

OVERVIEW OF LESSONS LEARNT

A. Duncan, Rapporteur
C. Pescatore, NEA Secretariat
M. Federline, Chair of the seminar

During the Tarragona International Seminar the participating high-level specialists had very open and fruitful discussion concerning strategic decommissioning issues. The lessons learnt and possible solutions for future work issues can be found below.

Although there appears to be a trend towards early dismantling, there seemed to be general agreement that technical solutions support a wide variety of safe decommissioning approaches. Thus, in terms of decommissioning strategy, it appears that no one size fits all.

A flexible regulatory approach is needed in order to recognise the changing operational risks and physical conditions of facilities with time, and to optimise their dismantling.

The NEA has released a comprehensive study on decommissioning strategies and costs that indicates world-wide progress.[1] According to this report, over 50% of countries with nuclear facilities have a framework of decommissioning requirements and 60% have defined radioactive waste clearance levels. Up to about 70% of the costs of D&D are attributable to dismantling and waste management.

The provisions for safety of the D&D process are closely linked to the availability of the necessary funds as and when required.

A number of common factors were defined for successful implementation of decommissioning strategies: i.e. safety, technical feasibility of decommissioning options, risk-informed progression of D&D activities as project proceeds, maintenance of competency and corporate memory throughout project, waste management and disposal capability, financing that suits the scope of the project, a well-defined risk-informed and performance-based regulatory process, and establishment of effective communication with local and regional governments and key stakeholders, particularly personnel, at the earliest opportunity before decommissioning.

LWRs are relatively easier to dismantle than GCRs, because of the large amounts of contaminated materials, such as graphite, associated with the latter.

The techniques for dismantling fuel cycle facilities are essentially similar to those for dismantling nuclear power plants except that a safestore period would not be helpful in reducing the radioactivity of those facilities contaminated with long-lived radionuclides.

It is important that stakeholders feel that their considerations and concerns are addressed throughout the project.

Several programmatic and policy issues were raised including:

- Should the costs/benefits of adopting internationally consistent radioactive waste clearance levels, for use in decommissioning projects, be more heavily emphasised in the context of international business and competition?
- To what degree should institutional controls be relied on in safety cases for decommissioning options involving an element of long-term stewardship?
- Does the international trend toward independent national organisations having responsibility for waste management and disposal set a useful precedent?
- Is early dismantling and successful demonstration of technology a significant factor in establishing public confidence for building new plants? (This is key in the French and Japanese strategy.)

Regarding views on where bilateral and multilateral co-operation might enhance progress in defining and implementing decommissioning strategies, the following points were agreed.

- On the issue of radioactive waste clearance, an adequate scientific basis is available for defining clearance levels, but a high level discussion of is needed to look for solutions that can satisfy both international and national interests.
- There was general agreement, supported by the regulators present, that a simpler decommissioning regulatory framework would be beneficial.
- Although it was agreed that exchange of information on funding requirements and systems might be useful, differences in decommissioning work breakdown structures make it difficult to get good cost data.
- An international database on decommissioning experience would be useful. Several databases now exist and it may be useful to look at combining them.
- Societal factors are key to successful decommissioning projects and establishing pillars of trust is important at the earliest opportunity before decommissioning.

In addition to the above points, the seminar attendees were asked to identify the issues that were of significance to them and where they believed advice and further work by the international community might enable progress. They identified the following issues.

Stakeholder involvement

- Early discussion of plans with stakeholders.
- Continued dialogue with local communities.

Strategy selection

- Waste management provisions.
- Costs and funding arrangements.

Waste management and clearance

- Availability of waste disposal routes.
- Standards of clearance and effects of differences on decommissioning costs and international business.

Funding and costs

- Relationship between funding and safety.
- Hazards to the long-term security of funds.

Social demands

- Implementing “Pillars of Trust”. (Safety, participation and economic development.)

Concluding remarks

There may be an expectation amongst politicians and the public that there is a “right answer” to the choice of strategy selection for a particular type of facility, or even all facilities. This seminar and, indeed, wider experience shows that this is not the case.

- Local factors and national political positions have a significant input and often result in widely differing strategy approaches to broadly similar decommissioning projects. All facility owners represented could demonstrate a rational process for strategy selection and compelling arguments for the choices made.

The NEA, and in particular its Working Party on Decommissioning and Dismantling, which was one of the joint organisers of this event, will use these outcomes to inform its future work programme.

References

- [1] NEA, 203b, *Decommissioning Nuclear Power Plants – Policies, Strategies and Costs*, OECD\NEA, Paris (2003).

BIOGRAPHICAL SKETCHES

OPENING SESSION

Curriculum Vitae

Margaret V. FEDERLINE

As Deputy Director of the Office of Nuclear Material Safety and Safeguards at the US Nuclear Regulatory Commission (NRC), Mrs. Federline is responsible for ensuring public health and safety by managing the development of regulatory policy for the licensing and inspection of civilian uses of nuclear materials in industrial, medical, and fuel cycle applications, spent fuel transportation, as well as radioactive waste management and decommissioning.

Prior to assuming her current responsibilities, she served in increasingly responsible Senior Executive Service positions in NRC's Office of Research, Division of Waste Management, and Performance Assessment and Hydrology Branch. Mrs. Federline served as Senior Policy Advisor to NRC Chairperson Kenneth M. Carr and as Assistant to NRC's Executive Director for Operations. Prior to joining the Federal government, she participated in life sciences research and management of a commercial analytical chemistry and industrial hygiene laboratory.

