

Nuclear Development

**Accelerator-driven Systems (ADS)
and Fast Reactors (FR) in
Advanced Nuclear Fuel Cycles**

A Comparative Study

NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

REFERENCES

- [1] OECD Nuclear Energy Agency, *Nuclear Energy in a Sustainable Development Perspective*, Paris (France), 2000.
- [2] OECD Nuclear Energy Agency, *Actinide and Fission Product Partitioning and Transmutation. Status and Assessment Report*, Paris (France), 1999.
- [3] *The Technology of the Integral Fast Reactor and its Associated Fuel Cycle*, Special Issue Progress in Nuclear Energy, Vol. 31, Number 1/2, 1997.
- [4] OECD Nuclear Energy Agency, *Physics of Plutonium Recycling. Issues and Perspectives*, Vol. 1, Paris (France), 1995.
- [5] OECD Nuclear Energy Agency, *Advanced Reactors with Innovative Fuels (ARWIF)*, Workshop Proceedings, Villigen (Switzerland), 21-23 October 1998, Paris (France), 1999, and *Workshop on Advanced Reactors with Innovative Fuels*, Chester, United Kingdom, 22-24 October 2001.
- [6] M. Nakamura *et al.*, *Present Status of the OMEGA Program in Japan*, Proceedings of the 2nd OECD/NEA Information Exchange Meeting on Actinide and Fission Product Separation and Transmutation, Argonne (USA), 1992.
- [7] M. Salvatores *et al.*, *The SPIN Program at CEA: Transmutation Aspects*, Proceedings of the Int. Conf. on Future Nuclear Systems: Emerging Fuel Cycles and Waste Disposal Options (Global'93), Seattle (USA), 1993.
- [8] *A Roadmap for Developing Accelerator Transmutation of Waste (ATW) Technology*, a Report to Congress, DOE/RW-0519, October 1999.
- [9] *A European Roadmap for Developing Accelerator-driven Systems (ADS) for Nuclear Waste Incineration*, Report of the European Technical Working Group on ADS, April 2001.
- [10] *Safety Assessment of Spent Fuel Disposal in Hästholmen, Kivetty, Olkiluoto and Romuvaara. TILA-99*, report POSIVA 99-07, Posiva Oy, Helsinki (Finland), 1999.
- [11] *Viability Assessment of a Repository at Yucca Mountain*, report DOE/RW-0508, 1998. <http://www.ymp.gov/documents/va/index.htm>.
- [12] *Kristallin-I Safety Assessment Report*, Nagra Technical Report NTB 93-22, Nagra, Wettingen (Switzerland), 1994.
- [13] Sillen and J. Marivoet, *Spent Fuel Performance Assessment for an Hypothetical Repository in the Boom Clay at the Mol Site (Belgium)*, Report BLG-877, SCK•CEN, Mol (Belgium), 2001.

- [14] M. Salvatores, I. Slessarev and M. Uematsu, *A Global Physics Approach to Transmutation of Radioactive Nuclei*, Nucl. Sci. Eng., 116, 1-18, 1994.
- [15] F. Venneri, C.D. Bowman and S.A. Wender, *The Physics Design of Accelerator-driven Transmutation Systems*, Proceedings of the Int. Conf. on Evaluation of Emerging Nuclear Fuel Cycle Systems (Global'95), 11-14 September 1995, Versailles (France), p. 474.
- [16] G. Youinou, P. Wydler and S. Pelloni, *Toxicity Reduction in Accelerator-driven Transmutation Systems with Molten Salt Cores*, Proceedings of the 2nd Int. Conf. on Accelerator-driven Transmutation Technologies and Applications, 3-7 June 1996, Kalmar (Sweden), p. 203.
- [17] P. Wydler, L.H. Baetslé, *Closing the Nuclear Fuel Cycle: Issues and Perspectives*, Proceedings of the 6th Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, 11-13 December 2000, Madrid (Spain), EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [18] T. Mukaiyama *et al.*, *R&D Strategy for Partitioning and Transmutation under OMEGA Programme and Neutron Science Project of JAERI*, Proceedings of the 5th Int. Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, 25-27 November 1998, Mol (Belgium), EUR 18898 EN, p. 65, OECD/NEA, Paris (France), 1999.
- [19] J. Vergnes *et al.*, *The AMSTER Concept: A Configuration Generating its Own Uranium with a Mixed Thorium and Uranium Support*, Int. Conf. on the Back-end of the Fuel Cycle (Global 2001), 9-13 September 2001, Paris (France), (CD ROM).
- [20] T. Takizuka *et al.*, *Dedicated Accelerator-driven System for Nuclear Waste Transmutation*, Proceedings of the 3rd Int. Conf. on Accelerator-driven Transmutation Technologies and Applications, Praha (Pruhonice), 7-11 June 1999, Czech Republic, Paper Mo-O-F15, (CD ROM).
- [21] B. Carlucci, L. Cinotti, *ADS: Status of the Studies Performed by the European Industry*, 6th OECD/NEA Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, 11-13 December 2000, Madrid (Spain), EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [22] J.C. Alder, D. McGinnes, *Model Radioactive Waste Inventory for Swiss Waste Disposal Projects*, Nagra Technical Report NTB 93-21, Nagra, Wettingen (Switzerland), 1994.
- [23] J. Vergnes *et al.*, *Limiting Plutonium and Minor Actinides Inventory: Comparison Between Accelerator-driven System (ADS) and Critical Reactor*, Proceedings of the Int. Conf. on Future Nuclear Systems (Global'99), 29 August-3 September 1999, Jackson Hole, Wyoming (USA), (CD ROM).
- [24] H.M. Beaumont *et al.*, *CAPRA Core Studies. High Burn-up Core – Conceptual Study*, Proceedings of the Int. Conf. on Future Nuclear Systems (Global'97), 5-10 October 1997, Yokohama (Japan), p. 137.
- [25] *Physics of Plutonium Recycling*; Vol. IV, *Fast Plutonium-burner Reactors: Beginning of Life (1995)*; Vol. V, *Plutonium Recycling in Fast Reactors (1996)*, OECD/NEA, Paris (France).

