

CURRENT STATUS OF THE UNITED KINGDOM PROGRAMME FOR LONG-TERM RADIOACTIVE WASTE MANAGEMENT

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ABSTRACT

In 1997, the UK programme for the deep disposal of radioactive waste was “stopped dead in its tracks” with the refusal by the Secretary of State for the Environment to allow Nirex to go ahead with its plans for an underground Rock Characterisation Facility at Sellafield in north-west England. Since that time a House of Lords’ Select Committee has held an enquiry into what went wrong and what the way ahead should be. In addition, Nirex and the nuclear industry players have also been analysing the past with a view to learning from the experience in taking things forward. In Nirex’s view this is essentially an ethical issue; the waste exists and we should deal with it in this generation. Three areas need to be better addressed if a successful programme of management of the nation’s radioactive waste is to be achieved:

- the process of how policy development and implementation can be achieved;
- the structure of the nuclear industry and its relationship to the waste management organisation; and
- the behaviour of the players in their interaction with stakeholders.

All three are underpinned by the need for transparency.

In recognition that developing a policy for managing radioactive waste has to be achieved with the support of all stakeholders, the Government instigated a consultation exercise in September 2001. The initial phase of this initiative is essentially a consultation about consultation and is intended to decide on how the next stages of a six year policy development programme should be addressed. In addition to this exercise, the Government is undertaking a fundamental review of the structuring of the United Kingdom Atomic Energy Authority (UKAEA) and British Nuclear Fuels plc (BNFL). They are both shareholders in Nirex and in November 2001 the Government announced the setting up of a Liabilities Management Authority (LMA) to manage the long-term nuclear liabilities that are publicly owned, particularly through those organisations. The future of Nirex will be directly influenced by the outcome of these reviews.

The Company does not see itself continuing in its present form. Indeed we and others have expressed the view that any new organisation should have responsibility for all UK wastes, not just ILW and LLW as at present, and that there should be clear legal obligations (for example in terms of transfer of liabilities) between the different institutions.

This represents a challenging time for Nirex but we have tried to analyse the failures of the past and are using our experiences to inform the debate. At the same time we are providing a crucial service to the waste producers and society as a whole, in co-operation with the regulators.

Ultimately, we believe there is a need for a new waste management organisation, independent of the nuclear industry, having responsibility for the long-term management of all UK radioactive waste which would have at its foundation, the competence and the experience of Nirex.

INTRODUCTION

At the Waste Management Conference 2000 (WM2K) we presented a paper giving the status of the programme for the management of radioactive waste in the United Kingdom (UK) at that time (1). In summary, that paper gave an account of the history of UK policy implementation for radioactive waste disposal from 1987 through to the demise of the Nirex repository site selection programme in 1997, and the follow-on events up until the beginning of 2000. The purpose of this paper is to give a present-day account of the current situation in the UK relating to radioactive waste management. The paper is, of course, written from a Nirex perspective - under our new mission statement we are the UK organisation responsible for providing safe, environmentally sound and publicly acceptable options for the long-term management of radioactive materials.

As noted in the WM2K paper, the collapse of the Nirex site selection programme in March 1997 centred around the outcome of a public inquiry into a planning application to construct an underground "Rock Characterisation Facility" (RCF). The refusal in March 1997 by the Secretary of State for the Environment reflected concerns of the Inquiry Inspector about the conventional environmental impact of the RCF, the lack of transparency in the site selection process, and the prematurity of the planning application. The programme was thus "stopped dead in its tracks" in the words of the March 1999 House of Lords Select Committee on Science and Technology (2), echoing an earlier report of the Parliamentary Office of Science and Technology (3) produced in the aftermath of the March 1997 decision.

Active public debate on issues surrounding the decision has taken place since the 1997 decision. Perhaps the most significant initial step was the House of Lords' Select Committee Enquiry into radioactive waste management which was analysed in our 2000 paper. In October 1999 the Government gave its initial response to the Select Committee's report (4) which was also summarised in the 2000 paper. One aspect of that response was that the Government department then responsible, the Department of Environment Transport and the Regions (DETR), announced that a Government consultation paper would be published "at Easter 2000". However, following much debate and questions raised in Parliament, the long awaited paper was not issued until September 2001 by the new Department of Environment, Food and Rural Affairs (DEFRA) and the Devolved Administrations (see later) (5). The consultation paper is dealt with in more detail later, but a key point to be stressed at the outset is that whilst previous policy (and indeed the House of Lords' report) centred on disposal as the long-term radioactive waste management option, the consultation paper assumes that all options are under consideration.

