New Feature ..... *International Update, pg. 10*

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CHANGE IN 2nd REPOSITORY DEADLINES REQUIRES LEGISLATION SAYS COUNSEL

In response to an August 21, 1986 request from House Interior Chairman Morris K. Udall asking for a copy of what was initially explained as an already existing legal memorandum, Secretary Herrington has forwarded to the Arizona Congressman a recently written DOE counsel opinion stating that the provisions of the Nuclear Waste Policy Act (NWPA) "requir[ing] recommendations concerning a second repository are not themselves supplanted by an amendment to the Mission Plan required by Section 301 of the Act." This contrasts with the view voiced by OCRWM Director Rusche at recent Congressional hearings. He has maintained that DOE was complying with the NWPA by including in a revised Mission Plan DOE's decision to indefinitely delay the second repository program.

The legal opinion was forwarded to Mr. Udall on September 9, with a cover letter from the Secretary explaining that he had misunderstood the Interior Chairman's question (See **Legal Opinion** in **the HLW Focus)**

NO SURPRISES, NC DESIGNATED AS HOST FOR 2nd SE LLRW SITE

On September 11, the Southeast Compact Commission, by a vote of 14-2, designated North Carolina as the state to host the second Southeast regional LLRW disposal facility. The designation followed the Commission's acceptance of Dames & Moore's technical report on the state rankings on Wednesday, September 10. The two North Carolina Commissioners voted in opposition to the designation. Prior to the vote NC officials, tried in vain to convince the Commission to accept a waste volume projection scenario that would have resulted in Georgia being designated as the top ranked state.

NC Commissioner Captain Bill Briner, an Associate Professor at the Duke Medical Center, reported that the Commission listened to the new data presented by the state but was not convinced. When asked about his personal view of whether North Carolina would pull out of the agreement he replied that in his view the state should stay in. (See **North Carolina** pg. 2)

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(**North Carolina** from pg. 1)

Future Of NC Uncertain

Captain Briner expressed a high degree of uncertainty as to what future activities could occur in North Carolina following the State's designation. The biggest unknown is what the legislature will do when it reconvenes. A bill to revoke the State's membership in the compact remains under active consideration and will surely be one item on the top of the upcoming legislative agenda.

NC Data Supported Designation ?

Though the Commission did reject a new volume projection scenario presented by North Carolina for the first time at the Atlanta session, the two South Carolina Commissioners stated that they voted in favor of the North Carolina designation based on the comprehensive volume projection data developed by North Carolina Governor's Science Advisor Dr. Earl MacCormac and forwarded to all the Commissioners for their review on August 14. Of the nine volume projection scenarios provided by Dr. MacCormac, six ranked North Carolina as the top candidate host state.

This particularly impressed SC Commissioner, Dr. John Stucker, who in casting his vote with the majority, stated that he was doing so, "based largely on the information submitted to the Commissioners in the August 14 letter by Dr. MacCormac on behalf of North Carolina." From reports received from others at the session, Commissioner Stucker's s citing of Dr. MacCormac's data as supporting the designation of North Carolina was not taken lightly. **

NRC RELEASES BRC POLICY AS FINAL RULE

A week or two before even the NRC staff expected action, the NRC Commissioners approved and released without public hearing the staff-developed Below Regulatory Concern Policy Statement which sets out the manner in which the Commission will handle petitions for rulemaking to exempt specific waste streams from disposal in licensed LLRW facilities.

Though the Commission Policy Statement issued as a final rule in the August 29 **Federal Register** (FR, Vol. 51, No. 168, Pg. 30839) does not differ significantly from the earlier reported staff recommendations, the Commission did direct the staff to prepare a generic rulemaking on BRC waste stream exemptions and issue an Advanced Notice of Proposed Rulemaking (ANPR) within ninety days of the issuance of the Policy Statement.

Petitions Acceptable Now

According to the NRC staff and the FR notice, the Commission's decision to proceed with a generic rulemaking was made in order to assure full compliance with the provisions of the Low Level Radioactive Waste Policy Amendments Act. This does not mean that action on petitions for BRC exemptions submitted according to the policy statement guidelines will not be accepted until the rulemaking is completed. Petitions can be submitted and will be processed according to the policy statement guidelines while the generic rulemaking is underway.

Intended for Generic Waste Streams

As stated in the notice, the policy establishes guidelines for the expeditious handling of BRC petitions for rulemaking for waste streams from "multiple producers." Individual licensees seeking approval for disposal of "unique waste streams" are directed to submit disposal plans under 10CFR 20.302(a)

Qualification Criteria

The statement lists fourteen criteria against which BRC petitions will be judged in order to determine whether the waste streams are suitable for expedited BRC action. These fourteen criteria are:

1. Disposal and treatment of the wastes as specified in the petition will result in no significant impact on the quality of the human environment.

2. The maximum expected effective dose equivalent to an individual member of the public does not exceed a few millirem per year for normal operations and anticipated events.
3. The collective doses to the critical population and general population are small.
4. The potential radiological consequences of accidents or equipment malfunction involving the wastes and intrusion into disposal sites after loss of normal institutional controls are not significant.
5. The exemption will result in a significant reduction in societal costs.
6. The waste is compatible with the proposed treatment and disposal options.
7. The exemption is useful on a national scale, i.e., it is likely to be used by a category of licensees or at least a significant portion of a category.
8. The radiological properties of the waste stream have been characterized on a national basis, the variability has been projected, and the range of variation will not invalidate supporting analyses.
9. The waste characterization is based on data on real wastes.
10. The disposal form of the waste has negligible potential for recycle.
11. Licensees can establish effective, licensable, and inspectable programs for the waste prior to transfer to demonstrate compliance.
12. The offsite treatment of disposal medium (e.g., sanitary landfill) does not need to be controlled or monitored for radiation protection purposes.
13. The methods and procedures used to manage the wastes and to assess the impacts are no different from those that would be applied to the corresponding uncontaminated materials.
14. There are no regulatory or legal obstacles to use of the proposed treatment or disposal methods.

