

Nuclear Decommissioning Services

Principal Contacts:

Dr. Daniel A. Galson, Dr. Stephen M. Wickham

Head office

5 Grosvenor House, Melton Road, Oakham, Rutland LE15 6AX

Tel: (01572) 770649

Fax: (01572) 770650

Email: info@galson-sciences.co.uk

Web: www.galson-sciences.co.uk

General

Galson Sciences Limited (GSL) provides a range of nuclear decommissioning services to an international clientele. Key work areas include: risk and impact assessment studies; decision analysis and options studies for decommissioning; radioactive waste management including inventory audits and waste conditioning, packaging, transport, storage and disposal studies; geosciences; nuclear safety; and risk management and communication. The company was founded in 1992.

Principal Nuclear Decommissioning Service Areas

- **Decision analysis, Best Practicable Environmental Option (BPEO), and Best Practicable Means (BPM) studies**
 - Reactor decommissioning
 - Boiler decommissioning
 - Reactor building clearance
 - Legacy waste facility (ponds / silos) remediation and decommissioning
 - Concrete, metal, graphite, organic liquid and active waste water management
 - Contaminated land management and Site End Point determination

- **Lifecycle management of LLW, ILW, HLW, Spent Fuel, U and Pu**
 - Development of site-wide Integrated Waste Strategies (IWS) for decommissioning
 - Decommissioning inventory estimation and audit
 - Active effluent management strategy during decommissioning
 - Effluent treatment plant operation
 - Solid waste treatment and packaging
 - Long-term and interim waste storage
 - Transport
 - Disposal, including development of lifetime plans

- **Management consulting** during reorganisation from power generation to decommissioning at nuclear power plants. Reviews of arrangements for waste management at decommissioning sites.
- **Cost forecasts and analyses**
- **Environmental risk and impact assessment** including radiological risk assessment
- **Risk management**, including management of project risks connected with the environmental impacts of decommissioning projects
- **Stakeholder engagement, risk communication and risk perception studies**, with emphasis on the communication of technical information to stakeholders and decision-makers
- **Information and document management**, including database development
- **Project management** of technically complex, multidisciplinary projects

Recent UK Project Experience

- British Nuclear Group/Magnox Electric/BNFL
 - **Integrated Waste Strategy.** We advised on development of the Sellafield IWS.
 - **Active waste water (AWW) management.** We compiled a site-wide AWW inventory for the Hinkley Point A decommissioning site and made forecasts of abatement requirements during the decommissioning programme. We reviewed arrangements for AWW management at Hinkley Point A. We evaluated the capability of the effluent treatment plants to cope with the forecast AWW arisings and made recommendations to improve plant capability.
 - **LLW inventory and management.** We reviewed the solid LLW at Hinkley Point A, and compared it with LLW inventories and LLW management strategies at other Magnox decommissioning sites (Hunterston A, Trawsfynydd and Berkeley). We provided LLW inventory estimates for different waste management strategies.
 - **Environmental Impact Studies.** We trained British Nuclear Group staff at Hinkley Point A on management of project risks connected with the environmental impacts of decommissioning projects. We prepared an interactive CD containing the original environmental study documents, summary documentation and hypertext links to underlying documentation.
 - **Boiler decommissioning strategy.** We conducted a multi-criteria options study for the complete removal and management of the boilers at the Trawsfynydd Decommissioning Site. and compared these options with the current baseline boiler decommissioning strategy.
 - **Legacy ponds and silos decommissioning.** We advised on the development of, and consulted on, a strategic BPEO study for clean-up of ponds and silos at the Sellafield site. We advised on and facilitated BPEO stakeholder workshops for the Magnox Wet Silo and Legacy Pond Solids projects.
 - **Disposal options for decommissioning wastes.** We have conducted preliminary assessments of disposal options for decommissioning wastes with very low levels of activity.
 - **Defuelling and decommissioning change management.** We identified and analysed change management issues from power generation to defuelling and decommissioning at Magnox power stations. The study was based on document reviews and interviews with management at Bradwell, Calder Hall and Hinkley Point A.
 - **ILW storage options.** We developed strategic and cost comparisons of alternative ILW management strategies.
 - **ILW store design and management.** We provided expert and secretariat services to a series of workshops on new Magnox ILW store designs, compiled the issues to be accounted for in store design, and developed strategies for ILW management.
 - **Compilation of a database of ILW storage facilities** and store operation procedures worldwide. We developed criteria for classifying and ranking store performance and identified successful waste management strategies for various types of waste package.
- UKAEA Windscale
 - **Broad-brush development of reactor decommissioning strategy.** We prepared and consulted on top-level BPEO studies of the management options for decommissioning Windscale Piles 1 and 2. The studies covered issues such as what and when to decommission, and how to manage resultant wastes. We conducted a BPM study for management of fuel and isotopes wastes.
 - **Development of optimised IWS.** We prepared and consulted on a BPEO study to support the development of an IWS for all decommissioning wastes arising at Windscale.

