto and **D.M. LeNeveu**,. Comparison of Source Term Calculations Using the AREST and the SYVAC Vault Models, Rad. Waste Management and the Nucl. Fuel Cycle Vol 13 (1-4) pp. 281-296, 1989
- 25) Garisto, N.C., and D.M. LeNeveu. The Vault Model for the Disposal of used CANDU Fuel: Documentation and Analysis of Scoping Calculations. Atomic Energy of Canada Limited Report, AECL-9578, 1989
- 26) Garisto, N.C. and **D.M. LeNeveu.** Analysis of Mass Transport in an Engineered Barriers System for the Disposal of Used Nuclear Fuel. Mater. Res. Soc. Symp. Proc. <u>176</u> (Scientific Basis for Nuclear Waste Management XIII), pp.775-783 1990
- 27) Garisto, N.C. and **D.M. LeNeveu.** The Mass Transport of Radionuclides in Multilayered Media", Atomic Energy of Canada Limited Report, AECL-10384,1992
- 28) King, F., **D. LeNeveu**, S. Ryan and C. Litke. Predicting the Long-Term Corrosion Behaviour of Copper Nuclear Fuel Waste Container. In Life Predictions of Corrodible Structures, Cambridge, Sept 1991 (NACE Houston)
- 29) Ikeda, B.M., M.G. Bailey, M.J., Quinn, **D.M. LeNeveu** and D.W.Shoesmith. Predicting Lifetimes of Titianium Nuclear Waste Containers. Presented at Western Region NACE meeting, Feb. 1991
- 30) **LeNeveu, D.M.** Model Sensitivity Analysis in Near-field Performance Assessment" in Proceedings of the Third International High Level Waste Management Conference in Las Vegas. Apr. 1992
- 31) Garisto, N.C. and **D.M. LeNeveu**. A Radionuclide Mass-Transpot Model for the Performance Assessment of Engineered Barriers in a used Nuclear Fuel Disposal Vault. Atomic Energy of Canada Limited Report, AECL-10277, 1991
- 32) Johnson, L.H. and **D.M. LeNeveu.** Performance Assessment of Engineered Barriers Using the Vault Model. Mat. Res. Soc. Symp. Proc. Vol. 294, Materials Research Society, 1993
- 33) Johnson, L.H. and **D.M. LeNeveu,**. Analysis of the release of radionuclides from a prematurely defected container during preclosure period for a nuclear waste disposal vault. Atomic Enegry of Canada Limited Technical Record, Tr-520, Pinawa, Manitoba
- 34) Shoesmith, D., B. Ikeda and **D. LeNeveu.** Lifetime Predictions for Titanium Nuclear Waste Containers", presented at Proceedings of a Conference on Life Predictions of Corrodable Structures, Cambridge England, Sept 23-26,1991, Houston Texas, organized by National Association of Corrosion Engineers, NACE International, In: Life Prediction of Corrodable Structures Edited by R.N. Parkins 1994
- 35) King, F., **D.M. LeNeveu** and D.J. Jobe. Modelling the Effects of Evolving Redox conditins on the Corrosion of Copper Containers. In Scientific Basis for Nuclear Waste Management XVII Materials Research Soc. Symposium Proceedings. A. Barkatt and R.A. Konyrenburg (eds) Boston 29-November-3-December 1993 (Materials Research Society, Pittsburgh PA) published in Mat. Res. Soc. Symp. Proc. Vol. 333, Materials Research Society, 1994

- 36) Goodwin, B.W., W.C. Hajas, **D.M. LeNeveu** and T.W. Melnyk. Post Closure Assessment as a Design Tool for Waste Disposal Systems, 2nd International Workshop on Design and Construction of Final Repositories. Winnipeg, February 15-17, 1994
- 37) **LeNeveu, D.M.** and P.A. O'Connor. Numerical Inversion of Laplace Transforms Applied to the Boundary Integral Method. In Proceedings of the Annual Symposium on Mathematical Sciences. Deep River, Ontario, February 11 and 12, 1994
- 38) Kolar, M. and **D.M. LeNeveu.** Near-Field Transport of 129I from a Point Source in an In-Room Disposal Vault, Materials Research Society. XVIII International Symposium for the Scientific Basis for Nuclear Waste Management. Kyoto, Japan, 1994