Mrs. Federline's broad experience has been recognised internationally including service as Chairperson of the OECD/Nuclear Energy Agency Radioactive Waste Management Committee and Chairperson of the Halden Management Board.

Luis E. ECHÁVARRI

Mr. Echávarri, who is of Spanish nationality, was born in 1949 in Bilbao, Spain. Mr. Echávarri obtained Masters Degrees from the Superior Technical School of Industrial Engineering of Bilbao University and from the Faculty of Information Sciences of the Complutensis University of Madrid. He obtained a post-graduate degree in Management from the Industrial Organization School of Madrid, and is a Fellow of the College of Industrial Engineers of Madrid.

Mr. Echávarri began his career as an engineer in Bilbao and in 1975 joined Westinghouse Electric in Madrid. He went on to become Project Manager of the Lemoniz, Sayago and Almaraz nuclear power plants, for Westinghouse, in Spain. In 1985 Mr. Echávarri became Technical Director of the Spanish Nuclear Safety Council (CSN). He was named Commissioner of the CSN in 1987, a position which requires the approval of the Spanish Parliament.

In July 1995, Mr. Echávarri became Director-General of the Spanish Nuclear Industry Forum, a post held until July 1997, when he was appointed Director-General of the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD).

María-Teresa ESTEVAN BOLEA

Industrial Engineer at the Polytechnics University of Barcelona. Degree of High Specialisation in Weld and Environmental Engineering. She belongs to the Body of Industrial Engineers of the State. She has worked in companies of Engineering and Construction and Assembly of Cement Factories, Chemical Plants, Refineries, Thermal Power Stations, Oil and Gas Pipelines. She has also worked in Power Planning, in Power Technologies, Thermal Power Stations and Nuclear Energy.

She has been Advisor of the National Commission of Energy. President of the National Council of Industry and Energy (Ministry of Industry and Energy). Deputy of the European Parliament.

Member and Spokesperson at the Commissions of Energy, Technological Research and Development and Environment. Deputy of the Spanish Congress of Deputies, Spokesperson for Energy and Environment matters. General Director for Environment and Secretary General of the Inter-ministerial Commission of Environment from the Ministry of Public Works (1979-1982) and General sub-Director at the Ministry of Public Works (1977-1978). She has worked in the General Directorate of Energy: Hydrocarbon and Gas Departments, Subdivision of Power Planning of the Ministry of Industry and Energy, and at the Subdivision of Industrial Contamination of the Ministry of Industry and Energy. In July, 2001 she was appointed President of the Spanish Nuclear Safety Council (CSN).

Antonio COLINO

Antonio Colino was born in Madrid (Spain) in 1946 where he later gained his Ph.D. in Civil Engineering. He has devoted his professional career to the electricity and nuclear field. He has worked at Bechtel Power Corporation in California (USA), Westinghouse (USA) and ENDESA, a Spanish Electrical Company, before being appointed Chairperson and Chief Executive Officer of ENRESA, the Spanish National Company for the Radioactive Waste Management, in 1996.

As ENRESA's Chairperson, he was the first Chairperson of the International Association for the Environmental Disposal of Radioactive Waste, EDRAM, and is a member of several high level advisory groups of the IAEA and the European Commission on Nuclear Energy.

He is also a member of the Board of the Spanish National Research Centre for Energy, Environment and Technology (CIEMAT).

THE SPANISH DECOMMISSIONING SCENE

José REVILLA

José. L. Revilla graduated as a chemical engineer in the Basque Country University (Spain). He began his work as a civil servant in 1987 for the technical staff of the CSN (Spanish Nuclear Safety Council). From the beginning of his professional career in CSN till 1996 he belonged to the Radioactive Waste Branch of the CSN as an inspector in charge of controlling and regulating the generation and management of solid radioactive waste in the different Spanish Nuclear Power Plants and others nuclear facilities. He has participated in the licensing process of the "El Cabril", the low-level radioactive waste repository in Spain. Since 1996 till 1999 he was in charge of inspecting the spent fuel pools of the Spanish Nuclear Power Plants and the pre-licensing process for centralised interim storage facilities for spent fuel and also for the final geological disposal concept.

Since the beginning of 1999 he is in charge, as a Project Manager, of the Decommissioning Program of Vandellós-I NPP, the first Spanish Nuclear Power Plant being decommissioned.

Paloma SENDIN

Mrs. Paloma Sendin graduated as an Economist at the Autonomous University of Madrid in 1974. Mrs. Sendin entered in 1983 the National Body of Economists and Trade Technicians as a Civil Servant.

During her career, Mrs. Sendin was appointed Director General for Exports Promotion for the Spanish Institute for the Promotion of Foreign Trade (ICEX) from 1990 to 1994, Senior Advisor at the Prime Minister's Office for the Organisation Committee of the Spanish Presidency of the EU Council from 1994 to 1996, and Director General for Mining at the Ministry of Industry and Energy from 1996

to 2000. Since the beginning of the year 2000, Paloma Sendin is Commissioner for the Nuclear Regulatory Commission of Spain (“Consejo de Seguridad Nuclear”).

Mrs. Sendin is author of many articles and publications in specialised media and lectures at Conferences in the fields related to her professional background and experience. She has also been a member of several Executive Boards.

Javier Arana LANDA

Javier Arana Landa is an Industrial Engineer who completed his studies at the Superior Technical School of Industrial Engineering of Bilbao University in 1975.