Agreement State Involvement

The Agreement States are to play "an important role in ensuring that the system [the BRC rulemaking process] works on a national basis and that it remains equitable." The policy specifies that "rulemaking granting petitions will be a matter of compatibility for Agreement States," and thus rulemaking will be coordinated with the states.

The Generic Rulemaking

When contacted by the EXCHANGE, NRC waste management staff explained that the current intent with regard to the Commission's direction to proceed with a generic rulemaking is to develop a list of questions for the ANPR addressing various aspects of the guidelines and procedures included in the policy statement. At this time staff does not intend to develop a generic rule outlining a specific course of action to be followed by petitioners. **

CANADIAN FIRM BUYS NUS PROCESS SERVICES

SNC, a Canadian engineering firm (with revenues in excess of $150 million) headquartered in Montreal and parent company of London Nuclear, is purchasing Columbia, S.C.-based NUS Process Services Corporation (NUSPSC). The purchase is expected to be completed by September 30, 1986. The end result will be that London Nuclear and NUSPSC will be melded into one company, LN Services, with headquarters in Columbia, South Carolina. Gerry Motl, the President of NUS, reported to the EXCHANGE that the resulting union will provide a "synergy" that will be an overall advantage in the very competitive LLRW processing market. He remarked that with London Nuclear's funnel to Canadian waste technology the newly formed company will be able to offer a broad range of expertise to U.S. waste generators.

Officers, Sale Price

The President of the new company will be Eric LeSurf. Bob Hemmings will be the VP for operations, and Mr. Motl the VP for business development.

Last year London Nuclear had revenues of four million dollars with NUS reaching six million. The purchase price for NUSPSC is rumoured to be in the neighborhood of $8 million, but Gerry Motl would not confirm the amount. **

IN NEW ENGLAND

Rhode Island has ratified compact legislation that establishes a two-state compact with **Massachusetts.** A similiar bill has not been introduced in the Massachusetts legislature.

Maine wrote to the Northeast Compact Committee inquiring as to the possibility of negotiating a contract to dispose of Maine's waste at Hanford. The Committee rejected the initiative with members commenting that it would undermine the basis and intent of the regional compacts.

IN THE CENTRAL MIDWEST

In **Illinois,** the designated host state for the Illinois-Kentucky Central Midwest Compact, Dr. Terry Lash, Director of the State's Department of Nuclear Safety, informed the EXCHANGE that the state's Geological survey has completed and submitted to his Department three LLRW disposal facility siting reports as required under state law. The first was a mapping of suitable geological regions within the state; the second a review of proposed siting criteria; and the third a description of how a proposed site would be characterized against proposed siting criteria.

Dr. Lash explained that activities were already underway with the State LLRW Citizen's Advisory Group to develop a siting plan. The intent is to complete a preliminary draft of the plan by January, 1987. The plan is to include details on public hearing procedures, host community incentives and rights, and site monitoring plans.

Under the State's siting procedures a private contractor is to be designated to identify possible locations for the regional disposal facility. The Department Director reported that the contractor is scheduled to be selected in early '87, with the contractors site location recommendations report to be completed by late '87. The selection of the three or four sites to be characterized is to be made in early 1988.

In order to carry out the Department site selection activities, Dr. Lash has acquired the services of **Eric Schwing,** who was formerly with the Michigan Department of Health, and **Dr. Michael Momeni** from Argonne Laboratory. Eric will be the DNS staff attorney. Dr. Momeni has considerable technical expertise in the preparation of Environmental Impact Statements and will be directly involved in final LLRW disposal site selection-EIS process.

IN TEXAS

Patiently but surely, the Texas LLRW Authority is again progressing toward the naming of a site for a state-only LLRW disposal facility. Lee Matthews of the Authority staff reports that the target date for selection of the two "final" sites is scheduled for November of this year with the final site selection occurring in May 1987. Three sites are currently under consideration. All are in Hudspeth County. The "final" sites will be selected from this group of three.

Lee reported that a Below-Regulatory Concern petition that would allow specific LLRW streams to be disposed of in a sanitary landfill has been submitted to the State's regulatory agency, the Department of Health. In addition, the Authority staff is developing draft legislation that would establish an impact assistance and financial incentives program for the community that would host the LLRW disposal facility.

According to Mr. Matthews, the Authority has also decided to design the state LLRW disposal facility to meet both RCRA and NRC requirements to forestall any future problem that could arise because of the as-yet-unresolved NRC-EPA jurisdictional conflict over the regulation of mixed waste.

ON MIXED WASTE

EPA and **NRC** staff are reporting that substantial progress has been made toward resolving the long lived interagency jurisdictional conflict over the regulation of mixed waste (RCRA-Hazardous waste and LLRW). NRC staff is expected to submit a report to the Commission that will include

recommendations on a final course of action necessary to resolve the current jurisdictional conflicts on September 30. From lengthy disucssions with EPA and NRC staff it seems very unlikely that the staff will recommend legislation to reach a solution.

Though EPA will not be able to issue locational on siting standards for disposal facilities for RCRA-designated waste any sooner than initially predicted (9/88), there appears to be enough of an agreement between the two agency staffs to lead one EPA staffer to comment that it would be highly unlikely that EPA RCRA locational standards would "submarine" any NRC LLRW disposal facility requirements. However, EPA is giving no concrete guarantee that this could not occur, allowing that the Agency requirements will be developed after a comprehensive rulemaking involving extensive public input.

There has been one significant change in the joint actions that were planned to be taken by the agencies. Earlier both staffs had indicated that a joint guidance document would be developed with regard to the disposal of mixed waste. The plan to issue this joint guidance document has been scrapped by mutual agreement. Both agencies' staff emphasized that the decision not to release such a document is in no way indicative of a major disagreement on moving toward an administrative resolution of the jurisdictional conflict.