- 39) Johnson, L.H., **D.M. LeNeveu**, D.W. Shoesmith, D.W. Oscarson, M.N.Gray, R.J. Lemire, N.C. Garisto, The Disposal of Canada's Nuclear Fuel Waste: The Vault Model for Postclosure Assessment. Atomic Energy of Canada Limited Report, AECL-10714, COG-93-4, 1994
- 40) Goodwin, B.W., D.B. McConnell, T.H. Andres, W.C. Hajas, D.M. LeNeveu, T.W. Melnyk, G.R. Sherman, M.E. Stephens, J.G. Szekely, P.C. Bera, C.M. Cosgrove, K.D. Dougan, S.B. Keeling, C.I. Kitson, B.C. Kummen, S.E. Oliver, K. Witzke, L. Wojciechowski, A.G. Wikjord. The Disposal of Canada's Nuclear Fuel Waste: Post Closure Assessment of a Reference System. Atomic Energy of Canada Limited Report, AECL-10717, COG-93-7, 1994
- 41) **LeNeveu D.M.** Analysis Specifications for the CC3 Vault Model. Atomic Energy of Canada Limited Report, AECL-10970, COG-94-100, 1994
- 42) Kolar, M. and D.M. LeNeveu. Near-Field Mass Transport from a Point Source (Instantaneously Failed Container) Located in a Disposal Room. Atomic Energy of Canada Limited Report, AECL-1172, COG-I-94-444, 1995
- 43) Sheppard, S.C., Hajas, W.C., Kitson, C.I., **LeNeveu, D.M.**, Melnyk, T.W. Ramsay, J.R., Russel, S.B., Torok, J. Witzke, K.H. and Wuschke, D.M. Preliminary Assessment of Low-and Intermediate_Level Waste Disposal in the Michigan Basin Performance Assessment, SYVAC Simulations, Protected-COG R&D Report COG-95-368, 1995
- 44) King,F., C.D. Litke, M.J. Quinn and **D.M. LeNeveu.** The Measurement and Prediction of the Corrosion Potential of Copper in Chloride Solutions as a Function of Oxygen Concentration and Mass-Transfer Coefficient. Corrosion Science, Vol.37 No.5, pp. 833-851, 1995
- 45) C.I. Kitson, D.M. LeNeveu, L.C. Wojciechowski, S.E. Oliver, G.R. Sherman, and S.C. McAuley. 1995. Function Testing – A component of Verification of Scientific Modelling Software. Proceedings of the 1995 Summer Computer Simulation Conference (sponsored by the Society for Computer Simulation), Ottawa, Ontario, July 23-25 1995
- 46) Goodwin, B.W., W.C. Hajas and D.M. LeNeveu. A scoping comparison of the effect of in-room and borehole emplacement on the long-term performance of a deep geological disposal system. Atomic Energy of Canada Limited Technical Record, AECL-TR-736, COG-96-30, 1996
- 47) Goodwin, B.W., W.C. Hajas and **D.M. LeNeveu.** Effect of Long-lived Containers on the Postclosure Performance of a Reference Disposal System. Atomic Energy of Canada Limited Report, AECL-11461, COG-95-497, 1996
- 48) Shoesmith, D., Ikeda, B. and **LeNeveu**, **D.** Modelling the failure of Nuclear waste containers, paper 369, CORROSION 96 NACE International HOUSTON, 1996
- 49) Shoesmith, D.W., B.M. Ikeda and D.M. LeNeveu. Modelling the Failure of Nuclear Waste Containers, Computer in Corrosion Control. Modelling and Information Processing. Denver, Colorado, March, 1996
- 50) LeNeveu, D.M. and M. Kolar, M. Radionuclide Response Functions for the Convection-Dispersion Equation from a Point Source along the Axis of Nested Cylindrical Media. AECL-11549, COG-96-90, 1996
- 51) Johnson, L.H., D.M. LeNeveu, F. King, D.W. Shoesmith, M.Kolar, D.W. Oscarson, S. Sunder, C. Onofrei, J.L. Crosthwaite. The Disposal of Canada's Nuclear Fuel Waste: A Study of Postclosure Safety of In-Room Emplacement of Used CANDU Fuel in Copper Containers in Permeable Plutonic Rock Volume 2: Vault Model, Atomic Energy of Canada Limited Report, AECL-1194-2, COG-95-552-2, 1996