- [26] W.S. Yang and H.S. Khalil, *Blanket Design Studies of a Lead-bismuth Eutectic-cooled Accelerator Transmutation of Waste System*, Nuclear Technology, Vol. 135, August 2001.
- [27] *Utility Industry Review of the ALMR Plant Design Programme*, San Jose (California), 20-21 May, 1993.
- [28] OECD Nuclear Energy Agency, *Comparison Calculations for an Accelerator-driven Minor Actinide Burner*, Paris (France), (To be published).
- [29] M. Cometto, *Standardisation des outils de calculs pour les ADS et leur application à différents scénarios de transmutation de déchets*, doctoral thesis to be submitted to EPFL, Lausanne (Switzerland), 2002.
- [30] M. Samson *et al.*, *Cesar: A Simplified Evolution Code for Reprocessing Applications*, Proceedings of the 5th Int. Conf. on Recycling, Conditioning and Disposal (RECOD 98), 25-28 October 1998, Nice (France), p. 986.
- [31] J.Y. Doriath *et al.*, *ERANOS I: The Advanced European System of Codes for Reactor Physics Calculation*, Proceedings of the Int. Conf. on Mathematics Methods and Supercomputing in Nuclear Applications, 19-23 April 1993, Karlsruhe (Germany).
- [32] Safety Series No. 115, IAEA, 1996.
- [33] J.P. Grouiller *et al.*, *Cycle du combustible des réacteurs à neutrons rapides – système de codes “MECCYCO”*, Proceedings of the Int. Conf. on the Physics of Reactors: Operation, Design and Computation (Physor’90), 23-27 April 1990, Marseille (France), p. XI-24.
- [34] P. Wydler and E. Curti, *Closing the Fuel Cycle: Consequences for the Long-term Risk*, Proceedings of the Int. Conf. on Future Nuclear Systems (Global’97), 5-10 October 1997, Yokohama (Japan), p. 201.
- [35] E. Gonzalez *et al.*, *Transuranics Transmutation on Fertile and Inert Matrix Lead-bismuth Cooled ADS*, 6th OECD/NEA Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, 11-13 December 2000, Madrid (Spain), EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [36] J.P. Grouiller *et al.*, *Nuclear Materials Recycling in Conventional or Advanced Reactors: a Scenario Study*, Proceedings of the Int. Conf. on Future Nuclear Systems (Global’99), 29 August-3 September 1999, Jackson Hole, Wyoming (USA), (CD ROM).
- [37] C. De Saint Jean *et al.*, *Optimisation of Moderated Targets for the Incineration of Minor Actinides in a Fast Reactor in the Framework of Scenario Studies*, Int. Conf. on the Back-end of the Fuel Cycle (Global 2001), 9-13 September 2001, Paris (France), (CD ROM).
- [38] J.C. Lefevre *et al.*, *European Fast Reactor: Outcome of Design Studies*, EFR Associates, 1998.
- [39] Int. Colloquium on European Pressurized Reactor, 13-14 November 1995, Strasbourg (France).
- [40] S. Pilate *et al.*, *Americium Targets in Fast Reactors*, 6th OECD/NEA Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, 11-13 December 2000, Madrid (Spain), EUR 19783 EN, OECD/NEA, Paris (France), 2001.

- [41] H. Bairiot *et al.*, *Plutonium Coated Particles Development*, Nuclear Technology, Vol. 23, September 1974.
- [42] European Commission, *Evaluation of Possible Partitioning and Transmutation Strategies and of Means for Implementing Them*, EUR 19128, 2000.
- [43] See, for example, D. Warin *et al.*, *10 Years EFTTRA:1992-2001*, Proceedings, Global'01, September 9-13, 2001, Paris (France), Paper No. 204.
- [44] OECD Nuclear Energy Agency, *The Safety of the Nuclear Fuel Cycle*, Paris (France), 1993.
- [45] E.P. Horwitz, *et al.*, Proceedings, International Solvent Extraction Conference, ISEC '90, Kyoto (Japan), 1990.
- [46] B. Weaver and F.A. Kappelmann, *TALSPEAK: A New Method of Separating Americium and Curium from Lanthanides by Extraction from an Aqueous Solution of Aminopolyacetic Acid Complex with a Monoacidic Phosphate or Phosphonate*, ORNL-3559, 1964.
- [47] *New Partitioning Techniques for Minor Actinides*, European Commission Nuclear Science and Technology, EUR 19149 EN, 2000.
- [48] Y. Zhu *et al.*, *Removal of Actinide Elements from High Level Radioactive Waste by Trialkylphosphine Oxide (TRPO) Cascade Extraction: Verification with Synthetic HAW Solution*, CNIC-00583, 1992.
- [49] Y. Zhu, *Radiochimica Acta* **68**, pp 95-98 (1995).
- [50] J.J. Laidler *et al.*, *Preparation of a Technology Development Roadmap for the Accelerator Transmutation of Waste (ATW) System: Report of the ATW Separations Technologies and Waste Forms Technical Working Group*, ANL-99/15, August 1999.
- [51] O.V. Skiba *et al.*, *Technology of Pyroelectrochemical Reprocessing and Production of Nuclear Fuel*, Proceedings, Global'93, p. 1344, 1993.
- [52] J.J. Laidler, *Reprocessing of Gas-cooled Reactor Particulate Graphite Fuel in a Multi-strata Transmutation System*, Proceedings, Global'01, Paper No. 024, 2001.
- [53] L.S. Chow *et al.*, *Continuous Extraction of Molten Chloride Salts with Liquid Cadmium Alloys*, Proceedings, Global'93, p. 1080, 1993.
- [54] R.P. Bush, A.L. Mills, M.L. Stearn, *Comparison of the Plant Requirements, Process Performance and Waste Arisings for Potential Processes for the Partitioning of High Level Waste*, Global'95 International Conference on Evaluation of Emerging Nuclear Fuel Cycle systems, September 11-14, Palais des Congrès, Versailles (France), Vol. 1, pp. 232-239, 1995.
- [55] OECD Nuclear Energy Agency, *Actinide Separation Chemistry in Nuclear Waste Streams and Materials*, Paris (France), 1997.
- [56] D. Lelièvre *et al.*, *Additional Information on Partitioning*, In: "Perspectives and Cost of Partitioning and Transmutation of Long-lived Radionuclides", European Commission Nuclear Science and Technology, EUR 17485 EN, pp. B-3-B-89, 1997.