From 1975 to 1986, he worked for SENER and INITEC architect engineering companies, dealing with the start-up of several nuclear projects as well as energy projects, particularly in relation to design and construction.

In 1985 he joined in the Spanish Administration, holding several positions in the Direction General for Energy. Since 1997, he became Deputy Director General for Nuclear Energy for the department of the Ministry of Economy, responsible for all nuclear energy subjects, including the follow up of decommissioning activities from technical and economic standpoints.

During his career, Mr. Landa has participated in many international committees and working groups hosted by international organisations in different areas related to nuclear energy.

José M. GRÁVALOS LASUEN

A graduate in Physics by the University of Zaragoza, Mr. Grávalos began his professional career in the Department of Nuclear Calculations of SENER. He subsequently worked at INTECSA, where he reached the post of Head of the Energy Division. Since 1985 he has been working at ENRESA, where he initially held the post of Head of the Engineering Department. In 1995 he was appointed as Director of Operations and Projects, the post that he occupies today. He is a member of the Board of Directors of Cassioppe, the Consortium of European Waste Management Agencies and several national and overseas professional associations. Mr. Grávalos is also the author of numerous articles and publications.

César DOPAZO

César Dopazo graduated in Aeronautical Engineering (AE) at Madrid Technical University (UPM). He holds a Ph.D. in Mechanical Engineering from the State University of New York and a PhD in AE from UPM. Dr. Dopazo has devoted most of his professional career, as a scientist at Brookhaven National Laboratory (BNL) and as Professor of Zaragoza University, to teaching, research and technological development in the fields of combustion, pollutant dispersion and industrial aerodynamics and hydrodynamics, with a significant number of international publications.

Dr. Dopazo has acted as a consultant to UNESA, BNL and United Technologies Corp. He has been a representative of some Spanish Ministries in EC Programmes and international organizations. He is member of the Royal Academy of Engineering of Spain and of several scientific and engineering societies. Since January 2002 he is General Director of CIEMAT (Research and Technological Development Center on Energy and the Environment) of the Spanish Ministry of Science and Technology.

Mariano Vila d'ABADAL

Mariano Vila d'Abadal is a lawyer with training from the University of Barcelona. He graduated in institutional relations and public management of the European Union in the European Centre Public Affairs Brussels (Templeton College, Oxford). He has a masters in Local Administration for the Independent University of Barcelona.

Mariano Vila d'Abadal is General Secretary of the Association of Nuclear Municipalities of Spain (A.M.A.C) since 1988. He is General Secretary of the Group of European Municipalities with Nuclear Facilities (GMF) since 1999.

He is also a lawyer in the office "M.B. Advocats Associats", with specialisation in Administrative, Environmental and City-Planning issues with emphasis on administrative questions related to the nuclear power plants.

INTERNATIONAL STOCKTAKING

Ernst WARNECKE

University education in chemistry at the Universities of Hanover and Heidelberg.

R&D work on waste minimisation in the reprocessing of spent fuel by the application of electrolytic methods at the Nuclear Research Centre Karlsruhe.

Ph.D. with a thesis in Nuclear Chemistry at the University of Heidelberg.

Development of repositories for radioactive waste at the Federal Office for Physics and Technology, Braunschweig/Federal Office for Radiation Protection, Salzgitter.

Development and application of international safety standards for radioactive waste management at the International Atomic Energy Agency, Vienna.

Decommissioning of nuclear facilities at the Federal Office for Radiation Protection, Salzgitter.

Ingemar LUND

Ingemar Lund was born in Sweden. In 1985 he gained his Ph.D. in High Energy Nuclear Physics in Lund, Sweden. During 1985-1992 he worked with research, high energy physics, at Conseil Européen pour la recherche nucléaire (CERN), France/Switzerland.

In 1992, Ingemar Lund joined the Swedish Radiation Protection Authority, SSI, working with issues connected to Occupational Exposure. Further to this he also co-ordinates SSI's work with decommissioning issues.

Gordon LINSLEY

Gordon Linsley has a B.Sc. in physics and a Ph.D. in solid state physics both awarded by the University of Sheffield in the United Kingdom. He was a staff member of the United Kingdom's National Radiological Protection Board (NRPB), from its inception in 1970 until 1984. During a period as a radiation protection advisor, he acquired a broad experience in relation to safety in the uses of ionising radiations in industry, research and medicine. From 1976, the focus of his work changed to

environmental impact assessment and subsequently, he led a group at NRPB, which carried out several important impact assessments including the first comprehensive assessment of the 1957 Windscale Fire.

In 1984, he joined the International Atomic Energy Agency (IAEA), Vienna, Austria, to lead a group concerned with the environmental aspects of radioactive waste management, safety assessment and radiological criteria for application to waste management. Since 1996, he has been Head of the Waste Safety Section at the IAEA. This section is responsible for establishing international safety standards for radioactive waste management and providing for their application. He has been involved in the international activities concerned with establishing guidance on exemption and clearance since the mid-1980s.

José Antonio HOYOS PÉREZ

José Antonio Hoyos Pérez, currently works as a principal Administrator in the European Commission Directorate-General for Energy and Transport for Nuclear Energy, Decommissioning of Nuclear Installations.

He gained a M.Sc. Nuclear Power Engineering (Polytechnic University, Madrid), and a Masters in Enterprise Organisation (ICADE).