- UKAEA Dounreay
 - **BPEO for LLW management.** We performed a wide range of assignments for UKAEA as part of a five-year (BPEO) assessment contract including:
 - Risk assessment for LLW disposal, storage and transport.
 - Cost analysis for LLW disposal, storage and transport.
 - Review of LLW treatment and packaging options.
 - Development of site monitoring database.
 - Development of database of regulatory requirements.
 - Review and planning of site characterisation data and work programmes.
 - Preparation of non-technical presentational material for stakeholder consultation; planning for consultation and dialogue; facilitation and reporting of consultation.
 - **Development of safety cases for LLW disposal.** We are developing safety cases and preparing risk assessments for submission to regulators for authorisation of proposed new LLW disposal facilities to take wastes from decommissioning of the Dounreay site.
 - **Particles BPEO study.** We supported an options study and reviewed technical work conducted in support of the BPEO for radioactive particles in the marine environment.
 - **BPEO studies for Dounreay Site Restoration Strategy.** We supported the development of and/or consultation on BPEO studies for treatment of radioactive solvents and oils, fast reactor fuel management, shaft decommissioning, site-wide IWS, and site endpoint.
- Nirex
 - We evaluated **waste package longevity and condition monitoring** in storage facilities, and quality checking of packages.
 - We conducted an international review of radioactive waste immobilisation matrices.
 - We led the conduct of **criticality assessments**, including consideration of issues relating to criticality safety of a wide range of ILW packaging. We have conducted Letter of Compliance (LoC) assessments.
 - We have provided in house support for the Safety and Strategy Department, including support for the development of disposal concepts for HLW and SF, assessment of options for the disposal of Pu and U, and consideration of the waste implications from new build.
- Planning Inspectorate
 - **Trawsfynydd public inquiry.** Dr. Galson served as expert technical assessor supporting the Public Inquiry into the planning application for decommissioning Trawsfynydd power station.
- Nuclear Installations Inspectorate (NII)
 - We conducted an **international review of ILW storage**, monitoring, inspection and retrieval practices to identify “best practice”, and conducted **regulatory reviews** of UK ILW stores.
 - We reviewed **approaches to delicensing** and clearance criteria in OECD countries.
 - We are **reviewing safety cases** for the development of new ILW stores.
- Environment Agency
 - We acted as principal contractor for **regulatory review of BNFL’s safety case for continued disposal at the national LLW repository at Drigg**, including conduct of a probabilistic risk assessment.
- SNIFFER (Scottish and Northern Ireland Forum for Environmental Research)
 - We developed a methodology for determining **the radiological capacity of controlled landfill sites** to take solid LLW, and evaluated the acceptability of **dustbin disposals** of radioactivity from the non-nuclear industry.

Clients

United Kingdom

Nuclear Decommissioning Authority (NDA)
British Nuclear Group
British Nuclear Fuels Limited (BNFL)
Committee on Radioactive Waste Management (CoRWM)
Department for Environment, Food and Rural Affairs (DEFRA)
Environment Agency of England and Wales
Magnox Electric
Scotland and Northern Ireland Forum for Environmental Research (SNIFFER)
Scottish Environment Protection Agency (SEPA)
Planning Inspectorate
UK Health and Safety Executive (HSE) and UK Nuclear Installations Inspectorate (NII)
UK Department of Trade and Industry (DTI)
UK Department of Environment, Transport and the Regions (DETR)
UK Atomic Energy Authority (UKAEA)
UK Nirex Limited

Europe (non-UK)

Belgian National Radioactive Waste Management Company (ONDRAF/NIRAS)
French Nuclear Safety Authority (ASN)
Institute for Radiological Protection and Nuclear Safety (IRSN)
French National Radioactive Waste Management Company (ANDRA)
French Atomic Energy Commission (CEA)
Finnish National Radioactive Waste Management Company (POSIVA)
Swedish Nuclear Power Inspectorate (SKI)
Swedish Radiation Protection Institute (SSI)
Swiss National Radioactive Waste Management Company (NAGRA)

North America

Sandia National Laboratories (SNL), US Department of Energy (USDOE)
Westinghouse Electric Corporation, United States
US Electric Power Research Institute (EPRI)

Far East

Japan Nuclear Fuel Cycle Development Institute (JNC)
Japan Atomic Energy Agency (JAEA)
Japan Nuclear Energy Safety Organization (JNES)
JGC Corporation
Support Organisation to the Japanese Nuclear Utilities (JANUS)
Radioactive Waste Management Funding and Research Center (RWMC) and Kajima Corporation
Japanese Institute of Nuclear Safety Systems (INSS)
Nuclear Waste Management Organisation of Japan (NUMO)
Research Association for Nuclear Facility Decommissioning (RANDEC)
Institute of Applied Energy (IAE)

International Organisations

European Commission (EC)
International Atomic Energy Authority (IAEA)
Organisation for Economic Cooperation and Development (OECD)
World Health Organisation (WHO)

For more information on our experience and staff, go to our website: www.galson-sciences.co.uk.