Nirex has tried to analyse the events leading up to the March 1997 negative decision. We believe this is essentially an ethical issue, the waste exists and we should deal with it in this generation. Our analysis indicates that for any future long-term waste management programme to succeed, three broad themes need to be addressed, all underpinned by an ethos of transparency:

- process: in that the pace of any programme should allow time for adequate dialogue with stakeholders and there should be clarity of the tests to be applied at key decision points;
- structure: any new organisation charged with long-term management should be separate from the nuclear industry - financed by it under the "polluter pays" principle but not controlled by it; and
- behaviour: any organisation seeking public endorsement of its proposals should be open, transparent and accountable in its dealings with stakeholders.

The work that Nirex has been doing in these areas is considered further in a complementary paper presented at this conference (6).

Following on from the publication of the House of Lords' Select Committee report, a Consensus Conference on radioactive waste management was held in London in May 1999 (7). A panel of "informed citizens" concluded, *inter alia*, that:

- radioactive waste must be stored underground in a monitorable and retrievable way regardless of cost;
- a neutral body to deal with waste management should be appointed by the Government;
- the criteria for site selection should be open and publicised;
- decision making must be open and transparent; radioactive waste issues should be made part of the Government's education strategy;
- the nuclear power programme should not be expanded until a way is found to deal adequately with the waste; and
- the industry had shifted in culture and there was a new feeling of openness in dealing with these issues.

In addition, there have been many conferences, debates, and other initiatives, both internal to Nirex and externally at all levels, which have kept the issues surrounding long-term management of the UK's radioactive waste very much at the fore. There are also a range of high-level Government reviews being undertaken regarding the major waste producers which will have an effect on the future structure of the nuclear industry and how its waste legacy is dealt with.

This paper looks at the key players involved in the issues surrounding radioactive waste management in the UK, it considers the implications, particularly for Nirex, arising from the various reviews being undertaken, and looks at Nirex's current and potential future role in taking any new Government policy forward.

THE MAIN PLAYERS IN RADIOACTIVE WASTE MANAGEMENT AND CURRENT ISSUES

Department of Environment, Food and Rural Affairs (DEFRA)

DEFRA is the new Government department, set up following the 2001 general election, which is responsible for developing radioactive waste management policy in line with the Government's broader environmental and nuclear safety policies. Specifically, the Radioactive Substances Division within DEFRA is responsible for the consultation exercise and was hitherto part of the DETR which no longer exists. With the devolution of Scotland, Wales and Northern Ireland from the UK Government in 1999, only the Scottish Executive has full responsibility to develop its own policy for radioactive waste management. However, the Devolved Administrations and the UK Government do, of course, maintain close links on these issues. The consultation document (5) was thus issued jointly by the UK Government and the Devolved Administrations.

The Regulators

The UK regulators concerned with radioactive waste management issues are the Health and Safety Executive through the Nuclear Installations Inspectorate (NII) under the Nuclear Installations Act 1965 and its regulations, and the Environment Agency (EA) which has responsibilities under the Radioactive Substances Act 1993. Given the creation of the Scottish Executive and its ability to formulate its own environmental policy, the Scottish Environmental Protection Agency (SEPA) is responsible for regulating under the Radioactive Substances Act in Scotland. In terms of radioactive waste management, the NII regulates operations on nuclear sites and the EA routine disposals (solid, liquid and gaseous) from the site. The EA has no statutory powers over waste storage until the licensee wishes to dispose of the waste. However, it does regulate storage at non-licensed sites such as hospitals and universities.

The role of the regulators in the Nirex proposal to construct the RCF was subject to some debate. Because the RCF was formally an investigation facility, Nirex was not in a position to apply for either a nuclear site license or a radioactive waste disposal authorisation. So there was no formal role for the regulators at that time and thus there was no formal interaction between them and Nirex; this was seen as counter productive. Many observers, including Nirex, the House of Lords' Select Committee and others have

therefore called for early regulatory involvement in any new process which would allow constructive debate and the voicing of opinions at the conceptual stage of proposals prior to any formal licensing process.