IN THE DOE

Dr. David Rossin was sworn in as Assistant Secretary for Nuclear Energy on August 16, 1986. Dr. Rossin's responsibilities include remedial action and waste technology activities. He was formerly the Director of the Nuclear Safety Analysis Center at the Electric Power Research Institute (EPRI) in Palo Alto, California.

IN THE INDUSTRY

Duratek Corporation (DRTK-OTC), a subsidiary of national Patent Development Corp. (NPD-AMEX/PSE) has been awarded a contract to process low-level nuclear waste water at the Maine Yankee Atomic Power Station, operated by the Maine Yankee Atomic Power Company of Augusta, Maine. Duratek has installed an Enhanced Volume Reduction (EVR) Processing System at the single unit, 825-megawatt reactor in Wiscasset, Maine. Duratek's system can use either the company's new Durasil technology or conventional ion exchange resins. Maine Yankee will be the first New England utility to install an EVR System. Duratek has installed full-service units at Public Service Electric & Gas Co.'s Salem Plant in New Jersey, the New York Power Authority's Indian Point 3 Station, Virginia Power Co.'s North Anna Power Station, and Florida Power & Light's Turkey Point Plant. A system will soon be operational at the Donald C. Cook Nuclear Power Plant in Bridgman, Michigan. Duquesne Light Company's Beaver Valley Plant and Toledo Edison's Davis-Besse Plant have each purchased an EVR System.

The **Electric Power Research Institute (EPRI)** has awarded a contract to **NUSPSC** to perform a study entitled "Low-Level Radwaste Disposal - A Look at Six Burial Sites". The basic purpose of the study is to describe what went right at the three sites currently operating and what went wrong at those that are now shut down. In addition, regulations existing at the time of initial site licensing will be compared to the current 10 CFR 61 requirements. The study is scheduled for completion later this year.

NUS Process Services Corporation (NUSPSC) just completed a successful liquid abrasive decontamination project at the Rochester Gas & Electric Ginna Station. The LADS unit, which was positioned on-site at Ginna since January, was used to decontaminate various scrap metal, scaffolding, tools, and chainfalls. The equipment is now available for reassignment.

Waste Management Inc., the parent company of **Chem Nuclear** and **Chemical Waste Management** has undergone some structural reorganization. Chem Waste has also filed with the Securities and Exchange Commission to issue a public offering of up to 19-20 percent of their stock. Under the

restructuring Chem Nuclear will apparently become a subsidiary of Chemical Waste so the proposed stock offering would include Chem Nuclear. The SEC registration was filed on September 5th.

ON THE MOVE

David A. Zigelman has been appointed Director of marketing and projects for Westinghouse Hittman Nuclear, Inc. In his new assignment, Dave will be responsible for all marketing and sales activities and customer liaison with commercial nuclear power plant operators.

Dr. Ralph R. DiSibio has been named Director of Westinghouse's Advanced Power System Division's newly created Value Ventures unit. Dr. DiSibio will be responsible for managing external ventures and investments related to business development and diversification and will coordinate this activity with the divisions to ensure mutual benefit from joint ventures, licenses and other business arrangements. As appropriate, and in conjunction with the APSD divisions, Value Ventures will serve as the focal point in the management of new enterprises that may be added to the division portfolio at a later time. Dr. DiSibio was most recently the Manager of Business Development for the Advanced Power Systems Division. **

REPORTS OF NOTE (LLRW)

Survey of Statistical and Sampling Needs for Environmental Monitoring of Commercial Low-Level Radioactive Waste Disposal Facilities (NUREG/CR-4162); Division of Radiation Programs and Earth Sciences, Office of Nuclear Regulatory Rsearch, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. This document presents the results of Task 1 of a project entitled "Application of Statistics in Siting and Managing Commercial Low-Level Radioactive Waste Disposal Sites." Task 1 was designed to develop guidance for determining the overall needs for sampling and statistical work in characterizing, surveying, monitoring and closing commercial low-level waste sites. The overall project is designed to produce information for developing guidance on implementing 10 CFR Part 61.

Results are listed in the Executive Summary and areas requiring additional investigation are discussed. If cost-effectiveness and statistical reliability are considered of prime importance, then double sampling, compositing, and stratification (with optimal allocation) are identified as key issues for NRC's consideration. Alternatively, if the principle concern is avoiding questionable statistical practices, then the applicability of kriging (for assessing spatial pattern), methods for routine monitoring, and use of standard texbook formulae in reporting monitoring results should be reevaluated. Other important issues are identified in the report. Copies available from: The NRC Public Document Room, 1717 H Street, N.W., Washington, D.C. 20555; Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, D.C. 20013-7082 or The National Technical Information Service (NTIS), Springfield, VA 22161.

Corrective Measures Technology for Shallow Land Burial at Arid Sites: Field Studies of Biointrusion Barriers and Erosion Control (LA-10573-MS); Los Alamos National Laboratory, Los Alamos, New Mexico 87545. This report summarizes the field research program at LANL involving corrective measures technologies for arid shallow land burial (SLB) sites. Results of field testing of a biointrusion barrier installed at a close-out waste disposal site (Area B) at Los Alamos are presented. Soil erosion and infiltration of water into a simulated trench cap with various surface treatments were measured, and the interaction between erosion control and subsurface water dynamics is discussed relative to waste management.

(**Legal Opinion** from pg. 1)
at the July 31 Hearing (See EXCHANGE, Vol. 5, No. 13) when he (the Secretary) said that the Department already had a written legal opinion regarding the legality of the Department's action to delay the second repository program.

The opinion provided to Mr. Udall is dated September 5, 1986, and was forwarded to Mr. Ben Rusche from General Counsel Michael Farrell.

Inclusion In Mission Plan Justified

The opinion provided by Mr. Farrell does argue that OCRWM was within the law in determining that the Mission Plan was a vehicle through which Congress should be informed of "significant matters, including new information relating to the conduct of the second repository program." It points out, however, that the provision of the Act requiring "recommendations regarding the [second] site in 1989 and 1990...remain intact until repealed, amended, or supplanted by new legislation...."

