

CNS Conferences and Seminars

CEGB Workshop 'Chemical Reactivity of Oxide Fuel and Fission Product Release,'¹ 7-9 April 1987, Berkeley, UK

This Central Electricity Generating Board (CEGB) Workshop, co-sponsored by the British Nuclear Energy Society and the Canadian Nuclear Society, was the latest of the annual workshops on dry storage, which includes the 1984 Ontario Hydro Workshop on Irradiated Fuel Storage. It was attended by about 50 experts from the UK, France, Germany, Holland, the US (ORNL, LLL and PNL), and Canada. Three Canadian papers were presented by AECL and Ontario Hydro staff (see attached program) and the session 'Oxidation of UO_2 in air and fission product release' was chaired by C.R. Frost (Ontario Hydro).

The UO_2 oxidation / fission product release work reported at the workshop provides data to assist a) design of interim irradiated fuel dry storage facilities, and b) estimates of the radiological consequences of postulated low-probability in-reactor accidents. The workshop proceedings, including an account of the discussion periods, will be issued by the CEGB within 4 months.

Mechanisms of Oxidation of UO_2 in Air

'Structural Aspects of the Oxidation of UO_2 .' N. Holmes and G.C. Allen, CEGB, Berkeley Nuclear Laboratories, UK.

'Investigation of the Mechanisms of UO_2 Oxidation in Air - The Role of Grain Size.'

P. Wood and G.H. Bannister, CEGB, Berkeley Nuclear Laboratories, UK.

'The Effect of Oxygen Partial Pressure on the Kinetics of Unirradiated UO_2 Oxidation.' P.M. Tucker, CEGB, Berkeley Nuclear Laboratories, UK.

'Surface Morphology and Characterisation of UO_2 Fuel Pellets Oxidised in Air at 230°C and 270°C.' P.A. Tempest, P.M. Tucker and J.W. Tyler, CEGB, Berkeley Nuclear Laboratories, UK.

'Release of Fine Particulate on the Oxidation of UO_2 in Air.' J.F.B. Payne and D. Butterworth, CEGB, Berkeley Nuclear Laboratories, UK.

Oxidation of UO_2 in Air and Fission Product Release

'Progress of Air Oxidation Tests of LWR Spent Fuel in an Imposed γ -Field.' E.R. Gilbert, T.K. Campbell, C.A. Knox, G.F. Piepel, Battelle, Pacific Northwest Laboratories, U.S.A.

'Influence of Manufacturing Route and Burnup on the Oxidation and Fission Gas Release Behaviour of Irradiated UO_2 in Air at 175 - 400°C.' M.J. Bennett, J.B. Price, P. Wood, UKAEA, Harwell and CEGB, BNL, UK.

'Fission Product and U_3O_8 Particulate Emission Arising from the Oxidation of irradiated UO_2 - Preliminary Studies.' R. Williamson and S.A. Beetham, UKAEA, Harwell, UK.

'Fission Product Release and UO_2 Oxidation.' F.C. Iglesias, C.E.L. Hunt, D.S. Cox, N.A. Keller, R.D. Barrand, J.R. Mitchell, R.F. O'Connor, AECL, Chalk River, Canada.

'The Oxidation of Unirradiated UO_2 in CO_2 / O_2 Atmospheres.' J. Edwards, W.E. Ellis, F. Frazer, UKAEA, Windscale, UK.

Oxidation of (U, Pu) O_2 in Air and Dry Fuel Storage

'Heating of Untight LMFBR Fuel Elements under Oxidising Atmospheres.' J. Rouault and J. Girardin, CEA, Cadarache, France.

'Experimental Study of Fission Product Release from a Breached LMFBR Fuel Pin under Oxidising Conditions.' J. Birardin and J. Rouault, CEA, Cadarache, France.

'Predicting Spent Fuel Oxidation States in a Tuff Repository.' R.E. Einziger, R.E. Woodley, Westinghouse Hanford, U.S.A.

'The Chemical State of Fission Products in LWR Fuels Related to Long-Term Dry Storage.' R. Kohli, Battelle, Columbus Division, U.S.A.

'UO₂ Oxidation in Air at 50°C to 400°C and the Implications for CANDU Irradiated Fuel Dry Storage.' C.R. Frost and K.M. Wasywich, Ontario Hydro and AECL, Canada.

'Application of the UO₂ Oxidation Data to the Interim Storage of Irradiated Fuel in an Air Environment.' D.J. Wheeler, GEC – Energy Systems Limited, UK.

Oxidation of UO₂ and Fission Product Release in Reactor Coolant

'Fission Gas Release from Irradiated UO₂ during Post-Irradiation Annealing in CO₂/CO Atmospheres.' J.C. Killeen and J.A. Turnbull, CEGB, Berkeley Nuclear Laboratories, UK.