The Radioactive Waste Management Advisory Committee (RWMAC)

RWMAC is an independent advisory body to Government which reports to Ministers on an annual basis. It advises on all aspects of radioactive waste management including gaseous and liquid effluent discharges as well as solid radioactive waste. The membership of RWMAC includes specialists from the radioactive waste industry, environmental law and social sciences. There is a related committee which advises the Health and Safety Executive, the Nuclear Safety Advisory Committee (NUSAC). NUSAC and RWMAC have a close working relationship and often commission joint studies in areas of mutual interest (see later).

In September 2001, following its own deliberation on the future of radioactive waste management in the UK, RWMAC recommended to Ministers that what is needed for long-term deliverable policy formulation is a consensus-building approach involving full and open discussion of the issues (8); this advice was published on the same day as the DEFRA consultation document (see below).

RWMAC recommends that the process for establishing policy should be overseen by an independent, or at least "balanced-interest", body representing the broader public interest. Moreover, it should be founded upon clear guiding principles which, *inter alia*, provide adequate time for consultation, and are open and transparent. They suggest a possible five-stage approach which would allow proposals to flow from it in a logical manner. This would start with an essentially a clean sheet to evaluate options resulting in the preparation of policy recommendations by the oversight body. There would then be a further round of public review before submitting its policy recommendations to Government. RWMAC's views are not dissimilar to those set out by Ministers in the DEFRA consultation, and suggests that the consultation itself should be used to explore in detail the Committee's proposals.

British Nuclear Fuels plc (BNFL)

BNFL is wholly owned by the UK Government and was set up in 1971, stemming from the northern production arm of the United Kingdom Atomic Energy Authority (UKAEA). It operates in 15 countries as a commercial company and has grown into a US\$3 billion turnover company. It deals in all aspects of the nuclear industry: fuel manufacture and reactor services, electricity generation from its Magnox reactors, spent fuel management (including reprocessing), decommissioning and clean-up, and it operates the UK's national LLW disposal facility at Drigg in Cumbria. Its main centre of operation in the UK is the Sellafield site in Cumbria. The Magnox reactors are located at 11 sites in various parts of the UK with three undergoing decommissioning and others due to follow in the coming years. It is the UK's prime radioactive waste generator.

In July 1999, the Government announced that a public private partnership (PPP) of BNFL would be "good for BNFL and the wider community". This would mean transferring 49% of the Government's stake in BNFL to the private sector (but see the paragraph on the LMA, below).

British Energy

British Energy is the UK's largest electricity generator. It was created as a privatised company in 1996 and is quoted on the London and New York Stock Exchanges. It owns 8 nuclear stations: all of the UK's Advanced Gas Cooled Reactors and a Pressurised Water Reactor (Sizewell B); it also owns a coal-fired power station. It operates the joint venture AmerGen in the US with PECO Energy, and has a Canadian subsidiary, Bruce Power. British Energy has recently questioned the economics of reprocessing its spent fuel and has proposed that a centralised spent fuel storage (pending disposal) facility should be made available under a financing scheme similar to the US\$1 per MWh that operates in the US (9).

United Kingdom Atomic Energy Authority (UKAEA)

The UKAEA was set up by the Government in 1954 and was responsible for developing the UK nuclear generation programme. Today its main task is to manage the decommissioning and clean-up of its nuclear reactors and research facilities across some 5 sites in the UK. It is also responsible for the UK's input to the European fusion research programme.

The latest quinquennial review of UKAEA (QQR) was announced by the Government in July 2000 and was carried out in two stages, looking at organisational options and organisational performance respectively. The prime focus of stage one is the management of nuclear liabilities on behalf of the UK taxpayer and restoring the environment at the sites for which UKAEA is responsible during the next 60 years. This of course includes aspects of radioactive waste management. The main findings of the review can be found at reference (10) but the next section deals with one of the key outputs of the review.