In the words of the General Counsel, "harmonizing" the elements of the NWPA regarding the Mission Plan and the second round recommendation "would entail treatment of matters such as the second repository in the Mission Plan with a view to consideration of appropriate new additional legislation by Congress."

OCRWM management staff are not offering any reaction to the legal opinion, other than saying that an amended version of the Mission Plan is being prepared and will be submitted to Congress in October.

RECOMMENDATION ON DEFENSE HLW FEE THROUGH CONCURRENCE (ALMOST)

DOE's recommendation on Defense Program's contribution to the Nuclear Waste Trust Fund is finally on its "final" concurrence go-around with the Department. Though this is about the second or third time the recommendation has been on this track, staff is confident that this is the last. The proposed recommendation should be released to the **Federal Register** before the end of this month.

DOE Defense and Military Applications offices have already concurred. Notification of concurrence has not yet been received from the Office of Management and Budget but is expected within the week.

The proposed recommendation does not differ significantly from what has been reported in the past. However, rather than specifying an absolute dollar amount, it projects the potential range of the Defense contribution. The range was developed by estimating costs based on the different media that could be chosen as the site of the repository and other factors that are taken into account in the methodology proposed to calculate the contribution.

The proposed methodology used to calculate the Defense contribution maintains its two-part structure -- one, a calculation of the defense contribution to the overall repository costs; the other, a calculation for the incremental costs directly attributed to combining defense wastes with commercial wastes in a single repository.

When the methodolgy is used assuming

current program scenarios the Defense contribution is said to come out to be somewhere between $4 and $4.5 billion dollars.**

UNEXPENDED FY86 FUNDS FOR HLW PROGRAM BETWEEN $100-200 MILLION

Though the final funding provided by the Congress to support the high-level waste program in FY87 will be well below the $750 million + requested by DOE (probably somewhere near $500 million), FY87 HLW program activities may not have to be curtailed to any great degree. According to information obtained by the EXCHANGE, the OCRWM is said to have somewhere between $200-225 million in unexpended funds for FY86 that will be available for carryover to FY87. DOE officials contacted by the EXCHANGE maintain that the carryover is much lower, nearer $125 million, but other sources contend that $200 million is about right. **

WASHINGTON STATE ISSUES RFP FOR HLW REPOSITORY IMPACT STUDY

The State of Washington has issued a Request for Proposals from outside contractors to complete a "Report on Social and Economic Impacts of a Potential High-Level Nuclear Waste Repository" at the DOE-proposed Hanford site.

The projected time period for completion of the report is 43 months. Funding for the effort is contingent upon obtaining a grant from DOE. The RFP does not put a dollar amount on the contract's value, but it is pointed out that similar work conducted by contractors in other potential repository states ended up costing between "two and four million dollars."

Highlights of Scope of Work

The objectives of the socioeconomic impact study as listed in the RFP are as follows:

- Develop factual bases for informed decisions on the repository, and prepare the State and localities for subsequent negotiation or legislation.
- Encourage public and local government participation in defining impacts, risks and compensation needs.
- Evaluate impacts of commercial and defense waste activities at all stages of repository development.
- Identify the full range of impacts which the State, local governments, business enterprises or citizens might incur, as the basis for mitigation or compensation claims.
- Avoid adverse impacts where possible, obtain full and timely mitigation where impacts are not avoidable, and obtain compensations, if appropriate, for any impacts that are not mitigable.
- Ensure equitable distribution of impact payments among affected governments.
- Maximize potential benefits from repository development activities.
- Minimize risks and results of possible accidents.
- Obtain full federal responsibility for social and economic costs and damages resulting from accidents.

Specific details on contractor tasks to be completed in order to meet these objectives are detailed in the RFP. As stated in the cover memo accompanying the announcement:

> "Proposals will be evaluated on the basis of the qualifications, experience, and demonstrated ability of the proposer to conduct a technically superior study, and on the quality of the study design that is submitted. The state is not interested in "boilerplate" or "off-the-shelf" proposals. The final study must combine the ability to meet the most rigorous standards of scientific peer review with relevance to the policy needs of the state and its local governments."

Procurement Contact

For a copy of the RFP contact **Jerry Parker** at **(206) 459-6678.** Proposals are due by 12 Noon, Pacific Time, on Thursday, October 30, 1986. **

REPORTS OF NOTE (HLW)

ERG REVIEW OF CONTAINMENT FAILURE PROBABILITY AND REPOSITORY FUNCTIONAL DESIGN CRITERIA (BMI/ONWI-608); June, 1986; Office of Nuclear Waste Isolation, Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201-2693. The Engineering Review Group (ERG) was established by the Office of Nuclear Waste Isolation (ONWI) to help evaluate engineering-related issues in the U.S. Department of Energy's nuclear waste repository program. The June 1984 meeting of the ERG considered two topics: (1) statistical probability for containment of nuclides within the waste package and (2) repository design criteria. This report documents the ERG's comments and recommendations on these two subjects and the ONWI response to the specific points raised by ERG.

Salt Dissolution and Collapse at the Wink Sink in West Texas (BMI/ONWI-598); June 1986, prepared for Office of Nuclear Waste Isolation, Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201-2693. The Wink Sink, in Winkler County, Texas, is a collapse feature that formed in June 1980 when an underground dissolution cavity migrated upward by successive roof failures until it breached the land surface. The original cavity developed in the Permian Salado Formation salt beds more than 1,300 feet below ground level. Natural dissolution of salt occurred in the vicinity of the Wink Sink in Several episodes that began as early as Salado time and recurred in later Permian, Triassic, and Cenezoic time. Although natural dissolution occurred in the past below the Wink Sink, it appears likely that the dissolution cavity and resultant collapse were influenced by petroleum production activity in the immediate area. Drilling, completion, and plugging procedures used on an abandoned oil well at the site of the sink appear to have created a conduit that enabled water to circulate down the borehold and dissolve th salt. When the dissolution cavity became large enough, the roof failed and the overlying rocks collapsed into the cavity. Similar collapse features where underground salt beds have been intentionally dissovled during solution mining or accidently dissolved as a result of petroleum production activities.