- [57] R. Cummings, C.E. Crookshanks, R. McAdams, J.M. Rogers, H.E. Sims, J.L. Smith-Briggs, *An Assessment of Partition and Transmutation Against UK Requirements for Radioactive Waste Management: Supporting Studies*, DOE Report No. DOE/RAS/96.010, 1996.
- [58] M.S. Wechsler *et al.*, *Radiation Effects on Stainless Steel Materials in Accelerator-based Spallation Neutron Sources*, Proceedings of the Topical Meeting on Nuclear Applications of Accelerator Technology, American Nuclear Society, November 16-20, 1997, Albuquerque, New Mexico (USA), pp. 21-28, 1997.
- [59] ORNL, National Spallation Neutron Source Waste Minimisation/Pollution Prevention Plan, NSNS/97-5, May 1997, http://www.ornl.gov/~nsns/CDRDocuments/ProjectDocs/NSNS97_5.pdf.
- [60] J.P. Ackerman *et al.*, *Treatment of Wastes in the IFR Cycle*, Progress in Nuclear Energy, Vol. 31, No. 1/2, pp. 141-154, 1997.
- [61] K. Kinoshita, M. Kurata, T. Inone, *Estimation of Material Balance in Pyrometallurgical Partitioning Process for TRUs from HLLW*, Actinide and Fission Product Partitioning and Transmutation, Proceedings of the 5th International Information Exchange Meeting, Mol (Belgium), 25-27 November 1998, EUR 18898 EN, pp. 169-178, OECD/NEA, Paris (France), 1999.
- [62] L.H. Baetslé, Ch. De Raedt, *Limitations of Actinide Recycle and Fuel Cycle Consequences: a Global Analysis, Part 1: Global Fuel Cycle Analysis*, Nuclear Engineering and Design, No. 168, pp. 191-201, 1997.
- [63] B.W. Spencer, *The Rush to Heavy Liquid Metal Reactor Coolants – Gimmick or Reasoned*, Proc. ICONE 8, Paper 8729, Baltimore (USA), April 2000.
- [64] B.F. Gromov, O.G. Grigoriev, A.V. Dedoul *et al.*, *Use of Russian Technology of Ship Reactors with Lead-bismuth Coolant in Nuclear Power*, Conference on Heavy Liquid Metal Coolants in Nuclear Technology, HLMC-98, Obninsk (Russian Federation), 1999.
- [65] B.F. Gromov, Y.I. Orlov, P.N. Martynov *et al.*, *Technology Problems of Heavy Liquid Metal Coolants (Lead-bismuth, Lead)*, Conference on Heavy Liquid Metal Coolants in Nuclear Technology, HLMC-98, Obninsk (Russian Federation), 1999.
- [66] E.O. Adamov, V.V. Orlov, A.I. Filin *et al.*, *The Next Generation of Fast Reactors*, Nucl. Eng. and Design, 173, pp. 143-150, 1997.
- [67] E.O. Adamov, V.V. Orlov, A.I. Filin *et al.*, *Conceptual Design of BREST-300 Lead-cooled Fast Reactors*, Proc. ARS'94, Vol. 1, p. 509, 1994.
- [68] US Department of Energy: Generation IV, *Looking to the Future of Nuclear Power*, Office of Nuclear Energy, Science and Technology, 2000.
- [69] D.C. Wade, D.J. Hill, *Requirements and Potential Development Pathways for Fission Energy Supply Infrastructures of 21st Century – A Systems Viewpoint*, Global'99, Jackson Hole (USA), 1999.
- [70] H. Takano, H. Akie, T. Hiraoka *et al.*, *A Design Study for Inherent Safety Core, Aseismicity and Heat Transport System in Lead-cooled Nitride Fuel Reactor*, Proc. ARS'94, Vol. 1, p. 549, 1994.

- [71] N. Ueda, A. Minato, N. Handa *et al.*, *Super-safe, Small and Simple Reactors for the Global Energy Demand*, Proceedings Intl. Conf. on Fast Reactors and Related Fuel Cycles, Kyoto (Japan), 1991.
- [72] J. Chermanne *et al.*, *The Gas-cooled Breeder Reactor, a Concept Based on Mature Technology*, Conf. on Nuclear Energy Maturity, Paris, April 1975, Proceedings Vol. 1 (Nuclear Power Plant Design and Construction), Pergamon Press, Oxford, 1976.
- [73] R. Takeda, M. Aoyama, M. Moriwaki *et al.*, *General Features of Resources-renewable BWR and Scenario of Long-term Energy Supply*, Proc. Global'95, Versailles (France), p. 938, 1995.
- [74] G. Heusener, U. Müller, D. Squarerr, *High Performance Light Water Reactor (HPLWR)*, Nuclear Europe Worldscan, 1-2/2000.
- [75] Y. Fujiie *et al.*, Proceedings of International Conference on Design and Safety of Advanced Nuclear Power Plants (ANP'92), Vol. II, p.11.3-1, Tokyo (Japan), October 25-29, 1992.
- [76] K. Kobayashi *et al.*, *Applicability Evaluation of MOX Fuel Fast Breeder Reactor to the Self-consistent Nuclear Energy System*, Proceedings of Global'97, p. 1062-1067, 1997.
- [77] R. Takagi, H. Matsuura, Y. Fujiie *et al.*, Proceedings of Global'94, 1994.
- [78] K. Ikeda, Y. Enokido, T. Kawakita *et al.*, *Feasibility Study of Nitride Fuel Core and Recycle System Toward Self-consistent Nuclear Energy System*, Proceedings of Global'97, 1997.
- [79] H. Takano, H. Akie, M. Handa *et al.*, *A Concept of Self-completed Fuel Cycle Based on Nitride Fuel Lead-cooled Fast Reactor*, Proc. of 7th International Conference on Emerging Nuclear Energy Systems, ICENES'93, p. 308, 1993, World Scientific.
- [80] T. Osugi, H. Takano, T. Ogawa *et al.*, *A Conceptual Design Study of Self-completed Fuel Cycle System*, Proceedings Global'95, 1995.
- [81] PCAST, *Federal Energy Research and Development for the Challenges of the Twenty-first Century*, Panel on Energy Research and Development, November 1997.
- [82] W. Chernock, K.E. Horton, *Status of Liquid Metal Reactor Development in the United States of America*, pp. 68-87, Status of Liquid Metal Fast Reactor Development – Proceedings of the 27th meeting of the IWGFR held in Vienna (Austria), 17-19 May 1994, IAEA-TECDOC-791.
- [83] H. Seikimoto, *Physics of Future Equilibrium State of Nuclear Energy Utilisation*, Proceedings of the International Conference on Reactor Physics and Reactor Computations, p. 515, Tel Aviv (Israël), 23-26 January 1994.
- [84] *Programme of Nuclear Power Development in the Russian Federation for the 1998-2005 Period and up to 2010*.
- [85] C. Rubbia *et al.*, *An Energy Amplifier for Cleaner and Inexhaustible Nuclear Energy Production Driven by a Particle Accelerator*, CERN/AT/93-47 (ET) 1993.
- [86] M. Salvatores, *Accelerator-driven Systems : Physics Principles and Specificities*, J. Phys. IV France 9, p. 17-33, 1999.