Liabilities Management Authority (LMA)

Following the review of the UKAEA, and consideration of the PPP of BNFL, in November 2001 the Government announced the setting up of a Liabilities Management Authority (LMA) to take responsibility for most of the UK's public sector civil nuclear liabilities on behalf of the government (11). Essentially the LMA will take on most of BNFL's liabilities and assets – including reprocessing and MOX fabrication facilities at Sellafield – as well as those of the UK Atomic Energy Authority (UKAEA). BNFL would then be virtually debt-free, once legislation is passed. Under the plan, the LMA will hire BNFL to operate the THORP and Magnox reprocessing facilities and the Sellafield MOX Plant under 10-15 year contracts. However, once the initial contracts end, BNFL will have to compete to continue the work. The government will reconsider the part-privatisation of BNFL in 2004/2005. A white paper will be published by the government in spring 2002 covering the proposals for the management of UK public sector civil nuclear liabilities.

Ministry of Defence (MOD)

The Ministry of Defence generates radioactive waste from its maintenance of the UK's nuclear deterrent: the nuclear weapons and nuclear propulsion programmes. Following the abandonment of the Nirex repository siting programme in 1997, which had assumed that a repository would have been available by 2012, the Ministry of Defence announced in 1998 that it would undertake a review of how its nuclear submarines should be stored when withdrawn from service. The review, termed Project ISOLUS for “interim storage of laid-up submarines”, completed a first phase in 1999.

To date 11 nuclear submarines have been withdrawn from service and by 2040, the MOD's assumed date for a repository for planning purposes, some 30 submarines will have been decommissioned and Dreadnought (which entered into service in 1963) will have been in afloat storage for 55 years.

The options being considered are:

- afloat storage at new sites;
- land storage of the intact reactor compartment (as adopted by the US Navy);
- dismantling of the reactor compartment into major components for storage as unpackaged waste;
- further dismantling for storage as packaged waste.

Land storage strategy is being developed as this is less dependent on a national disposal facility and is expected to take up to three years to complete.

Project ISOLUS undertook a “front-end” consultation between January and July 2001 to ascertain the issues that the public and other stakeholders believe should be taken into account when deciding on the options. Nirex has been involved in some of these consultations and has had useful interaction with the participants in order to exchange ideas and learn lessons on public interaction. The findings of this phase

were published in November 2001 (12). They reflected some concern at the prospect of building more nuclear submarines in the absence of a disposal route, but in the meantime most of the participants felt that afloat storage should be discontinued and sites with existing nuclear facilities should be used for interim storage.

United Kingdom Nirex Limited (Nirex)

Nirex was set up in 1982 to find a disposal solution for the UK's intermediate and low-level waste. Note that there has never been any organisational responsibility outside of Government for finding a disposal solution for HLW and spent nuclear fuel (which is regarded as a resource and not a waste in the UK due to the reprocessing option).

Nirex is currently owned and financed by the nuclear industry in the proportions shown in Table I.

Table I. Nirex funding and shareholding

Organisation	Funding %	Share %
BNFL/Magnox	69.3	74.5
British Energy	7.7	10.8
UKAEA	14.8	14.7
MOD	8.2	0.0
Government (Department of Trade and Industry) has 1 Special share		

The funding percentages are based on the amount of waste these customers would send to a Nirex deep disposal facility, if one were available. This waste primarily comprises intermediate-level waste. There is also included a certain amount of alpha-bearing low-level waste which cannot go to the Drigg LLW facility.

As noted elsewhere in this paper, one of the issues that Nirex and others felt was partly responsible for the failure of 1997 was that we were perceived to be too close to the nuclear industry, too much under its commercial influence and thus in conflict with our environmental responsibilities. Thus, we expect that any future form of the Company should openly demonstrate its independence of the waste producers, although it would continue to be financed by them under the "polluter pays" principle.

Given the current hiatus in respect of policy, and Nirex's part in creating it, many have questioned the continued existence of the Company. However, since 1997 we have been trying to learn from the experiences of the past the past and how they can guide future policy development. With the agreement (and support) of our shareholders we have agreed that our role until new structures are formed should encompass:

- developing long-term management options and concepts for radioactive material;
- continuing to provide packaging advice to waste producers in co-operation with the regulators;
- maintaining the UK National Radioactive Waste Inventory along with DEFRA;
- working with stakeholders to build constructive relations, identifying what is needed to gain public acceptance and contributing to policy reviews, and
- maintaining our core competence of skills.