Preliminary Analyses of Scenarios for Potential Human Interference for Repositories in Three Salt Formations (BMI/ONWI-553), Office of Nuclear Waste Isolation, Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201-2693. Preliminary analyses of scenarios for human interference with the performance of a radioactive waste repository in a deep salt formation are presented. The following scenarios are analyzed: (1) the U-Tube Connection Scenario involving multiple connections between the repository and the overlying aquifer system, (2) the Single Borehold Instrusion Scenario involving penetration of the repository by an exploratory borehole that simultaneously connects the repository with overlying and underlying aquifers, and (3) the Pressure Release Scenario involving inflow of water to saturate any void space in the repository prior to creep closure. The methodology to evaluate repository performance in these scenarios is described and this methodology is applied to reference systems in three candidate formations: bedded salt in the Palo Duro Basin, Texas; bedded salt in the Paradox Basin, Utah; and the Richton Salt Dome, Mississippi, of the Gulf Coast Salt Dome Basin.

REPROCESSING AND HIGH-LEVEL WASTE MANAGEMENT IN THE UNITED KINGDOM : THE PRESENT CONTROVERSY

Neil J. Numark*
John Gaunt

Introduction

A major controversy is currently taking place in the United Kingdom over the extent of the continued commitment to reprocessing spent nuclear fuel. The U.K. has successfully operated the reprocessing plant at Sellafield over three decades and plans are in hand to expand its capacity by the early 1990's. Concern over recent leaks from the existing plant and over the economics of reprocessing were raised in a recent report by a Select Committee of Parliament. Responses to this report have now been published by the Government and the industry. This article describes the current debates and assesses the likely outcome. First, a discussion of the U.K. fuel cycle is provided.

Background on the U.K. Fuel Cycle

Unlike most other countries in the world with nuclear power programs, the U.K. has no light-water power reactors and has only one small experimental reactor that uses heavy water. Up to now, the U.K. nuclear power program has been based exclusively on gas-cooled reactors -- starting first with the natural-uranium metal fuelled, graphite-moderated, gas-cooled "Magnox" system (named after the type of cladding used for the fuel elements). The advanced gas-cooled reactor system (AGR) followed, using 2.4% enriched uranium oxide pellets clad in stainless steel, graphite moderated and cooled by carbon dioxide gas. Because natural uranium was used as the fuel for the Magnox reactors, it was essential to use a metallic cladding material with a very low neutron absorption cross-section. A magnesium-aluminum alloy was developed. Such alloys corrode quickly when stored in water. Consequently, as methods for dry storage of spent fuel had not been developed when the first Magnox power stations came on line, reprocessing was developed early in the U.K. out of necessity.

To date, some 25,000 metric tons (MT) of Magnox fuel has been reprocessed by British Nuclear Fuels (BNFL) in the Sellafield plant, and it is expected that an additional 13,000 MT will be reprocessed before the Magnox stations come to the end of their useful life.

The plant capacity is approximately 1,250 MT per year. The high-level radioactive waste resulting from this reprocessing has been stored in double-walled stainless steel tanks awaiting vitrification.

The existing Sellafield plant was designed for the reprocessing of uranium metal fuel and cannot be used directly to reprocess uranium oxide fuels. For this purpose, BNFL has decided to construct the new Thermal Oxide Reprocessing Plant (THORP) at the Sellafield site, scheduled to come on line by the early 1990's. The bulk of the oxide fuel produced in the AGRs in the U.K., together with the spent LWR fuel from BNFL's overseas customers, is currently being stored in specially designed storage ponds at Sellafield prior to reprocessing in THORP. This plant is designed to reprocess 6,000 MT of irradiated fuel over the first 10 years of its life.

*The authors are consultants with International Energy Associates Limited in Washington D.C. This article is the first of an occasional series on international nuclear waste management issues that will be featured in **The Radioactive Exchange.**

Sellafield Problems

Public interest in the activities at Sellafield remained in a somewhat low key until November 1983, when an inadvertent leak-age of radioactive material from the plant into the Irish Sea resulted in some contamination of nearby beaches. The media and political reaction to this spill was quite substantial and sensitized the public to the dangers of radiation. One result was the decision of the health authorities to temporarily close the beaches until they could be cleaned up. Following the furor that accompanied this decision, the government decided to prosecute BNFL. The company was found guilty on several counts relating essentially to bad management practices and for failing to keep their discharges "as low as reasonably achievable." BNFL was given only minor fines, but the ensuing loss of faith in the top management of the company has had far more serious and lasting implications. The spill happened to occur at the same time as a documentary on reprocessing was shown on national television in which it was alleged that there was an increased incidence of cancer in the area surrounding Sellafield, particularly among children. This drew further media attention to the plant and increasing public fears of radiation.

For a time following this incident public interest in the reprocessing plant at Sellafield began to wane but was rekindled in late 1985 by two events. The first was the occurrence of four minor leaks of radioactive material in quick succession during the last weeks of 1985 and the early part of 1986. Two of these involved small quantities of plutonium that contaminated a few members of the BNFL workforce. The second was the leaking to the news media of sections of a draft report being prepared by a Select Committee of Parliament on reprocessing and nuclear waste disposal. According to accounts published by the media, the draft called for a termination of reprocessing and termination of the construction of THORP. The release of the draft naturally magnified media attention and public concern over the leaking of radioactive material from the plant.

Select Committee Report and Responses

The Select Committee's report was finally published on March 12, 1986. It called for a fresh examination of the economics of spent fuel reprocessing to see whether the government should abandon current activities or future plans. It also recommended that an analysis be undertaken of the cost of dry-storage of spent Magnox fuel.