- [87] M. Salvatores *et al.*, *MUSE-1: A First Experiment at MASURCA to Validate the Physics of Sub-critical Multiplying Systems Relevant to ADS*, 2nd ADTT Conference, Kalmar (Sweden), June 1996.
- [88] H. Rief, H. Takahashi, *The Transient Behaviour of Accelerator-driven Sub-critical Systems*, Int. Meeting, “8^{ème} journées SATURNE”, May 1994.
- [89] G. Bell, S. Glasstone, *Nuclear Reactor Theory*, Van Nostrand, 1970.
- [90] M. Vanier, Private Communication.
- [91] Gandini, M. Salvatores, I. Slessarev, *Coupling of Reactor Power with Accelerator Current in ADS Systems*, Ann. Nucl. Energy, 27, 2000, 114.
- [92] S. Carpenter, *Measurements of Control Rod Worths using ZPPR*, Proceedings Specialist Meeting on Control Rod Measurements Techniques – Cadarache (France), April 1976, NEACRP-U-75.
- [93] See Proceedings of the Int. Spec. Meeting, *Utilisation and Reliability of High Power Proton Accelerators*, Mito (Japan), 13-15 October 1998, OECD/NEA, Paris (France), 1999.
- [94] S. Andriamonje *et al.*, Phys. Rev. Letters B 348 (1995), 697-709.
- [95] J.V. Cathcart, W.D. Manly, *The Mass Transfer Properties of Various Metals and Alloys in Liquid Lead*, Corrosop, 12, 43-47, 1956.
- [96] C.H. Lefhalm, J.U. Knebel, K. Mack, *Kinetics of Gas Phase Oxygen Control System (OCS) for Stagnant and Flowing Pb-Bi Systems*, J. of Nuclear Materials Vol. 296/1-3, pp. 301-304, 2001
- [97] G. Müller, G. Schumacher, F. Zimmermann, *Investigation on Oxygen Controlled Liquid Lead Corrosion of Surface Treated Steels*, Journal of Nuclear Materials 278, pp. 85-95, 2000.
- [98] C.E. Laird *et al.*, *Activation by Protons in Range-thick Lead and Tungsten Spallation Targets*, Nuclear Science and Engineering, 130, 320-339, 1998.
- [99] J.J. Park, D.P. Butt, C.A. Beard, *Review of Liquid Metal Corrosion Issues for Potential Containment Materials for Liquid Lead and Lead-bismuth Eutectic Spallation Targets as a Neutron Source*, Nuclear Design and Engineering, 196, 315-325, 2000.
- [100] G. Bauer, M. Salvatores, G. Heusener, *The MEGAPIE Initiative – Executive Outline and Status as per November 1999*, Paul Scherrer Institut, Villigen (Switzerland), 1999.
- [101] J.U. Knebel, X. Cheng, G. Müller, G. Schumacher, J. Konys, O. Wedemeyer, G. Grötzbach, L. Carteciano, *Thermalhydraulic and Material Specific Investigations into the Realisation of an Accelerator-driven System (ADS) to Transmute Minor Actinides, 2000 Status Report*, Forschungszentrum Karlsruhe, Wissenschaftliche Berichte FZKA 6618, 2001.
- [102] D. Bogert, *The Fermilab Injector Complex*, Proc. of the PAC’95.
- [103] LANPF, <http://www.lanl.gov>.

- [104] R. Gobin, *Reliability of the High Power Proton Source SILHI*, Proceedings of the 2nd Workshop on Utilisation and Reliability of High Power Accelerators, Aix-en-Provence (France), 22-24 November 1999, OECD/NEA, Paris (France), 2001.
- [105] K.F. Johnson *et al.*, *Commissioning of the Low-energy Demonstration Accelerator (LEDA) Radiofrequency Quadrupole (RFQ)*, Proceedings of PAC'99, New York (USA).
- [106] R. Ferdinand, *IPHI-RFQ Reliability Approach*, Proceedings of the 2nd Workshop on Utilisation and Reliability of High Power Accelerators, Aix-en-Provence (France), 22-24 November 1999, OECD/NEA, Paris (France), 2001.
- [107] Pagani, *Status and Perspectives of the SC Cavities for TESLA*, Proceedings of the 1999 CEC-ICNC, Montréal (Canada), July 1999.
- [108] H. Safa, *Reliability: a Challenge for Super-conducting Cavity Technology*, Proceedings of the 2nd Workshop on Utilisation and Reliability of High Power Accelerators, Aix-en-Provence (France), 22-24 November 1999, Paris (France), OECD/NEA, 2001.
- [109] M. Liepe, S.N. Simrock, *Adaptive Feed Forward for Digital RF Control System for the TESLA Test Facility*, in the Proceedings of the EPAC'98, Stockholm (Sweden), 1998.
- [110] *Conceptual Design of a 500 GeV e^+e^- Linear Collider with Integrated X-Ray Laser*, Eds.: R. Brinkmann, G. Materlik, J. Rossbach, A. Wagner, DESY 1997-048, ECFA 1997-182.
- [111] M. Eriksson, *Reliability Assessment of the LANSCE Accelerator System*, Thesis Royal Inst. of Technology, Stockholm (Sweden), 1998.
- [112] M.K. Craddock, *Critical Beam-intensity Issues in Cyclotrons*, Proceedings of the 15th Int. Conference on Cyclotrons and their Applications, Caen (France), p. 377, 1998.
- [113] L. Calabretta *et al.*, *Super-conducting Cyclotrons for Acceleration of H_2^+* , Proceedings of the 15th Int. Conference on Cyclotrons and their Applications, Caen (France), p. 665, 1998.
- [114] H.A. Willax, *Proposal for a 500 MeV Isochronous Cyclotron with Ring Magnets*, Proceedings Int. Conference on Sector-focused Cyclotrons and Meson Factories, CERN 63-19(1963)386.
- [115] Th. Stambach *et al.*, *The Feasibility of High Power Cyclotrons*, presented at the 4th Europ. Conference in Applied Research and Technology, Zurich, 1995, Nucl. Instr. and Meth. B 113(1995)1 and *Cyclotron Based Accelerators for Energy Production and Transmutation*, Intl. Conference on Accelerator-driven Transmutation Technologies and Applications, Las Vegas (USA), 1994, AIP Conf. Proc. 346(1995)229.
- [116] L.A. Sarkissian, *A Layout of a 2.7 GeV and 10 MW Cyclotron*, Proceedings of the 15th Int. Conference on Cyclotrons and their Applications, Caen (France), p. 393, 1998.
- [117] C. Rubbia *et al.*; Proceedings, EPAC, 1994, pp. 270; N. Fiétier *et al.*, *A Cyclotron-based Accelerator for Driving the Energy Amplifier*, CERN Report AT-95-03(ET) 1995; and Proceedings of the 14th Int. Conf. on Cyclotrons and their Applications, Cape Town, 1995, p. 598 and *High Intensity Cyclotrons for Driving Hybrid Nuclear Systems*, Proceedings of the 15th Int. Conference on Cyclotrons and their Applications, Caen (France), p. 389, 1998.