Our view, and the view of others, continues to be that there is justification for the continuing existence of Nirex during this time. What our position will be in the future is one of the fundamental themes of the

DEFRA review described in the next section. Our own thoughts on the future role of the Company are presented later.

THE REVIEWS

General

The last major reviews of the nuclear industry and radioactive waste management took place in 1994. These culminated in the publication in 1995 of two White Papers presenting Government Policy: *The Prospects for Nuclear Power in the UK*, *Conclusions of the Government's Nuclear Review* (13) and *Review of Radioactive Waste Management Policy, Final Conclusions* (14). The subsequent attempts to implement those policies (which envisaged deep disposal) led to the picture of the UK industry as we see it today and as summarised in the previous section.

In addition to the latest Government initiative on radioactive waste management, and the organisation-specific reviews referred to above, there a number of other reviews taking place. To a greater or lesser extent these involve consideration of radioactive waste management and may have an influence on the future structure of the nuclear industry in the UK:

- a review of energy policy by the Cabinet Office ("Number 10"), which was held between July and September 2001; conclusions were to be presented to the Prime Minister at the end of 2001 on energy policy set against the "challenges" of environmental pressures (reduction of carbon dioxide emissions), security and diversity of supply, and energy prices; a full account of all aspects of this review can be found on the Cabinet Office web-site (15), although the report to the Prime Minister was still awaited at the time of writing this paper;
- consideration of radioactive waste policy announced in October 2001 (16) by the cross-party Environment, Food and Rural Affairs Committee of the House of Commons (EFRA) (which monitors the workings of DEFRA) in view of the DEFRA consultation; in particular it sought views on the timetable and progress of the DEFRA consultation; the difficulties associated with current policy; the impact on policy of decommissioning, new plant construction and commencement of MOX production at Sellafield; and
- a joint RWMAC-NUSAC study of the requirements for conditioning, packaging and storage of ILW; this is looking at the current physical state of radioactive waste in the UK, long-term storage implications and issues caused by the collapse of the Nirex site selection programme, approaches of the Regulators, the role of Nirex and current policy; a report is yet to be published.

There is, of course, much detail to be found in the responses to each of these reviews which can be found in the referenced material. For its part, Nirex submitted written evidence to each of the reviews which was supplemented by oral evidence in the case of the EFRA review and RWMAC-NUSAC study. In essence, the theme of the Nirex responses reflected the three areas of process, structure and behaviour, and the underpinning concept of transparency referred to in the Introduction.

In terms of its response to the energy review, Nirex emphasised its neutrality on the issue of new nuclear build but stressed the importance of being able to deal with the consequences of subsequent waste production (17). The work that Nirex is doing on process would help in dealing with stakeholder concerns related to development of radioactive waste management policy. We said that we believe that the nuclear industry organisations should be restructured earlier rather than later, to give more certainty to the process and be done in a manner that would create maximum visibility and accountability. Regarding behaviour, we suggested that transparency must be central to the culture of any organisation in the nuclear industry attempting to win public support.

The role of Nirex was also examined in the EFRA review and RWMAC-NUSAC study. In this matter we explained that Nirex offers packaging advice to the waste producers which considers long-term implications of actions which are taken today (18). However, this only applies to ILW as there is no Government policy on long-term management of HLW and spent fuel. We also noted that resulting wastes from decommissioning and new build (including the Sellafield MOX plant) are in general not problematic for the Nirex concept (19) but before deciding on new build, the waste management organisation should be involved in the concept stage.

The RWMAC-NUSAC study looked more particularly at Nirex's current role and the implications for current waste storage in view of the "demise of the Nirex repository project". We explained that with the backing of our shareholders we had developed a mission and strategies which are relevant to the current uncertain period and stressing that we were the only organisation which provides national packaging specifications and standards (20).

DEFRA Consultation on Radioactive Waste Management Policy Development

As noted earlier, DEFRA and the Devolved Administrations published their long-awaited consultation paper *Managing Radioactive Waste Safely, Proposals for developing a policy for managing solid radioactive waste in the UK* on 12 September, 2001. DEFRA recognises the need to "inspire public confidence" in future decisions on policy development and has proposed to set up an independent authoritative body to advise it on information requirements for future decision making on options.