The report also called on BNFL and the U.K. Department of Energy to carry out a joint study of the financial consequences of abandoning THORP and an examination by BNFL and the Department of Employment to see if there are ways to redeploy the manpower involved in building THORP. If the results of these studies show that the project does not warrant continuing, it should then be abandoned.

Among the many conclusions of the Select Committee are the following:

- The committee is "convinced that final safe disposal routes are available in the United Kingdom";
- Britain should strengthen its research effort in radwaste management, which has fallen behind other nuclear nations;
- Britain's current shallow depository for low-level radwastes is not an acceptable model for any future disposal site; and
- If Britain cannot persuade other nations that sea dumping is safe, "it might be unwise" to retain this option.

Both BNFL and the Central Electricity Generating Board (CEGB) responded to the Select Committee report in separate press statements in which they agreed to carry out the examinations recommended in the report but made it clear they had entered into commitments which they intended to fulfill.

The CEGB statement, in particular, made clear the Board's commitment to THORP. It pointed out that AGR fuel, once stored in water for prolonged periods, must be reprocessed in due course. For that reason among others, the CEGB has consistently supported the construction of THORP. Moreover, the CEGB made a commitment many years ago to the use of the THORP facility to reprocess spent fuel from AGR power stations and it has followed through on that commitment by signing the contract in 1986.

The British government said that it would consider the Select Committee's recommendations and would respond to them in due course. The normal procedure is for the Government to set out its response in a "White Paper," which, in this case, was ultimately published in July 1986.

The Government's response in the "White Paper" makes it clear that a large majority of the Select Committee's recommendations are not acceptable or are already in place. However, the Government points out that to abandon THORP would have very serious economic and unemployment consequences. It states that, "The Government remains firmly committed to THORP.... There can be no question of abandoning the project. Reprocessing is a proven and safe technology which keeps open the possibility of re-cycling valuable uranium and plutonium as fuel."

On the question of waste disposal the Government welcomes the Select Committee's conclusions that safe disposal routes are available in the U.K. and agrees that indefinite storage presents unacceptable risks. It agrees, moreover, that while decisions on precise disposal sites are difficult, they should not simply be left to future generations.

Nevertheless, the Government disagrees with many of the Select Committee's recommendations and sets out in the White Paper its objectives for the management of radioactive waste in the U.K. as follows :

- All practices giving rise to radioactive wastes must be justified;
- Radiation doses resulting from radioactive wastes should be kept as low as reasonably achievable, economic and social factors being taken into account;
- The effective dose equivalent from all sources other than natural background radiation and medical procedures to representative members of a critical group should not generally exceed 100 mrem per year.

Coincident with the White Paper, a response to the Select Committee's report was also published by the nuclear industry, prepared jointly by the CEGB, the South of Scotland Electricity Board, BNFL, the United Kingdom Atomic Energy Authority and UK Nirex Ltd. On the question of the disposal of high-level waste, the industry points out that it had been criticized by the Royal Commission on the Environment in 1976 (the Flowers Report) for setting aside waste treatment and disposal for consideration at a later date. The Government had responded to that criticism by stepping up the waste research program with the object of having an operational HLW facility early in the next century. The industry points out that it did not agree on the urgency to dispose of packaged waste, a position which it still holds today. Nevertheless, it did support the increased level of research into the properties of suitable host geologic formations. Consequently, when the Government later cancelled the program of field research in response to public opposition and its realization that there were sound technical arguments for delaying actual disposal, this was not supported by the industry who wanted to see the research continued but not the commitment to actually dispose.

The industry points out that the long-term approach to disposal put forward by the Select Committee is the exact reverse of that advocated by the Royal Commission, and stresses that if progress on waste management is to be made, consistency in political judgement is required. However, it accepts the Committee's criticism regarding its failure to have expressed its point of view to the Government on the timing of disposal.

The Future

The controversy over the Select Committee's report is still continuing and there are as many questions unanswered following its publication as there were before. The Government, however, has firmly stated its commitment to THORP and this project is expected to proceed as planned. But it is still unclear what eventual direction the British waste disposal program will take. Clearly the industry sees no technical reasons for rapidly implementing a deep disposal strategy, and is leaving to the Government the decision as to whether such a strategy should be implemented sooner rather than later for social or psychological reasons.

Should it decide to proceed, the Government will clearly need to take account of one particular criticism which the Select Committee made and which the industry accepts. That is the gap which exists between the industry's and the public's perceptions of radioactive waste disposal matters. The industry agrees that it has failed to explain its activities in a manner that the public can understand. If a sensible waste disposal program is to be developed, both the industry and the Government will need to address this problem and it is noteworthy that the industry has already started on a course of action designed to achieve a better public understanding of nuclear matters in general. Although the Select Committee's report may not lead to any substantive changes in the U.K. program, this new approach may be one positive result of the report and the subsequent controversies which have emerged. **

UPDATE

STATUS OF UPCOMING REPORTS AND MILESTONES OF THE OCRWM
(9/12/86)

Proposal for Defense Contribution to the HLW Fund -- (9/22/86)

Release for comment of Draft Amended Mission Plan, to Reflect Decision to "Delay" Program to select Site for Second Repository,) 9/86

Submit Amended Mission Plan to Congress -- 10/86

Issue OCRWM Safety Plan -- 9/86.

MRS Proposal -- Submission to Congress prohibited by Court Order. Oral arguments in Sixth Circuit Court of Appeals heard on July 24.

Transportation Institutional Plan -- Issued 8/11/86.

Announce Licensing Support System design and implementation procurement in Commerce Business Daily -- 8/11/86.

Begin licensing support system document collection -- 10/86.

Issue Program-Level Financial Assistance Guidelines -- (Draft issued mid-July)

Issue Request for Proposal (RFP) for Transportation Cask Development -- Issued 7/86.

Issue Annual Update of Spent Fuel Storage Requirements Report -- 9/86.