- [118] Y. Jongen, P. Cohilis, *A Proton-driven, Intense, Sub-critical, Fission Neutron Source*, Proceedings of the 14th Int. Conference on Cyclotrons and their Applications, Cape Town, 1995, p. 610.
- [119] Tumanian *et al.*, *Powerful Cyclotron for ADTT*, Proceedings of the 2nd Int. Conference on Accelerator-driven Transmutation Technologies, Kalmar (Sweden), 1996, ISBN 91-506-1220-4, p. 1065.
- [120] Y. Yano *et al.*, *RIKEN RI Beam Factory Project*, Proceedings of the 14th Int. Conference on Cyclotrons and their Applications, Cape Town, p. 590, 1995.
- [121] W. Joho, *High Intensity Problems in Cyclotrons*, Proceedings of the 9th Int. Conference on Cyclotrons and their Applications, Caen (France), p. 337, 1981.
- [122] Th. Stambach *et al.*, *Cyclotron Operation Beyond Limits*, Proceedings of the 15th Int. Conference on Cyclotrons and their Applications, Caen (France), p. 369, 1998.
- [123] Th. Stambach *et al.*, *The 0.9 MW Proton Beam at PSI and Studies on a 10 MW Cyclotron*, Proceedings of the 2nd Int. Conference on Accelerator-driven Transmutation Technologies, Kalmar (Sweden), 1996, ISBN 91-506-1220-4, p. 1013.
- [124] G. Bauer *et al.*, *Beam Trips and Target/Sub-critical Reactor Problems in ADS*, Workshop on Utilisation and Reliability of HPPA, Mito (Japan), 13-15 October 1998, p. 199, OECD/NEA, Paris (France), 1999.
- [125] A. Chabert *et al.*, Proceedings of the 7th Int. Conference on Cyclotrons and their Applications, Zurich, 1975, p. 245, and IEEE Trans. NS 22/3 (1975) 1930.
- [126] Chasman *et al.*, Nucl. Instr. & Meth. 219 (1984) 279.
- [127] OECD Nuclear Energy Agency, *Workshop on Utilisation and Reliability of HPPA*, Aix-en-Provence, 22-24 November 1999, Paris (France), 2001.
- [128] H. Fitze *et al.*, Proceedings of the 1999 PAC, Vol. 2, p. 795.
- [129] Ch. Stambach *et al.*, *The Cyclotron as Possible Driver for an ADS*, Workshop on Utilisation and Reliability of HPPA, Aix-en-Provence, 22-24 November 1999, OECD/NEA, Paris (France), 2001.
- [130] PSI Annual Report, Annex IV, 1998.
- [131] P. Sigg *et al.*, *Reliability of High Beam Power Cyclotron RF-systems at PSI*, Workshop on Utilisation and Reliability of HPPA, Mito (Japan), 13-15 October 1998, p. 199, OECD/NEA, Paris (France), 1999.
- [132] P. Sigg *et al.*, *Development of High power RF Systems with Excellent Reliability*, presented at the 1999 Part. Accelerator Conference, New York (USA), 1999.
- [133] Mariani *et al.*, Figure 3 in *An Electrostatic Splitter for the PSI 590 MeV Beam*, 6th Europ. Part. Acc. Conf, Stockholm (Sweden), 1998.
- [134] U. Schryber *et al.*, Figure 2 in *High Power Operation of the PSI Accelerators*, Proceedings of the 14th Int. Conference on Cyclotrons and their Applications, Cape Town, 1995, p. 32.