A proposed "rough guide" five-stage programme is set out for "illustrative purposes" as follows:

Stage 1	The current consultation on process, consideration of responses, planning the next stage.	2001-02
Stage 2	Research and public debate to examine the different options and recommend the best option (or combination).	2002-04
Stage 3	Further consultation seeking public views on the proposed option.	2005
Stage 4	Announcement of the chosen option, seeking public views on how this should be implemented.	2006
Stage 5	Legislation, if needed.	2007

DEFRA acknowledge that the shape and speed of the programme is dependant on many factors including the reaction to the consultation paper and the timetable itself. They say however "we must press ahead as quickly as we can. But we must also get the decisions right, and ensure that the strategy wins public confidence".

The first stage of the consultation closes on the 12 March, 2002. DEFRA hopes that the policy resulting on completion of the programme will command widespread support across the UK and believes that this can only be achieved following public debate of Stage 1. The consultation methods are therefore important and views are sought on the techniques that should be used. Views are also sought on the formation and funding of the advisory body referred to above, and how research into further information requirements should be dealt with, for example by the advisory body itself or a separate body altogether.

In the interim period during which policy is being developed, waste arisings still have to be managed in a way which does not foreclose future options. Views are sought on the effectiveness of current regulatory arrangements in dealing with this issue.

The paper also recognises that at this early stage, there are issues other than process that need to be addressed:

- the principle of segregating UK waste types by half-lives (the principle is proposed by the European Union (EU) and based on IAEA classification system to be used in conjunction with national systems);
- management of spent sealed sources (this issue has been addressed in detail by RWMAC (21) which suggested additional resources to manage historical sources, sale of new sources to include provision for disposal, and a dedicated organisation to take responsibility for abandoned sources);
- the link between waste substitution and the availability of a repository or other facility; (since 1976 BNFL contracts require resulting wastes to be “returned to sender” within 25 years after they are generated); substitution allows relatively small volumes of HLW to replace larger volumes of ILW and LLW which would otherwise have to be shipped;
- the general approach to decommissioning; the timetable should be agreed between the licensee and the regulators on a facility by facility basis taking account of safety, costs and technical developments, and recognising the lack of a national disposal facility;
- consideration of the UK stockpile of plutonium, including whether some (other than for “minimal” defence requirements) should be declared a waste or be regarded as a potential resource through MOX fuel fabrication; and
- consideration of the long-term management of uranium, including whether some proportion should be declared as waste; again the issue is determining between waste and resource.

THE FUTURE OF NIREX

One of Nirex's current, and historical, roles in the UK is to determine whether or not a waste producer's proposal for a packaging plant (for ILW) will meet the disposal requirements for a UK repository - the “Letter of Comfort Process”. This aspect of Nirex's work has explicitly been recognised by the regulators in their guidance to waste producers. Whilst they have the ultimate decision on whether a plant should be given the go-ahead, they say in their respective guidance that the licensee should demonstrate that future management options for radioactive waste should not be foreclosed and:

“The extent of conditioning and the type of packaging will need to be decided by taking account of all relevant factors. A Letter of Comfort issued by an appropriate organisation, which at the present time is UK Nirex, stating that the proposed waste form and its packaging should be acceptable for future potential disposal options, would be an important part of the above demonstration”. (22)

“Nirex's assessments are extensive and address the question of disposability. The Agency does not intend to replicate these assessments”. (23)

In terms of packaging advice, Nirex's role is primarily to ensure that wastes being packaged now are compatible with plans for their long-term management. Nirex advises waste producers on packaging requirements based on its cement based, phased geological disposal concept. Although there is uncertainty about policy, this concept has not been abandoned, it will be reconsidered alongside surface storage and other waste management concepts.

We are currently assessing whether our advice would be significantly different if underground ILW disposal is not pursued and other long-term waste management strategies were adopted. Our initial view

suggests that the Nirex specifications and standards (and hence the advice) are robust to a range of possible management options. However, should that view change (for whatever reason) then the liability for rectifying any changes lies with the waste producer. The process is described in Figure 1.