He has also worked in the Spanish Navy as an Engineer Officer, in a Nuclear Power Plant, Reactor, BOP, ISI engineering and also in Private industry, in Management of nuclear technology and services supply (waste management, inspection technologies. Further to this he has worked in EC DG TREN, Nuclear Safeguards Directorate (Fuel reprocessing installations) and EC DG Enterprise (Innovation Programme, Energy Technologies).

Manuel D. IBÁÑEZ

After, graduating as an Industrial Engineer from the Polytechnic University of Barcelona, Manuel Ibáñez joined FECSA (Electrical Utility now part of the ENDESA Group) and then went on to train with Westinghouse, USA where he obtained a SRO certificate.

During his career, Mr. Ibáñez has worked as Technical Superintendent and later, Operations Superintendent of Ascó I and II NPP, he then in 1986 joined UNESA (Spanish Electricity Industry Association) and between 1990-1992 he became Liaison Engineer of the Spanish Electricity Sector at INPO. During the period 1993-1995 he was Team Leader of the European Commission TACIS Programme "On-site Assistance to South Ukraine NPP".

In 2001, Manuel Ibáñez was promoted to Nuclear Affairs Department Manager of UNESA where he is currently working.

Manuel Ibáñez is also a representative of UNESA at the International Participants Advisory Committee (IPAC) of INPO and WANO Interface Officer (WIO) with WANO Paris Centre. Further to this is also a member of the Spanish Nuclear Society and of the Latin American section of the American Nuclear Society as well as Member of the Nuclear Working Group of EURELECTRIC He also collaborates with the IAEA and Spanish Nuclear Industry Forum and is professor of the Nuclear Energy Master Course of the CIEMAT (Spanish National Research Center).

SESSION I: GAS/GRAPHITE REACTORS

Vincent MASSAUT

Vincent Massaut holds a Master of Science in Engineering, with a specialisation in Nuclear Science from the University of Liège. He has been involved for several years in accelerated irradiation of fusion reactor materials and in robotics for the nuclear environment.

Involved since 1989 in the project of Decommissioning the BR3 PWR reactor (pilot project of the European Commission) as an assistant to the project leader, he became project leader at the end of 1992. He is now leading the department of international relations within the waste and clean-up division at SCK•CEN.

He lectures on decommissioning nuclear installations at the University of Liège. He was designated several times as expert for the IAEA concerning problems related to dismantling, decontamination and restoration of sites and is a member of different international committees on decommissioning and decontamination.

Alejandro RODRÍGUEZ

Alejandro Rodríguez is a Nuclear Engineer, and Risk Analysis Master. During several years, he was involved in design and construction of NPP and from 1991 he started working for ENRESA as a Project Manager of Vandellós-I NPP Decommissioning, and from 1998, he has been Technical Manager of the project on site.

He has been a lecturer on different courses related to nuclear energy and radioactive waste, he is a member of different international groups related to decommissioning and waste management and he has published diverse articles on these topics.

Paul B. WOOLLAM

Paul Woollam is a nuclear physicist who graduated from the University of London. He started researching reactor decommissioning issues in 1975 and presented a paper to the first international decommissioning conference held in Vienna in 1978, organised by IAEA.

Over the next 25 years Dr. Woollam became heavily involved with reactor decommissioning and particularly with policy, strategy, safety and radioactive inventory matters.

Paul was a member of the Oversight Committee supervising the world's largest reactor decommissioning project at Fort St. Vrain in Colorado. The only non-American associated with this project, his role was to advise the plant's owners on the safety implications of the work. He has also presented evidence to USNRC hearings on decommissioning rule-making and is on the Decommissioning Executive Committees of both EPRI and ANS. Over the past two years he chaired the OECD/NEA Expert Group on decommissioning policies, strategies and costs. He recently gave evidence to the UK's first Public Inquiry related to a reactor decommissioning project.

Dr. Woollam is currently Decommissioning Manager with British Nuclear Fuel's Magnox Generation Business.

He is married with two daughters and lives in the Cotswold Hills in England.

Tadamichi SATOH

Tadamichi Satoh graduated from the University of Hokkaido (Nuclear Engineering) and entered The Japan Atomic Power Company in 1974.

Between 1974-1994 Tadamichi Satoh has worked in Radioactive Waste Management and Health Physics, Public Acceptance on Radiation Safety and Environment Radiation Safety (9 years).

From 1994-2003, he worked in Decommissioning Planning and Preparing Works for Tokai-1 Project.

Tadamichi Satoh is currently the General Manager, for the Decommissioning Project Department, in the Japan Atomic Power.

SESSION II: LIGHT WATER REACTORS

Luigi NOVIELLO

After gaining his electrotechnical Engineering with honours, in 1964 at the University of Rome, Luigi NovIELLO was engaged by ENEL (Ente Nazionale Energia Elettrica) in the Engineering Division. He was involved in the start-up, automation tests and installations of several Thermal power plants as well as the start up of process computers in NPP.

As manager of the Nuclear Engineering Division at ENEL, he coordinated the bid evaluation for the fifth NPP of ENEL and was involved in the development of Nuclear Standard Plant (PUN). He was further assigned to the Nuclear Systems Branch of the Engineering Division and became active in the setting of the PWR standard plant (PUN) national policies.

In 1991 responsibilities were assigned to him in the European initiative (EUR) and he was appointed Chairman of the EPP Steering Committee, the joint project of Westinghouse and 7 European Utilities to adapt the AP600 design to EUR. He was appointed Director for the Engineering unit, responsible for decommissioning strategy for Italian NPPs.