Complete Annual OCRWM Quality Assurance assessment -- 9/86.

IN THE CONGRESS

HLW APPROPRIATIONS Floor action on the Senate version of the Energy and Water Appropriations bill, including funding for the HLW program, as reported out by the Full Appropriations Committee on August 13, (See EXCHANGE, Vol. 5, Special Edition, Aug. 15), is very unlikely according to Senate staffers. In lieu of a separate bill, the Senate is expected to include the Energy Water Appropriations in a Continuing Resolution, then conference with the House. The most likely outcome will probably be an Appropriations for the HLW program of somewhere between the Senate Appropriations Committee level of $380 million and the House recommendation of $650 million, which was overwhelmingly adopted on the House Floor.

PRICE-ANDERSON REAUTHORIZATION The Senate staffs of the Energy and Natural Resources and Environment and Public Works Committees have yet to meet on drafting a staff proposal reconciling the differences between the two Committee versions of the Reauthorization legislation as this edition went to print. However, a proposal to reconcile the three House versions has been developed by the House Interior and Energy and Commerce Committee staff.

The current thought of the House staffers regarding nuclear waste activities is to propose language that would provide for unlimited liability for nuclear incidents related to waste activities for a period of two years following enactment of the Reauthorization bill. During that two year period Congress would have the opportunity to adopt legislation establishing a specific victims' compensation liability plan. If no specific law is adopted within that time period, the victims of an accident resulting from nuclear waste activities would be vested with the right to claim "unlimited liability" on the part of the Federal Government. This seems to be the predominate proposal being supported by Interior and Energy staff. No view has been voiced by the Science and Technology Committee. However, all aspects of the staff reconciliation draft are yet to be fully discussed with their respective Chairmen.

IN THE NRC

HLW Definition The EXCHANGE has confirmed that a new staff proposed definition of High Level Nuclear Waste is currently ready for review by senior management staff. The new proposal takes into account the provisions of the Low-Level Radioactive Waste Policy Amendments Act stipulating that all waste above currently designated Class C waste is the responsibility of the Federal Government. The net result is that the redefinition will not have any effect on the waste to be accepted at commercial LLRW disposal facilities. The effect of any reclassification will primarily be felt by DOE.

A prime concern of the Department will be transuranic wastes and other waste currently managed at federal facilities such as Hanford. Management review of the staff draft is expected to be completed by the end of September.

IN THE OCRWM

Several top level personnel changes are occurring within the Office of Civilian Radioactive Waste Management. Bill Purcell, Associate Director of the Office of Geologic Repositories, has retired -- a move that was not unexpected. Tom Isaacs, who was Director of the Repository Coordination Division, has been moved up to become the Deputy Associate Director of this office. This is a newly created position. The possibility remains that another Associate Director may opt to retire but the EXCHANGE was unable to confirm the move.

Bob Purple, formerly the Deputy Director of the Office of Policy and Outreach who retired on July 31 is expected to be replaced by Jerome (Jerry) Saltzman. Jerry is now the Assistant Director of NRC's State Programs Office. DOE would neither confirm nor deny the appointment.

Though no specific individual has been identified as the replacement for Mr. Purcell, there is a considerable probability that "a senior official from Westinghouse" is in line for the position. **

REPORTS OF NOTE (LLRW)

LOW-LEVEL RADIOACTIVE WASTE FROM COMMERCIAL NUCLEAR REACTORS: VOLUME 2. TREATMENT, STORAGE, DISPOSAL, AND TRANSPORTATION TECHNOLOGIES AND CONSTRAINTS. Prepared by Sargent & Lundy Engineers, Chicago, Ill, 60603, for Oak Ridge National Laboratory, Oak Ridge, TN 37831. The overall task of this program was to provide an assessment of currently available technology for treating commercial low-level radioactive waste (LLRW), to initiate development of a methodology for choosing one technology for a given application, and to identify research needed to improve current treatment techniques and decision methodology. The resulting report was issued in four volumes.

Volume 2 discusses the definition, forms, and sources of LLRW; regulatory constraints affecting treatment, storage, transportation, and disposal; current technologies used for treatment, packaging, storage, transportation, and disposal; and the development of a matrix relating treatment technology to the LLRW stream as an aid for choosing methods for treating the waste. Detailed discussions are presented for most LLRW treatment methods, such as aqueous processes (e.g., filtration, ion exchange); dewatering (e.g., evaporation, centrifugation); sorting/segregation; mechanical treatment (e.g., shredding, baling, compaction; thermal processes (e.g., incineratio, vitrification); solidification (e.g., cement, asphalt); and biological treatment.

LOW-LEVEL RADIOACTIVE WASTE FROM COMMERCIAL NUCLEAR REACTORS: VOLUME 3. BIBLIOGRAPHIC ABSTRACTS OF SIGNIFICANT SOURCE DOCUMENTS (ORNL/TM-9846/V3&P1); Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831. Volume 3 of the low-level radioactive waste (LLRW) treatment assessment series represent a collated collection of abstracts from most of the papers and reference documents used in this study of LLRW treatment methodologies. The volume is published as two separate documents. Part 1 contains general literature abstracts concerning most aspects of low-level waste treatment, packaging, storage, transportation, and disposal. To facilitate reference use, a limited keyword index is included in Part 1. Part 2 was prepared by personnel from Sargent & Lundy Engineers and deals more specifically with regulatory constraints affecting treatment, storage, transportation, and disposal. Each section of part 2 includes a serial listing of document abstracts to expedite the location of a particular abstract.

LOW-LEVEL RADIOACTIVE WASTE FROM COMMERCIAL NUCLEAR REACTORS: VOLUME 4. PROCEEDINGS OF THE WORKSHOP ON RESEARCH AND DEVELOPMENT NEEDS FOR TREATMENT OF LOW-LEVEL RADIOACTIVE WASTE FROM COMMERCIAL NUCLEAR REACTORS (ORNS/TM-9846/V4) Oak Ridge National Laboratory, Oak Ridge Tennessee 37831. This is the fourth volume of the four volume set. As part of the program, a workshop was conducted for determining research and development needs in LLRW treatment. This workshop report includes the formal presentations and both panel and general discussions dealing with such issues as disposal, compaction, and the "below regulatory concern" philosophy. Summaries of individual workshops dealing with specific aspects of LLRW treatment are presented.