'Fission Product Release from Defective Fuel.' B.J. Lewis, AECL, Chalk River Nuclear Laboratories, Canada.

'The Influence of Environment on Release Behaviour and Chemical Forms of Fission Products Released under LWR Accident Conditions.' J.L. Collins, M.F. Osborne, R.A. Lorenz, Oak Ridge National Laboratory, U.S.A.

Oxidation of UO₂ and Fission Product Release in Reactor Coolant

'Transient Release of Iodine and Caesium from Spent Fuel in the Presence of Zircaloy and Oxygen.' G. Kaspar and M. Peehs, KWU, Federal Republic of Germany.

'The Role of Zircaloy Cladding on Fission Product Tellurium Release during a Severe Reactor Accident.' B.R. Bowsher, S. Dickinson, R.A. Gomme, A.L. Nichols, J.S. Ogden, UKAEA, Winfrith and University of Southampton, UK.

'Chemical Speciation of Fission Products using Matrix Isolation Infrared Spectroscopy and Mass Spectroscopy.' B.R. Bowsher, R.A. Gomme, J.S. Ogden, UKAEA, Winfrith and University of Southampton, UK.

Instructions for Authors

Scope of the Journal

The *Nuclear Journal of Canada*, published quarterly, is an international journal devoted to original contributions in all fields related to nuclear science, engineering, and medicine, including related science, engineering and technologies, materials, underlying principles, and social and ethical issues. Original articles, notes, and critical reviews will be considered for publication in the *Journal*. Submissions will be refereed. The Editor reserves the right to reject any submission deemed unsuitable for publication.

Original articles must be of a reasonably broad scope and of significance to the nuclear community. Notes should describe significant work in progress or of a novel nature.

Papers and discussions are published in English or French at the author's preference. The International System of Units (SI) must be used.

Manuscripts

Normal manuscript length is in the range of 5,000 – 15,000 words. The original and four copies should be submitted to the Editor, who will acknowledge receipt. The manuscript will then be sent to an Editorial Board member, who will arrange for independent reviews of the manuscript. Following review, the manuscript will either be approved for publication, or will be returned to the author if judged unsuitable for the *Nuclear Journal of Canada*. Upon acceptance, the Editor will contact the author to advise on the issue in which the paper will appear and the publication deadlines.

The manuscript should be typewritten, or computer printed (NLQ), in black ink, double-spaced, single-sided, on paper 210 × 297 mm (8 × 11 in.) with 25 mm left and right margins. Each page should be numbered starting with the title page. The following items are to be included:

Title Page should specify title, author names, affiliations, full postal addresses, and telephone numbers, number of pages of text, number of figures, and number of tables.

Abstracts should be not more than 150 words and on a separate page. The abstract should emphasize the new results and be self-contained so that it can be used by the abstract services without change. One should not have to read the paper in order to understand the abstract. The use of the first person singular pronoun must be avoided. Authors able to submit abstracts in both English and French should do so, in the interests of clarity, accuracy and speed of production. References should not be cited in the abstract.

Keywords should not exceed fifteen and should be placed directly below the abstract. All keywords used should be referenced in the 'Thesaurus of Engineering and Scientific Terms,' published by the Engineers Joint Council (New York).

Equations and formulae should be numbered in square brackets flush with the right hand margin. Unusual and Greek characters should be clearly identified.

References should be cited in parentheses in the text, by authors' last names and year of publication. For example: 'Previous studies (Critoph 1977; Duret 1978; and Notley 1983) indicate that ...' All citations should be listed on a 'Notes and References' page following the text. They should appear unnumbered, alphabetically by author, in the format:

Author(s) (names followed by initials). Title of article, book, or thesis. Name of publication, publisher, or university. Location. Volume or edition. Year. First and last page of article, or pages in book. (If there are two authors, both should be named in full; if more than two, the citation should give the first author's name followed by 'et al.')

Tables should be typed on separate sheets. Their desired location should be indicated in the text. Tables should be numbered with Arabic numerals. Complicated column headings should be avoided. Descriptive footnotes should be indicated by superscripts, (a), (b), (c), etc. and begun anew for each table.

Figures should be numbered with Arabic numerals. The figure number is to be shown on the back of each figure. On a separate piece of paper, attached to the back of the figure, is to be shown the author name(s), the title of the paper, the figure number, the figure caption, the orientation on the page and any instructions with regard to cropping. Lettering should be large enough to be legible after reduction of the figure to a single-column width of 8.5 mm. Capital letters after this reduction should have a height of 1.5 – 2.0 mm. Photographs should be glossy prints and should have maximum contrast.

Acknowledgements should be written in the third person and kept to a concise recognition of relevant contributions and financial support.

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Books for Review

Books for review should be offered or sent to the Editor. Book reviews will be published as space permits.