Currently Luigi NovIELLO is the Director of Quality Assurance Department of SOGIN and also a member of the S.C. of the Consortium for the decommissioning of the Italian fuel cycle facilities. He has been with SOGIN (former ENEL NPP management) for 37 years.

Klaus SCHIFFER

Dr. Klaus Schiffer is head of the decommissioning department in EON Kernkraft GmbH, one of the major utilities in Germany. Since 1995, he has been involved in licensing and planning of upgrades of nuclear power plants, operation of boiling water reactors, conceptual planning and licensing of decommissioning for the nuclear power plant in Würgassen. He has also been involved in the same activities since 2001 in Stade.

After gaining his PHD at the University of Cologne in nuclear physics and nuclear chemistry, he went on to work at the Nils Bohr Institut Copenhagen for 2,5 years and then at the Australian National University in Canberra for 2 years.

Ján TIMULÁK

Ján Timulák completed his Master of Science in Chemical Engineering and Doctor of Philosophy in Nuclear Chemistry at the Slovak Technical University of Bratislava in 1974 and 1983 respectively.

Currently Ján Timulák is the director for the Decom Slovakia, spol. s r.o. and is actively involved in the management of engineering work in the field of NPP decommissioning, radioactive waste and spent fuel management. He is responsible for deep disposal development in the Slovak Republic.

Prior to 1993, he has gained experience in Engineering work in the field of chemical engineering as well as the measurement of radioactivity in surface waters. He has also worked in the field of research of radioactive waste management – solidification of liquid waste.

Ján Timulák is a member of the Slovak Nuclear Society. He speaks several languages fluently and is married.

Håkan STERNER

Håkan Sterner is Project Leader Conceptual Planning and International Projects at the Energiewerke Nord GmbH (EWN). He started in the nuclear business 30 years ago in the Research Center Studsvik in Sweden, continued in the Eurochemic reprocessing plant in Mol in the waste management area and worked subsequently by the Engineering company Noell in Germany with the design of a plant for conditioning of fuel elements in view of direct disposal. Since 1992 he has been with Energiewerke Nord in the decommissioning project of the Russian WWER reactors. Present responsibilities include all international activities, conceptual planning and IT-systems. Presently he is also Project Manager for the decommissioning project AVR, i.e. the High Temperature Pilot Reactor at the Research Center site.

SESSION III: NATIONAL STRATEGIES

Stan GORDELIER

Stan Gordelier is a Fellow of the Institute of Mechanical Engineers and the Institute of Nuclear Engineers. He graduated in mechanical engineering and joined the nuclear power generation industry, working in research and development for the Central Electricity Generating Board in the UK.

He spent the first 10 years of his career in nuclear R&D, the second 10 years in technical support for operating nuclear plant and, when the first commercial reactor in the UK moved into decommissioning, took up a full time role in radioactive waste management and decommissioning and has stayed in that field ever since. During his career he had worked for the CEGB, Nuclear Electric, Magnox Electric, BNFL and is now the Director of Southern Division of the UKAEA, responsible for the decommissioning programmes on three major sites.

Marnix BRAECKEVELDT

In 1985, Marnix Braeckeveldt graduated as an Industrial Engineer in Nuclear Energy. He then completed his Master of Safety Techniques in 1990 and in 1996 gained a Master of Science in Nuclear Engineering.

He began his nuclear career in 1986 at Belgonucleaire as Deputy Chief Safety section at the MOX-fuel fabrication facility in Dessel. This nuclear career continued in 1990 when he became responsible for elaborating radioactive waste acceptance criteria and specifications at the National Agency for Radioactive Waste Management (NIRAS/ONDRAF).

In 1994, Marnix Braeckeveldt entered the field of decommissioning and became contract-manager in charge of the follow up of the decommissioning activities at the nuclear research centre SCK•CEN in Mol, these activities are financed by a fund managed by NIRAS/ONDRAF. The most important ongoing activities cover, amongst others, the decommissioning of the BR3-nuclear reactor. Within these responsibilities, he became the project-manager for the dry storage project of the BR3 spent fuel.

As well as a member of several international organisations, Marnix Braeckeveldt is a member of the Board of Mols Overleg Nucleair Afval “(MONA)”.

Ivo TRIPPUTI

Ivo Tripputi is a nuclear engineer, who since 1973 has been involved in the design and operations of Nuclear Power Plants mainly inside the Italian utility ENEL.

After the closure of all Italian NPP's after Chernobyl, in the 90s he participated in the development of the utility requirements for a new generation of reactors, both in the US at EPRI and in Europe in the EUR organisation. In the last organisation he was responsible for the safety requirements and the Containment system requirements.

More recently, after SOGIN was created for the decommissioning of all nuclear installations in Italy, he took the responsibility for the Interim storage of all spent fuel.

Since February 2003, he is the Director of the SOGIN Department for the Decommissioning of the Nuclear Fuel Cycle Installations.

Dominick A. ORLANDO

Mr. Orlando's experience in the field of radiation safety and radioactive and chemical waste management spans 17 years and includes work in research, private consulting and service with the Federal government. Currently, he is a Technical Assistant in NRC's Decommissioning Branch, in the Office of Nuclear Material Safety and Safeguards. In this position he is responsible for the review, evaluation and co-ordination of all technical, policy and administrative issues within the Decommissioning Branch and is the principal advisor to the Branch Chief in these areas. Prior to his assuming his current position, he was a Project Manager in the Decommissioning Branch where his principal responsibilities included development and co-ordination of NRC's regulatory policies and positions on mixed waste and Superfund issues, source material issues, and the development guidance for decommissioning and radioactive waste management. In addition, he has been the project manager for the decommissioning of several materials, fuel cycle, and non-power reactor facilities.