- [135] Y. Yamazaki, M. Mizumoto, *Accelerator Complex for the Joint Project of KEK/JHF and JAERI/NSP*, Particle Accelerator Conference, New York (USA), 29 March-2 April 1999.
- [136] N. Ouchi *et al.*, *Super-conducting Cavity Development for High Intensity Proton Linac in JAERI*, Proceedings of the 9th Workshop on RF super-conductivity, Santa Fe (USA), 1999.
- [137] M. Mizumoto *et al.*, *Development of Super-conducting Linac for the KEK/JAERI Joint Project*, Proceedings of LINAC2000, Monterey (USA), 2000.
- [138] Fistedis (Ed.), *The Experimental Breeder Reactor II Inherent Safety Demonstration*, Elsevier Science Publishers, B.V. Holland, 1987.
- [139] R. Hill and H. Kahlil, *Physics Studies for a Na-cooled ATW Design*, Proceedings IAEA Technical Committee Meeting on Core Physics and Engineering Aspects of Emerging Nuclear Energy Systems For Energy Generation and Transmutation, Argonne, IL (USA), November 28-December 1, 2000, (To be published).
- [140] R.A. Wigeland, *Comparison of the SASSYS/SAS4A Radial Core Expansion Reactivity Feedback Model and the Empirical Correlation for FFTF*, Trans. Am. Nucl. Soc., 55, p. 423, 1987.
- [141] R.A. Wigeland and T.J. Moran, *Radial Core Expansion Reactivity Feedback in Advanced LMRs: Uncertainties and their Effects on Inherent Safety*, ANS Topical Meeting on the Safety of Next Generation Power Reactors, May 1-5, 1988.
- [142] C.H.M. Broeders, *A Comparison of Some Neutronics Characteristics of Critical Reactors and Accelerator-driven Sub-critical Systems*, Proceedings of the 5th Intl. Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, Mol (Belgium), 25-27 Nov, 1998, EUR 18898 EN, OECD/NEA, Paris (France), 1999.
- [143] G. Ritter *et al.*, *Comparison Study of Hybrid vs. Critical Systems in Point Kinetics*, Proceedings of the 5th International Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, Mol, Belgium, (25-27 Nov, 1998), EUR 18898 EN, OECD/NEA, Paris (France), 1999.
- [144] E. Gonzalez *et al.*, *Transuranics Transmutation on Fertile and Inert Matrix Lead-bismuth Cooled ADS*, Proceedings of the 6th Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [145] F. Lypsch and R. Hill, *Development and Analysis of a Metal – Fueled Accelerator-driven Burner*, Proceedings of the American Institute of Physics International Conference on Accelerator-driven Transmutation Technologies and Applications, Las Vegas, Nevada (USA), July 1994.
- [146] H. Wider *et al.*, *Aspects of Severe Accidents in Transmutation Systems*, Proceedings of the 6th Information Exchange Meeting on Actinide and fission Product Partitioning and Transmutation, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [147] J. Wallenius *et al.*, *Analysis of Nitride Fuels in Cores Dedicated to Waste Transmutation*, Proceedings of the 6th Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.

- [148] F. Dunn, *Design Criteria and Mitigation Options for Thermal Fatigue Effects in ATW Blankets*, Proceedings IAEA Technical Committee Meeting on Core Physics and Engineering Aspects of Emerging Nuclear Energy Systems for Energy Generation and Transmutation, Argonne, IL (USA), November 28-December 1, 2000, (To be published).
- [149] T. Takizuka *et al.*, *Development of Accelerator-driven Transmutation System Concept and Related R&D Activities at JAERI*, Proceedings IAEA Technical Committee Meeting on Core Physics and Engineering Aspects of Emerging Nuclear Energy Systems For Energy Generation and Transmutation, Argonne, IL (USA), November 28-December 1, 2000, (To be published).
- [150] W. Maschek *et al.*, *Safety Analysis for ADS Cores With Dedicated Fuel, and Proposals for Safety Improvements*, Proceedings IAEA Technical Committee Meeting on Core Physics and Engineering Aspects of Emerging Nuclear Energy Systems for Energy Generation and Transmutation, Argonne, IL (USA), November 28-December 1, 2000, (To be published).
- [151] D.C. Wade and Fujita, *Trends Versus Reactor Size of Passive Reactivity Shutdown and Control Performance*, Nucl. Sci. & Eng. 103, p.182, 1988.
- [152] Gandini, Slessarev *et al.*, *ADS Performance in the Safety and Reliability Perspectives*, Proceedings, Workshop on Utilisation and Reliability of High Power Accelerators, Aix-en-Provence, France, November 22-24, 1999, OECD/NEA, Paris (France), 2001.
- [153] V. Oussanov *et al.*, *Long-lived Residual Activity Characteristics of Some Liquid Metal Coolants for Advanced Nuclear Energy Systems*, Proceedings of Global'99, International Conference, Jackson Hole, Wyoming (USA), Sept 1999.
- [154] J. Benlliure *et al.*, *New Data and Monte Carlo Simulations on Residue Production in Spallation Reactions Relevant for Design of ADS*, Proceedings of the 6th Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [155] A.S. Gerasimov *et al.*, *Accumulation of Activation Products in Pb-Bi, Tantalum, and Tungsten Targets of ADS*, Proceedings of 6th Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [156] M. Saito *et al.*, *Long-lived Spallation Products in Accelerator-driven Systems*, Proceedings IAEA Technical Committee Meeting on Core Physics and Engineering Aspects of Emerging Nuclear Energy Systems For Energy Generation and Transmutation, Argonne, IL (USA), November 28-December 1, 2000, (To be published).
- [157] J. Klein, *Structural Activation, Energy Deposition and Shielding Calculations Due to Proton Beam Loss in a High Proton Power Linear Accelerator*, Proceedings, Workshop on Utilisation and Reliability of High Power Accelerators, Aix-en-Provence, France, November 22-24, 1999, OECD/NEA, Paris (France), 2001.
- [158] D.C. Wade, *Safety Considerations in Design of Fast Spectrum ADS for Transuranic or Minor Actinide Burning: A Status Report on Activities of the OECD/NEA Expert Group*, Proceedings of the 6th Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, Madrid (Spain), December 11-13, 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.