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- 52) Goodwin, B.W., T.H. Andres, W.C. Hajas, D.M. LeNeveu, T.W. Melnyk, J.G. Szekely, A.G. Wikjord, D.C. Donahue, S.B. Keeling, C.I. Kitson, S.E. Oliver, K. Witzke L. Wojciechowski. The Disposal of Canada's Nuclear Fuel Waste: A Study of Postclosure Safety of In-Room Emplacement of Used CANDU Fuel in Copper Containers in Permeable Plutonic Rock Volume 5: Radiological Assessment. Atomic Energy of Canada Limited Report, AECL-1194-5, COG-95-552-5, 1996
- 53) LeNeveu, D.M. Radionuclide Mass Transfer Rates from a Pinhole in a Waste Container for an Inventory-Limited and a Constant Concentration Source, Atomic Energy of Canada Limited Report, AECL-11540, COG-96-68, 1996
- 54) Shoesmith, D.W., B.M. Ikeda, **D.M. LeNeveu.** Modelling the Failure of Nuclear Waste Containers, The Journal of Science and Engineering Corrosion, Vol. 53, No. 10, p.820, 829, October 1997
- 55) Sheppard, S.C., W.C. Hajas, C.I. Kitson, D.M. LeNeveu, T.W. Melnyk, K.H. Witzke, L.C. Wojciechowski, D.M. Wuschke. Second Assessment of Low-and Intermediate-Level Waste Disposal in the Michigan Basin, Protected -COG, R&D report, COG-97-193, 1997
- 56) Sunder, S., D.W. Shoesmith, M. Kolar, D.M. LeNeveu, Calculation of used nuclear fuel dissolution rates under anticipated Canadian waste vault conditions, Journal of Nuclear materials, Vol. 250, p. 118-130, 1997
- 57) Szekely, J.G., D.C. Donahue, W.C. Hajas, C.I. Kitson, D.M. LeNeveu, T.W. Melnyk, S.E. Oliver, S.C. Sheppard, K.H. Witzke, L.C. Wojciechowski, and D.M. Wuschke (editor), Preliminary Assessment of bedrock disposal of low and intermediate level waste at the Chalk River Nuclear Laboratories Site: Performance Assessment. Atomic Energy of Canada Limited Protected Report, COG-96-369, 1998
- 58) **LeNeveu, D.M.** Radionuclide Mass Transfer Rates from a Pinhole in a Waste Container for an Inventory-Limited and Constant Concentration Source, Nuclear Technology, Vol. 123 Aug. 1998
- 59) LeNeveu, D.M. Boundary-Element and Laplace-Transform Methods as Applied to the Advection-Dispersion Equation. In: Proceedings of the 56th Annual Canadian Geo-technical Society and the 4th Joint IAH-CNC and CGS Groundwater Specialty Conference, Winnipeg, Manitoba, Sept 29-Oct 1,2003
- 60) Walton, F., Tait, J.C., LeNeveu, D.M. and Sheppard, M.I. Geological Storage of CO₂: A Statistical Approach to Assessing Performance and Risk. In, E.S.Rubin, D.W.Keith and C.F.Gilboy (Eds.), Proceedings of 7th International Conference on Greenhouse Gas Control Technologies. Volume 1: Peer-Reviewed Papers and Plenary Presentations, IEA Greenhouse Gas Programme, Cheltenham, UK., 2004
- 61) LeNeveu, D.M., Walton, F.B., Tait and J.C. Haug, K, The Role of the Upper Geosphere in Mitigating CO₂ Surface Releases in Wellbore Leakage Scenarios, In, Proceedings of the Fifth Annual Conference on, Carbon Capture and Sequestration, Alexandria Mark Center, Alexandria Virginia, May 8-11, 2006.
- 62) **LeNeveu, D.M.** CQUESTRA, A Risk and Performance Acceptance Code for Geological Sequestration of Carbon Dioxide. Energy Conservation and Management Vol. 49 Jan. 2008
- 63) **LeNeveu, D. M.,** Analysis of potential acid gas leakage from wellbores in Alberta, Canada, International Journal of Greenhouse Gas Control, **5:** 862-879, 2011
- 64) LeNeveu, D.M., Potential for Environmental Impact due to acid gas leakage from wellbores at EOR injection sites near Zama Lake, Alberta, Greenhouse Gases Science and Technology 2:1-16, 2012, Society of Chemical Industries and John Wiley and Sons Ltd.
- 65) **LeNeveu, D.M.** Reports submitted for the Canadian Premium Sand Extraction Project in Wanipigow Manitoba

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