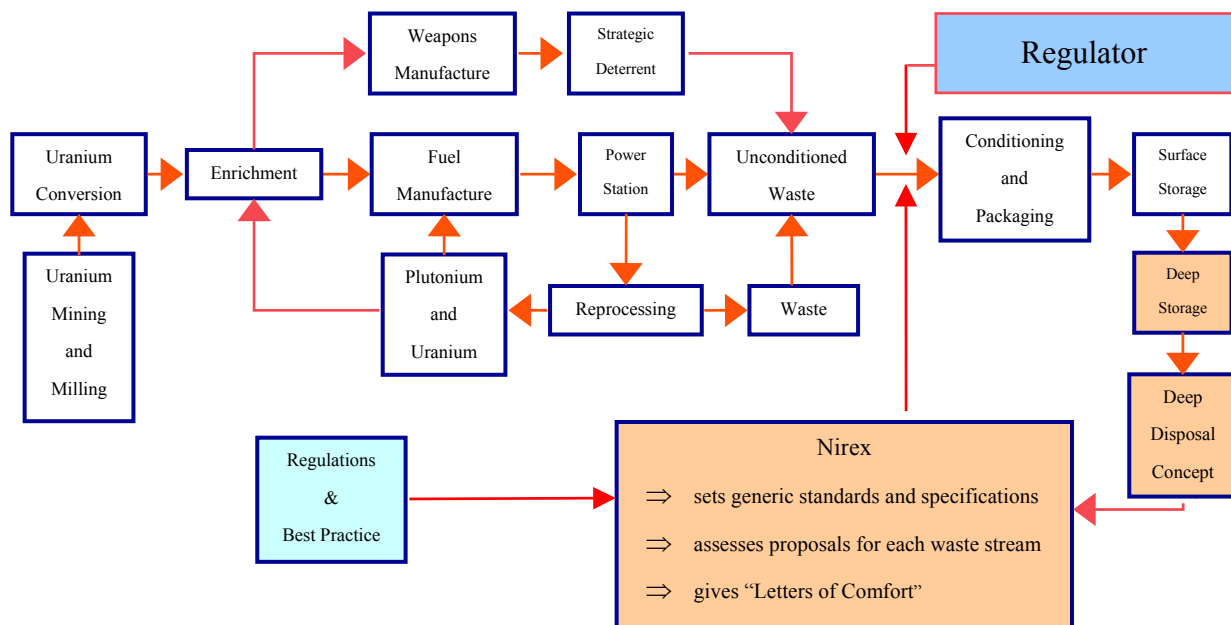


Fig. 1: Simplified nuclear fuel cycle and provision of Nirex advice

Our view of the future is based on our review (with others) of past experiences, and a detailed examination of the situation in other countries. The view is centred around our fundamental belief that whatever waste management option is chosen, policy implementation can only be achieved by an organisation that is separate from the nuclear industry - funded by it but not controlled by it. Such an organisation would be required to take a view of the very long-term (longer term than the proposed LMA given the intergenerational nature of the issues involved).

The Company does not see itself persisting in its present form. Indeed we and others have expressed the view that any new organisation should have responsibility for all UK wastes, not just ILW and LLW as at present, and that there should be clear legal obligations (for example in terms of transfer of liabilities) between the different institutions. Moreover, Nirex itself has a core competence of expertise which should be maintained during the consultation and be used to seed the foundations of any new organisation. Given also the public acceptance nature of the task, those professions with experience of these matters should supplement this competence.

CONCLUSIONS

The UK is yet again having an active debate on all aspects of future policy on radioactive waste management. The DEFRA consultation is the main thrust for developing national options for the long term. This represents a challenging time for Nirex but we have tried to analyse the past and are using these experiences to inform the debate and at the same time fulfilling a crucial service to our customers, the waste producers, in co-operation with the regulators.

The key success factors to future policy development we believe can be summarised as:

- the public sign-on to the process of phased decision-making;
- an early re-structuring of the industry so that organisational responsibilities are clear at the outset with Nirex becoming separate from but financed by the nuclear industry; and
- the adoption of open and transparent cultures of the organisations attempting to win public acceptance of proposal.

Ultimately, we see a new independent waste management organisation having responsibility for the long-term management of all UK radioactive waste which would have at its foundation, the competence and the experience of Nirex.