- [159] J.G. Delene, L.C. Fuller, C.R. Hudson, *ALMR Deployment Economic Analysis*, Oak Ridge National Laboratory, ORNL/TM-12344, June 1993.
- [160] OECD Nuclear Energy Agency, *The Economics of the Nuclear Fuel Cycle*, Paris (France), 1994.
- [161] OECD Nuclear Energy Agency, *Methods of Projecting Operations and Maintenance Costs for NPPs*, Paris (France), 1995.
- [162] OECD Nuclear Energy Agency and IEA (International Energy Agency), *Projected Costs for Generating Electricity – Update 1998*, Paris (France), 1998.
- [163] R.A. Krakowski, “Top-Level” Costing of Advanced Nuclear Fuel Cycles: An Analysis of Concepts Being Considered in the NEA/NDC Co-operative Study of the Use of Fast Reactors (FR) and/or Accelerator-driven Systems (ADS) for Sustainable Nuclear Energy – Economics of Closing the Nuclear Fuel Cycle, LANL document LA-UR-01-1852 (rev.), April 2001.
- [164] C.G. Bathke, (2000), Los Alamos National Laboratory, Los Alamos, NM, Personal communication.
- [165] R.A. Krakowski, (1995), *Accelerator Transmutation of Waste Economics*, Nuclear. Technology, 110, 295, June 1995.
- [166] H. Trelue (2001), R.A. Krakowski, A.M. Morey, D.R. Liles, J.F. Dearing, J.P. Kaszuba, P.C. Lichtner, and F.V. Perry, *Results from a Multiple-objective Nuclear-fuel-cycle Optimisation Model*, Los Alamos National Laboratory document LA-UR-00-4526, (In preparation, March 2001).
- [167] R.H. Brogli, (2001) and R.A. Krakowski, *Degree of Sustainability of Various Nuclear Fuel Cycles*, Paul-Scherrer Institute report, (In preparation, 2001).
- [168] OECD Nuclear Energy Agency, *Trends in the Nuclear Fuel Cycle: Economic, Environmental and Social Aspects*, Paris (France), 2001.
- [169] OECD Nuclear Energy Agency, *Uranium 1999: Resources, Production and Demand*, Paris (France), 2000.
- [170] J.A. Palett, J.A.B. Gresley, *Recycled Uranium – a Valuable Commodity*, IAEA SM-294/45. Paper to IAEA International Symposium on the Back-end of the Nuclear Fuel Cycle, IAEA, Vienna (Austria), 1987.
- [171] OECD Nuclear Energy Agency, *Plutonium Fuel, an Assessment*, Paris (France), 1989.
- [172] Lawrence Livermore National Laboratory, *Summary of the Cost Analysis Report for the Long-term Management of Depleted Uranium Hexafluoride*, UCRL-ID-127650, September 1997.
- [173] OECD Nuclear Energy Agency, *The Cost of High-level Waste Disposal in Geological Repositories – An Analysis of Factors Affecting Cost Estimates*, Paris (France), 1993.
- [174] National Research Council, *Nuclear Wastes – Technologies for Separation and Transmutation*, National Academy Press, Washington, D.C., 1996.

- [175] J.M. Charpin, B. Dessus, R. Pellat (2000), *Étude économique prospective de la filière électrique nucléaire*, Rapport au Premier Ministre, Paris (France).
- [176] NIRAS/ONDRAF, ACTUA, Nr. 36-37, 2000.
- [177] Belgonucléaire, Private communication.
- [178] J.C. Lefebvre, *European Fast Reactor (EFR) 1998: Outcome of Design Studies*, Edited by EFR Associates, Framatome, Lyon (France).
- [179] C.A. Boardman (GE), *Economic Assessment of S-PRISM Including Development and Generating Costs*.
- [180] H. Noda (JNC), Private communication.
- [181] W.D. Burch, H.R. Yook, R.E. Lerch, *A Study of Options for the LMR Fuel Cycle*, Oak Ridge National Laboratory, ORNL/TM-9840, January 1986.
- [182] B.E. Prince, *Influence of Plant Scale in Commercial Reprocessing of LMFBR Fuels: Survey of Economic Aspects*, Oak Ridge National Laboratory, ORNL/TM-11687, July 1991.
- [183] B.C. Chow, *Plutonium Economics and the Civilian Nuclear Future*, Global'95, Versailles (France), September 11-14, 1995.
- [184] European Commission, *Impact of Accelerator-based Technologies on Nuclear Fission Safety*, IABAT-project, EUR 19608, 2000.
- [185] A Report to Congress on Electrometallurgical Treatment Waste Forms, US-DOE, March 2001, see <http://www.nuclear.gov/reports/ETRptConMarch2001.pdf>.
- [186] PNNL, *Estimated Cost of an ATW-system*, Pacific Northwest National Laboratory, PNNL-13018, September 1999.
- [187] Kim, M.S. Kazimi, N.E. Todreas, M.J. Driscoll, *Economic Analysis of the Fuel Cycle of Actinide Burning Systems*, Massachusetts Institute of Technology, Department of Nuclear Engineering, MIT-NFC-TR-019, February 2000.
- [188] M. Cometto *et al.*, *OECD/NEA Benchmark Calculations for Accelerator-driven Systems*, Proceedings of the 6th OECD/NEA Information Exchange Meeting on Partitioning and Transmutation of Actinides and Fission Products, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [189] K. Furutaka *et al.*, *Nuclear Data Measurements for P&T and Future Plans in JNC*, Proceedings of the 6th OECD/NEA Information Exchange Meeting on Partitioning and Transmutation of Actinides and Fission Products, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [190] Letourneau *et al.*, Nucl. Instr. and Methods B 170 (2000) 299.
- [191] Lott *et al.*, Nucl. Instr. and Methods A 414 (1998) 117.
- [192] Borne *et al.*, Nucl. Instr. and Methods A 385 (1997) 339.