He earned a Bachelors of Science degree from St. Mary's College of Maryland in 1979. He currently lives in Catonsville, Maryland with his wife and two daughters.

Jean-Jacques GRENOUILLET

Jean-Jacques Grenouillet is a graduate engineer in Mechanics and Microtechniques and he has got a Master of Science degree in Mechanics.

He has been working with Électricité de France since 1982 always in the field of nuclear energy. He started his career within the Nuclear Operation Division of EDF where he was first involved in the commissioning of Saint-Alban NPP (2 x 1 300 MW units) from 1982 to 1986. He then held different positions on several NPPs or at corporate levels where he was responsible for the implementation of modifications and improvements on EDF power plants. In 1988 he joined EDF Engineering Division where he was responsible for the development of EDF nuclear engineering activities in Eastern and central Europe. At that same time he started to be involved in the development of several decommissioning projects in Central Europe and he is currently responsible for the development of EDF activities in the field of decommissioning and radwaste management outside France.

SESSION IV: OTHER FUEL CYCLE FACILITIES

Guy DECOBERT

Guy Decobert is currently working for AREVA/COGEMA Reprocessing Business Unit. Prior to this he was involved in decommissioning expertise inside COGEMA, he was in charge of the construction of 2 laboratories on La Hague site (an on-site laboratory for EURATOM and a laboratory for the new plutonium fabrication facility). Further to this he is managing projects dealing with decommissioning such as; the development of a cost evaluation methodology for reprocessing plants decommissioning; the Research and Development programme with CEA (the French Atomic Energy Agency) concerning new processes for decontamination knowledge management on decommissioning inside his business unit.

He has been a member of TAG since 2001.

Tim MILNER

Tim Milner has over 19 years experience of research and development with 14 years being in the area of nuclear decontamination, decommissioning and waste management. He is the Technical Manager in BNFL Inc for the D&D Operations Group at the West Valley Demonstration Project in Western New York. In addition he supports the Big Rock Point Reactor D&D project in Michigan, and the Three Building D&D Project at the East Tennessee Technology Park.

Prior to moving to BNFL Inc Tim was employed by BNFL at its Sellafield site in the UK where he worked in Research and Technology, specializing in the development and application of chemistry and chemical processes in support of decontamination and decommissioning, waste treatment and disposal of nuclear waste in the UK, Europe and USA. He is cited as inventor of numerous patents in D&D technologies and has produced articles and technical papers on a wide range of D&D related topics. Tim is a Chartered Chemist and Member of the Royal Society of Chemistry

Helmut RUPAR

Dr. Helmut Rupar was born in Graz (Austria) in 1942 and has remained an Austrian citizen although he has lived over 30 years in Germany. He studied in Vienna Technical Physics. Thereafter he was employed by Belgonucléaire (Belgium) and by Siemens AG (Germany). He started his career

with development and design of fuel for breeders and thermal reactors. He continued to sell fuel reloads for Non-Siemens nuclear power plants all over the world and to provide the relevant services.

Presently he is responsible for decommissioning of four Siemens owned fuel cycle facilities in Hanau and Karlstein (Germany).

Thorsten SCHWARZ

Thorsten Schwatz complete his degree in Aerospace Engineering at the University of Stuttgart in 1995, and has worked for years in several functions in the Aerospace Industry including Marketing and Business Development. In 2000 he changed to RWE Solutions AG, the engineering service arm of the German Utility RWE (and parent of the current Employer RWE NUKEM GmbH), where he was promoted to Vice President for Marketing and Sales Coordination. Since February 2003 he is General Manager for Western Europe with RWE NUKEM GmbH. RWE NUKEM which is one of the leading European contractors for nuclear engineering, specialised in Waste Management and Decommissioning Solutions.

Kevin HAYES

Kevin Hayes possesses an Associate of Science in Manufacturing Engineering and a Bachelor of Science in Industrial Technology. Mr. Hayes has fifteen years of experience in the nuclear fuel industry, during which time he has been responsible in areas of environment, health and safety.

Currently, he is Environment, Health & Safety Manager, his responsibilities include providing leadership for meeting Westinghouse Hematite Site D&D Project goals and continually improving Project performance regarding environmental protection and occupational health and safety. Mr. Hayes manages radiological and non-radiological regulatory compliance, security, emergency preparedness, and community relations at commercial nuclear fuel cycle facilities.

Previously Mr. Hayes has worked as a program manager for non-radiological regulatory compliance, as a Site Safety Coordinator and a security officer. His experience has also included security and emergency services, as well as coordination of site environmental programs.

SESSION V: SOCIAL ASPECTS

José CASTELLNOU

José Castellnou is a chemical analyst technician. From 1987 to 1997 has been member of the town council of the municipality of Vandellós, a town with two nuclear power plants. He was elected as Mayor of this municipality in 1997.

Philip MODING

Philip Moding, is currently the secretary of the Swedish network for municipalities hosting nuclear facilities, where he has been since 1977. He also works as a private consultant (KAAB Prognos AB, Sweden.).