REFERENCES

- (1) John Mathieson, UK Nirex Ltd: "Status of the UK Programme for Management of Radioactive Waste following the House of Lords Review" in Proceedings of Waste Management 2000, Feb. 27 - March 2, 2000, Tucson Arizona.
- (2) "Management of Nuclear Waste", report of the House of Lords' Select Committee on Science and Technology; London: The Stationery Office HL Paper 41.
- (3) Parliamentary Office of Science and Technology: "Radioactive Waste - Where Next?" POST 1997.
- (4) Department of the Environment, Transport and the Regions: "The Government's Response to the House of Lords' Select Committee on Science and Technology Report on the Management of Nuclear Waste." 25 October 1999. See www.detr.gov.uk.
- (5) "Managing Radioactive Waste Safely. Proposals for developing a policy for managing solid radioactive waste in the UK". DEFRA, September 2001. See www.defra.gov.uk.
- (6) John Dalton and Elizabeth Atherton, UK Nirex Ltd: "Finding a Solution – The Importance of Transparency" in Proceedings of Waste Management 2002, Feb. 24 - 28, 2002, Tucson Arizona.
- (7) "Radioactive Waste Management – UK National Consensus Conference, 21-24 May 1999, Citizen's Panel Report". UK CEED. See www.ukceed.co.uk.
- (8) Radioactive Waste Management Advisory Committee: "The Radioactive Waste Management Advisory Committee's Advice to Ministers on the Process for Formulation of Future Policy for the Long Term Management of UK Solid Radioactive Waste" September 12, 2001. See www.defra.gov.uk/rwmac.reports.
- (9) British Energy: "Nuclear Waste - British Energy's View". Submission to the House of Commons Environment Food and Rural Affairs Committee. 13 November 2001. See www.british-energy.com/media/press/index.htm
- (10) Department of Trade and Industry: "UKAEA Quinquennial Review" DTI, November 2001. See www.dti.gov.uk/energy/ukaeareview/ukaeareport/index.htm.
- (11) Department of Trade and Industry: "Statement by the Secretary of State for Trade and Industry on Civil Nuclear Liabilities". Hansard Col 990, 28 November 2001.
- (12) Lancaster University, Centre for the Study of Environmental Change: "Project ISOLUS Front End Consultation, Final Report. Report to the MoD". CSEC, Lancaster University, September 2001. See www.nucsubs.org.uk.
- (13) Department of Trade and Industry and the Scottish Office: "The Prospects for Nuclear Power in the UK. Conclusions of the Government's Nuclear Review". Cm 2860. London, HMSO, May 1995.

- (14) Department of the Environment: "Review of Radioactive Waste Management Policy. Final Conclusions" Cm 2919. London, HMSO, July 1995.
- (15) Performance and Innovation Unit: PIU Review of Energy Policy. See www.cabinet-office.gov.uk/innovation/2001/energy/energyscope.shtml.
- (16) House of Commons Environment Food and Rural Affairs Committee: Evidence on Radioactive Waste Policy. See www.parliament.co.uk/commons/selcom/efrahome.htm.
- (17) Chris Murray, UK Nirex Ltd: Letter to the Cabinet Office Performance and Innovation Unit, 7th September 2001.
- (18) UK Nirex Ltd. "Nirex Submission to the House of Commons Environment Food and Rural Affairs Committee Inquiry into Radioactive Waste Policy" November 2001. See www.nirex.co.uk.
- (19) UK Nirex Ltd: "Generic Phased Disposal System Documentation". March 2001. (Available on CD Rom).
- (20) UK Nirex Ltd: "Nirex Response to Questions from the Joint RWMAC/NuSAC Study of the Requirements for Conditioning, Packaging and Storage of Intermediate Level Waste". 3 October 2001.
- (21) Radioactive Waste Management Advisory Committee: "The Radioactive Waste Management Advisory Committee's Advice to Ministers on the Problems of 'Small Users' of Radioactive Materials." 2000. See www.defra.gov.uk/rwmac/reports.
- (22) Health and Safety Executive, Nuclear Safety Directorate: "Guidance for Inspectors on the Management of Radioactive Materials and Radioactive Waste on Nuclear Licensed Sites". HSE 13 March 2001.
- (23) Environment Agency: "Environment Agency Guidance on the conditioning of Intermediate Level Waste". Available from www.environment-agency.gov.uk/business/ras.