- [193] M. Hugon, V.P. Bhatnagar and J. Martin Bermejo, *Advanced Concepts for Waste Management and Nuclear Energy Production in the EURATOM Fifth Framework Programme*, Global'01, Paris (France), September 2001.
- [194] Farget *et al.*, Nucl. Phys. A, (In print).
- [195] Ch. Madic, *Overview of the Hydrometallurgical and Pyro-metallurgical Processes Studied Worldwide for the Partitioning of High Active Nuclear Wastes*, Proceedings 6th OECD/NEA Information Exchange Meeting on Partitioning and Transmutation of Actinides and Fission Products, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [196] J. Laidler, private communication.
- [197] V.V. Ignatiev, *Molten Salts for Safe, Low Waste and Proliferation Resistant Treatment of Radwaste in Accelerator-driven and Critical Systems*, RRC – Kurchatov Institute, Moscow, 2001.
- [198] R.C. Briant *et al.*, *The Aircraft Reactor Experiment*, Nucl. Sci. Eng., 2, 797 (1957).
- [199] U. Gat, J.R. Engel and H.L. Dodds, *Molten Salt Reactors for Burning Dismantled Weapons Fuel*, http://home.earthlink.net/~bhoglund/uri_MSR_WPu.html.
- [200] P.N. Haubenreich, J.R. Engel, *Experience with the Molten Salt Reactor Experiment*, Nucl. Appl. Technol., 8, 118 (1970).
- [201] R.C. Robertson, Ed., *Conceptual Design Study of a Single-fluid Molten Salt Breeder Reactor*, ORNL-4541, Oak Ridge National Laboratory, June 1971.
- [202] H.G. MacPherson, *The Molten Salt Reactor Adventure*, NSE, 90, 374-380, 1985.
- [203] K. Furukawa, A. Lecocq, Y. Kato, K. Mitachi, J. Nucl. Sci. Tech., 27, 1157, 1990.
- [204] K. Furukawa, K. Minami, T. Oosawa, M. Ohta, N. Nakamura, K. Mitachi, Y. Kato, *Emerg., Nucl. Energy System*, p. 235, World Sci. (1987); K. Furukawa, K. Mitachi, Y. Kato: *Nucl. Engineering & Design*, 136, 157, 1992.
- [205] K. Furukawa, A. Lecocq, Y. Kato, K. Mitachi, LA-12205-C, pp. 686-697 (1991); K. Furukawa, *Atomkernenergie/Kerntech.*, 44, 42-45, 1984.
- [206] I. Slessarev, V. Berthou, M. Salvatores, A. Tchistiakov, *Concept of the Thorium Fuelled Accelerator Driven Sub-critical System for Both Energy Production and TRU Incineration – “Tasse”*, Proceedings of the 3rd International Conference on Accelerator-driven Transmutation Technologies and Applications ADTTA'99, Prague, June 7-11 1999.
- [207] Ch.D. Bowman, *Weapons and Commercial Plutonium Ultimate Disposition Choices. Destroy Completely or Store Forever*, in *Managing the Plutonium Surplus: Applications and Technical Options*, pp. 125-138, Kluwer Academic Publishers, Dordrecht (Netherlands), 1994.
- [208] Ch.D. Bowman, *Comparison of the Energy Amplifier and an Accelerator-driven Thermal Spectrum System for Commercial Waste Burning*, Report ADNA97-12, Los Alamos, NM, ADNA Corporation, Los Alamos, NM 87544, 1997.

- [209] Ch.D. Bowman, *Accelerator-driven Systems in Nuclear Energy; Role and Technical Approach*, Report ADNA/97-013, ADNA Corporation, Los Alamos, NM 87544, 1997.
- [210] Ch.D. Bowman, *Threshold Thermal Neutron Fluence for Initiation of a Runaway Chain Reaction in Minor Actinide Transmutation*, Report ADNA/97-014, ADNA Corporation, Los Alamos, NM 87544, 1997.
- [211] Ch.D. Bowman, *Once-through Thermal-spectrum Accelerator-driven System for LWR Waste Destruction Without Reprocessing: Average Fission Product Capture Cross-Sections*, Report ADNA/98-03, ADNA Corporation, Los Alamos, NM 87544, 1998.
- [212] Ch.D. Bowman, *Once-through Thermal-spectrum Accelerator-driven System for LWR Waste Destruction Without Reprocessing: Tier 1 Description*, Report ADNA/98-04, ADNA Corporation, Los Alamos, NM 87544, 1998.
- [213] Ch.D. Bowman, *Accelerator-driven Systems for Nuclear Waste Transmutation*, Ann. Rev. Nucl. Part. Sci. 48, 505-56, 1998.
- [214] Ch.D. Bowman, *Sustained Nuclear Energy Without Weapons or Reprocessing Using Accelerator-driven Systems*”, Proc. 3rd International Conference on Accelerator-driven Transmutation Technologies and Applications ADTTA’99, Prague, June 7-11, 1999.
- [215] P.N. Alekseev *et al.*, *Concept of the Cascade Sub-critical Molten Salt Reactor (CSMSR) for Harmonization of the Nuclear Fuel Cycle*, Global’99, Jackson Hole, Wyoming (USA), August 29-September 3 (1999); K. Furukawa and his group, *Important Papers concerning Thorium Molten-salt Nuclear Energy Synergetics – THORIMS-NES*, Tokai University, October 1994.
- [216] M. Valade, *Étude de l’incinération des transuranes en reacteur à sel fondu*, PhD. thesis, Université Louis Pasteur de Strasbourg, October 21 2000, 2000.
- [217] T. Mukaiyama, T. Takizuka, M. Mizumoto, Y. Ikeda, T. Ogawa, A. Hasegawa, H. Takada, H. Takano, *Review of Research and Development on Accelerator-driven System in Japan for Transmutation of Long-lived Nuclides*, Progress in Nuclear Energy, Vol. 38, No. 1-2, pp. 107-134, 2001.
- [218] H. Katsuta, T. Sasa, T. Takizuka, Y. Kato, T. Nishida, H. Takahashi, *A Concept of Accelerator Based Incineration System for Transmutation of TRU and FP with Liquid TRU-Alloy Target and Molten-salt Blanket*, 7th International Conference on Emerging Nuclear Energy Systems (ICENES’93), p. 424, Makuhari, 20-24 September 1993, 1993.
- [219] M. Salvatores, I. Slessarev, V. Berthou, *Review and Proposals about the Role of Accelerator-driven Systems Nuclear Power*, Progress in Nuclear Energy, Vol. 38, No. 1-2, pp. 167-178, 2001.
- [220] J. Vergnes *et al.*, *Le Concept AMSTER*, 6th OECD/NEA Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.

- [221] A. Dudnikov, P. Alekseev, N. Kotkin, L. Men'shikov, S. Subbotin, *Transmutation of Long-living Radioactive Waste in Critical and Cascade Sub-critical Molten Salt Reactors*, Proceedings of the 3rd International Conference on Accelerator-driven Transmutation Technologies and Applications ADTTA'99, Prague, June 7-11 1999, 1999.
- [222] A. Baxter, C. Rodriguez, M. Richards, J. Kuzminski, *Helium-cooled Reactor Technologies for Accelerator Transmutation of Nuclear Waste*, 6th OECD/NEA Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, Madrid (Spain), 11-13 December 2000, EUR 19783 EN, OECD/NEA, Paris (France), 2001.
- [223] F. Venneri, M. Fikani, A. Baxter, C. Rodriguez, *MHR/A-based Transmutation of Waste – An Integrated Approach to Nuclear Waste Transmutation Using HTGR Technology*, Private communication based on presentation given to US DOE, June-July 2001.