He has a long background in Swedish radioactive waste management issues such as Secretary general to the Swedish parliamentary committee on the management of radioactive waste from 1973-76 and creating the strategies for waste management, many of these are still valid. Mr. Moding has a Licentiate in Geography and Physical planning.

Larry KRAEMER

Larry Kraemer was educated in Toronto and was elected as Mayor of Municipality of Kincardine in November 2000. His current responsibilities as well as mayor is, is as counsellor for the county of Bruce.

He was also the first Chairman of Canadian Association Nuclear Host Communities (CANHC) as well as first Chairman Kincardine Centre for the Arts) and currently is Chairman of the Board of Bruce Municipal Telephone Company and Bruce County Library Board with 18 branches. He is an avid reader, his primary interests are History, politics, Sciences and Psychology.

Allan DUNCAN

Allan Duncan graduated from Oxford University in 1966 and worked in cryogenic engineering in the US for three years. He then spent ten years with the UK Atomic Energy Authority in nuclear chemical engineering and nuclear waste management. Since 1979 he has been involved in environmental regulation, including nuclear waste disposal. He was Chief Inspector of Her Majesty's Inspectorate of Pollution and, subsequently, Head of Radioactive Substances Regulation in the Environment Agency, formed in 1996.

Throughout his career he has participated in the work of the OECD Nuclear Energy Agency, the International Atomic Energy Agency and the European Commission. Since retiring in 2000, he has continued as a member of the EURATOM Scientific and Technical Committee and as a member of the Nirex Waste Management Advisory Committee. He now acts as an independent environmental advisor and has supported the NEA in the areas of nuclear facility decommissioning and regulation of radioactive waste management.

LIST OF PARTICIPANTS

BELGIUM

BLOMMAERT, Walter	Federal Agentschap voor Nucleaire Controle (FANC)
BRAECKEVELDT, Marnix	National Organisation for Radioactive Waste and Fissile Materials (ONDRAF/NIRAS)
DEBOODT, Pascal	Centre Études Nucléaires (CEN•SCK)
MASSAUT, Vincent J.	Centre Études Nucléaires (CEN•SCK)

CANADA

FUNDAREK, Peter	Canadian Nuclear Safety Commission (CNSC-CCSN)
KRAEMER, Larry	Canadian Association of Nuclear Host Communities Representative
METCALFE, Doug	Natural Resources Canada (NRCAN)

CHINESE TAIPEI

LIN, Li-Fu	Institute of Nuclear Energy Research (INER)
------------	---

CZECH REPUBLIC

DAVIDOVA, Ivana	CEZ
-----------------	-----

FINLAND

PATRAKKA, Eero	Teollisuuden Voima Oy (TVO)
WIKSTROM, Nils-Christian	POSIVA OY

FRANCE

CANAFF, Yves	WANO – Paris Centre
CHAPALAIN, Estelle	DGSNR
DECOBERT, Guy	AREVA/COGEMA
FRANÇOIS, Patrice	IRSN

GRENOUILLET, Jean-Jacques

EDF/CIDEN Cedex

NOKHAMZON, Jean-Guy

CEA/DEN/DPA

GERMANY

ANSPACH, Walter

RWE NUKEM GmbH

RUPAR, Helmut

SIEMENS AG

SCHIFFER, Klaus-Jurgen

E.ON Kernkraft GmbH

SCHWARZ, Thorsten

RWE NUKEM GmbH

STERNER, Håkan

Energiewerke Nord GmbH (EWN)

THIERFELDT, Stefan

Brenk Systemplanung

VALENCIA, Luis

Forschungszentrum Karlsruhe GmbH (FZK)

WARNECKE, Ernst

BfS

ITALY

MADONNA, Antonio

APAT

NOVIELLO, Luigi

SOGIN

STURVI, Massimo

SOGIN

JAPAN

SATOH, Tadamichi

Japan Atomic Power Company (JAPC)

SHIMADA, Taro

Japan Atomic Energy Research Institute (JAERI)

YANAGIHARA, Satoshi

Japan Atomic Energy Research Institute (JAERI)

NORWAY

BOE, Trond

Institute for Energy Technology (IFE)

ROMANIA

MIRCEA, Mariana

GMF

SLOVAK REPUBLIC

BLAZEK, Josef

SE-VYZ

HORVATH, Ján

SE-VYZ

SWEDEN

BERGLUND, Thomas	Swedish Nuclear Power Inspectorate (SKI)
BERGSTROM-OLSSON, Lena	Studsvik RadWaste AB
CARLSSON, Jan	Swedish Nuclear Fuel and Waste Management Co. (SKB)
ERIKSSON, Anders	Studsvik Radwaste
JOHNSSON, Borje	Studsvik Radwaste AB
LUND, Ingemar	Swedish Radiation Protection Authority (SSI)
MENON, Shankar	Menon Consulting
MODING, Philip	KSO & GMF
PALMQVIST, Roland	Mayor / Vice President of GMF

SWITZERLAND

MAXEINER, Harald	National Cooperative for the Storage of Radioactive Waste (NAGRA)
------------------	---

UNITED KINGDOM

BARLOW, Stephen	UK NIREX LTD
DUNCAN, Allan	Consultant
GORDELIER, Stanley	United Kingdom Atomic Energy Authority (UKAEA)
TAYLOR, Frances	Health & Safety Executive, Nuclear Safety Directorate
WOOLLAM, Paul B.	BNFL

UNITED STATES OF AMERICA

FEDERLINE, Margaret V.	US Nuclear Regulatory Commission (NRC)
HAYES, Kevin	Environmental Health and Safety
MILNER, Tim	BNFL Inc.
ORLANDO, Dominick	US Nuclear Regulatory Commission (NRC)

International Organisations

BONNE, Arnold

International Atomic Energy Agency (IAEA)

LINSLEY, Gordon S.