Calendar

September

14-18 International Conference: Low-, Intermediate-, and High-Level Waste Management, Decontamination and Decommissioning; Hilton, Niagara Falls, NY; Spons.: ANS; Contact: John L. Knabenschuh, West Valley Nuclear Service, Box 191, West Valley, NY 14075, (716) 942-4295; TLX: 812390, or ANS Meetings Dept. (312) 352-6611.

18 Meeting: Midwest Compact Commission Management Plan Committee; Milwaukee Airport Conference Room #221, 5300 South Howell Avenue, Milwaukee, Wisconsin, 10:30 a.m.; Contact: Susan Olsson (612) 293-0126.

23-25 Meeting: Doe 8th Annual Low-Level Radioactive Waste Forum; Denver, Colorado.

23-25 Seminar: Packaging and Transportation of Radioactive Waste Material; Richland, WA; Spons: US Ecology; Regis: $525; Contact: Peggy Thompson, (800) 626-5334.

24 Meeting: Western Legislative Conference; High Level waste Subcommittee Meeting; Colorado Springs, CO; Contact: Patty Spangler (415) 986-3760.

October

1-3 Conference: HAZ MAT Trans EXPO Safety Conference; Spons: Hazardous Materials Advisory Council (HMAC) and the American Trucking Assoc. (ATA); Meadowlands Hilton, Secaucus, NJ: Registration: $295; Two or more people from same company - $275 each; Exhibit space available: $400 per 8'x10' booth. Contact: HMAC, 1012 14th Street, NW, Suite 907, Washington, D.C. 20005; Gail Stanton, (202) 783-7460.

3 CONGRESS ADJOURNS FOR ELECTIONS.

5-8 Workshop: Radiation Issues; Boston, MA; Spons: Atomic Industrial Forum, Inc.; Contact: AIF (301) 654-9260.

13-17 Seminar: Management Options for Low and Intermediate Level Wastes in Latin America; Rio de Janeiro, Brazil; Contact: International Atomic Energy Agency.

19-22 The High-Level Waste Business--Transportation, Storage, and Disposal; - Charleston, S.C.; Spons: Atomic Industrial Forum; Contact: AIF, 7101 Wisconsin Ave., Bethesda, MD 20814-4805; (301) 654-9260.

20 Symposium: Low Level Rad Waste; NY and NE Health Physics Chapters; Hotel Thayer, West Point, NY; Contact: Carl Gogolak (212) 620-3635.

21-23 Workshop: Radioactive Waste Packaging, Transportation and Disposal; Sheraton Charleston Hotel, Charleston, SC; Spons: Chem-Nuclear Systems, Inc.; Registration Fee: $650 prior to Sept. 20, $750 after Sept. 20; Contact: Chris Achelpohl (803) 256-0450, ext. 321.

20-22 Seminar: High-Level Nuclear Waste Management; Radisson Mark Plaza, Alexandria, VA; Spons: Westinghouse Electric Corporation, Waste Technology Services Division; Contact: Dr. Yolanda Willis, (412) 722-5728.

22-23 OCRWM Meeting: Quality Assurance Coordinating Group; Columbus, OH; Contact: Carl Newton (202) 252-9300.

24 Meeting: Northwest Interstate Compact Committee; Honolulu, Hawaii; Contact: Elaine Carlin (206) 459-6244.

28-29 Meeting: LLRW Forum (The Organization of LLRW Managment State and Compact Officials); Austin, TX.

30 Seminar: Transporting Hazardous Materials and Waste Safely, Chicago Marriott O'Hare Hotel, Chicago, Illinois. Spons: Hazardous Materials Advisory Council (HMAC); Registration: $135 HMAC Members; $175 non-members. Contact: HMAC, 1012 14th St., NW, Washington, D.C., 20005; (202) 783-7460.

November

12-13 Conference; 4th Annual Fall Conference of the CA Radioactive Materials Mgmt Forum (CALRAD); Los Angeles Airport Marriot; Contact: Jean Parker (415) 647-3353

16-21 Meeting: American Nuclear Society Winter Meeting, Sheraton Hotel, Washington, D.C.; Spons: ANS; Technical Program Chairman, David L. Black, Westinghouse, 1801 K Street, N.W. - 9th Floor, Washington, D.C. 20006 (202) 835-2300; Contact: ANS Meetings Dept. (312) 352-6611.

16-19 Atomic Industrial Forum Annual Conference for 1986; Washington, D.C.; Contact: AIF (301) 654-9260.

19-20 Fourth Annual Midwest Workshop: "Low-Level Radioactive Waste Management: Implementing a Second Generation System"; Mariott Inn East, Columbus, Ohio; Spons: ERM-Midwest, Inc.; The Ohio Rad Materials Users Group (Inc.); Ohio Dept. of Health; and the OSU Nuclear Engineering Program; Registration Fee: $345 advance, $390 at the door; Contact: Brenda Higgins, 2000 West Henderson Road, Columbus, OH 43220, (614) 451-8406.

December

2-3 Seminar: Packaging and Transportation of Radioactive Waste Material; Raleigh, NC; Spons: US Ecology; Regis: $425; Contact: Peggy Thompson, (800) 626-5334.

1987

January

21-22 OCRWM Meeting: Quality Assurance Coordinating Group; Albuquerque, N.M.; Contact: Carl Newton (202) 252-9300.

February

9-11 Conference: 2nd Annual Topical Conference on Nuclear Waste Management Quality Assurance; Las Vegas, NV; Contact: Judy Kail (619) 455-2627.

(Changes from previous calendar in bold print)

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