International Atomic Energy Agency (IAEA)

HOYOS PÉREZ, José A.

European Commission (EC)

ECHÁVARRI, Luis

OECD Nuclear Energy Agency

PESCATORE, Claudio

OECD Nuclear Energy Agency

RIOTTE, Hans

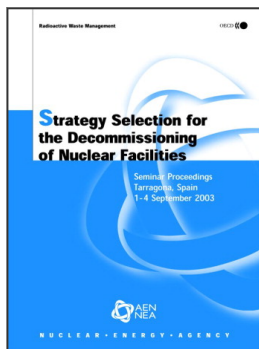
OECD Nuclear Energy Agency

TABLE OF CONTENTS

FOREWORD	3
<i>Allan Duncan, Claudio Pescatore, Margaret Federline</i> Overview of lessons learnt	9
OPENING SPEECHES	13
<i>Luis Echávarri</i>	15
<i>María-Teresa Estevan Bolea</i>	19
<i>Antonio Colino</i>	25
THE SPANISH DECOMMISSIONING SCENE	29
<i>Paloma Sendin</i> The regulator's view.....	31
<i>Javier Landa</i> Decommissioning and dismantling policy in Spain	37
<i>José M. Grávalos</i> The implementer's view	43
<i>César Dopazo</i> The R&D view	49
<i>Mariano Vila d'Abadal</i> Social aspects of decommissioning and dismantling in Spain	53
INTERNATIONAL STOCKTAKING	65
<i>Ingemar Lund</i> Decommissioning of nuclear power plants: policies, strategies and costs	67
<i>Gordon Linsley</i> Findings of the international conference on safe decommissioning for nuclear activities.....	71
<i>José A. Hoyos Pérez</i> A European perspective on the funding of decommissioning and related activities of the end of the nuclear cycle.....	77
<i>Manuel Ibáñez</i> Views of plant operators – Work done at EURELECTRIC and EUR	85

STRATEGY SELECTION ANALYSIS BY PLANT TYPE	95
SESSION I: GAS/GRAPHITE REACTORS	97
<i>Alejandro Rodríguez</i> Vandellós, Spain, (safe enclosure)	99
<i>Paul B. Woollam</i> UK reactor decommissioning strategy	103
<i>Tadamichi Satoh</i> Tokai-1 decommissioning project	115
SESSION II: LIGHT WATER REACTORS	121
<i>Klaus Schiffer</i> The decommissioning strategy for the Stade nuclear power plant	123
<i>Ján Timulák</i> NPP decommissioning documentation preparation.....	129
<i>Håkan Sterner and Dieter Rittscher</i> The Greifswald WWER decommissioning project: strategy selection	149
SESSION III: NATIONAL STRATEGY (IES)	155
<i>Marnix Braeckeveldt</i> Lessons learnt in establishing a first national inventory of decommissioning liabilities in Belgium	157
<i>Luigi Noviello and Ivo Tripputi</i> Decommissioning strategy for NNPs and other nuclear facilities in Italy	161
<i>Dominick A. Orlando</i> Decommissioning strategies being implemented in the USA	175
<i>Jean-Jacques Grenouillet</i> EDF decommissioning programme: a global commitment to safety, environment and cost efficiency of nuclear energy.....	181
SESSION IV: OTHER FUEL CYCLE FACILITIES	187
<i>Guy Decobert, C. Georges and B. Vignau</i> The UP1 decommissioning programme at the COGEMA-MARCOULE site strategic approach.....	189
<i>Timothy N. Milner and Stuart MacVean</i> Decontamination and decommissioning at the West Valley Demonstration Project	195
<i>Alain Ensuque and Jean-Guy Nokhamzon</i> Decommissioning strategy for Brennilis France	203
<i>Helmut Rupar and Thorsten Schwarz</i> Decommissioning of six German fuel cycle facilities.....	205

<i>Kevin Hayes</i>	
Hematite nuclear fuel cycle facility decommissioning.....	209
SESSION V: SOCIAL ASPECTS	215
<i>Paul B. Woollam</i>	
Experience from the Trawsfynydd public inquiry.....	217
<i>Josep Castellnou</i>	
Local information committee and social repercussions of the closure and dismantling of Vandellós-I.....	223
<i>Kevin Hayes</i>	
Groundwater contamination and community relations.....	227
<i>Philip Moding</i>	
Some expectations from European municipalities hosting nuclear facilities	233
<i>Larry Kraemer</i>	
Community expectations.....	235
FINAL PLENARY DISCUSSION	
<i>Moderator: Margaret Federline</i>	245
BIOGRAPHICAL SKETCHES	253
List of participants	267



From:

Strategy Selection for the Decommissioning of Nuclear Facilities

Seminar Proceedings, Tarragona, Spain, 1-4 September 2003

Access the complete publication at:

<https://doi.org/10.1787/9789264016729-en>

Please cite this chapter as:

OECD/Nuclear Energy Agency (2004), "Overview of Lessons Learnt", in *Strategy Selection for the Decommissioning of Nuclear Facilities: Seminar Proceedings, Tarragona, Spain, 1-4 September 2003*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264016729-2-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.