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BEFORE THE  
EIGHTH ANNUAL RADIOACTIVE EXCHANGE  
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LOW-LEVEL RADIOACTIVE WASTE DISPOSAL:  
IS THERE NUCLEAR LOW-LEVEL WASTE GRIDLOCK AHEAD?

I'm delighted to have been invited to the Radioactive Exchange's Eighth Annual Low-Level Radioactive Waste Decisionmakers' Forum. It is a pleasure to have this opportunity to speak with you at the outset of this important and timely meeting. This Forum and meetings like it help foster the open and honest communication that must take place if we are to work together to achieve progress toward lasting solutions.

It is in this context that I want to share with you today the Nuclear Regulatory Commission's perspective on the importance of continued, safe low-level waste disposal, and review some of the actions that we are taking to provide a sound national regulatory program.

NRC'S PERSPECTIVE ON LOW-LEVEL WASTE DISPOSAL

To begin with, we must all recognize the existence of a strong, fundamental link between the use of nuclear materials and safe disposal of nuclear waste. For many years there has been a pressing need for additional low-level waste disposal capacity. Indeed, problems surrounding low-level waste disposal have repeatedly been elevated to the Congress.

Many of you will recall the contentious atmosphere and temporary site closures that preceded enactment of the original Low-Level Radioactive Waste Policy Act in 1980. Enactment of this legislation was spurred by the strong objections of Nevada, South Carolina and Washington to the state of low-level waste disposal at that time. These objections went even to the extent of threats of permanent closure of all three operating disposal sites. The wishful goal of that legislation was the development of new disposal capacity, in other states, by 1986. Time and events proved this goal to be all too optimistic, and it was never even approached. Because of a lack of forceful

incentives, the Low-Level Radioactive Waste Policy Act of 1980 was probably doomed to failure from the beginning.

Congress again tried to solve low-level waste disposal problems with the Low-Level Radioactive Waste Policy Amendments Act of 1985. This Act was vigorously supported at the time by the National Governors Association and was unopposed in the U.S. Congress. In order to stimulate new site development more effectively, the Amendments Act relies heavily on the "carrot and stick" approach.

The 1985 Act's system of milestones for site development, with economic incentives and penalties based on progress made, has had mixed results as most of you are no doubt aware. There are several admirable success stories, where site development is proceeding to an effective solution, although perhaps more slowly than desirable -- and there are certainly failures, where no promising arrangement for waste disposal is either on the horizon or even being aggressively pursued.

Meanwhile, the three sites that were operating safely and economically in 1980 continue in operation today. They provide a convincing demonstration that low-level waste disposal can indeed be accomplished in a manner fully protective of the public and the environment. It is truly remarkable that all 50 states combined are having so much difficulty finding sites for the million or so cubic feet per year of waste being generated today, when these three sites alone were accepting over twice that much in 1980. Piled on a single football field, a million cubic feet of waste would be only about two-stories high.

Repeatedly, the public has demanded effective solutions to nuclear waste disposal problems. Where progress has been made and where solutions have been achieved, it has only been through openness, commitment and perseverance. It has been proven time and time again that public acceptance of waste disposal sites can only be won through strong communication, information and education efforts.

Those States and Compacts responsibly attempting to move forward with siting, design and licensing for new sites have all faced public opposition and legal challenges. These have universally presented formidable obstacles to meeting milestone deadlines. In some cases they have been overcome, while in others, they have proven insurmountable. I believe the record shows that where there has been a willingness to deal with the public openly and honestly, and an effort has been made to communicate the genuine need to act responsibly for the public good, progress in low-level waste siting has been achievable. It is those programs in which there has been a strong and sustained commitment that have achieved real progress. These programs demonstrate that it is possible to address successfully waste disposal issues that are not only highly controversial, but

generate genuine fear and concern among the public. Even in these successful programs, a variety of unanticipated difficulties have resulted in delays. However, even substantial delays are tolerable where there continues to be confidence that disposal capacity will be provided.

In other cases, where the resolve to face the public and to deal responsibly with waste disposal needs has wavered or been lacking, a great deal less progress has been made. In some instances, the result has been outright program stagnation. The effect of this is to cast great uncertainty on the future ability to provide for disposal of nuclear waste, and equally great uncertainty on the ability of nuclear materials users to continue to contribute to the public well-being.

At this time it does not appear that any new site will be in operation by January 1, 1993. This means that waste from States that are not members of Compacts with operating sites can be legally excluded from all the operating sites. Alternatively, waste generators might be forced to pay outrageously high waste disposal fees. Consequently, less than seven months from now, many waste generators may face an effective loss of access to the three active disposal sites. Except for the most advanced site development programs, it could be several years before new sites are brought on line.

On a positive note, the South Carolina State legislature just last week voted to keep the site at Barnwell, South Carolina, open beyond 1992. However, this is subject to terms and conditions the effect of which is yet to be determined, such as linkage to progress in North Carolina and the fee structure. It is still very uncertain what this will mean for waste generators across the country. At this time it is not clear whether or for how long the site might remain a viable disposal option for out-of-compact waste. Furthermore, current plans are to close Barnwell permanently by January 1, 1996.

Consequently, interim waste storage, as a widespread and routine mode of operation, may sooner or later be at least a temporary necessity if operations at many nuclear facilities are to continue. This would be a highly undesirable result. We at the NRC continue to believe, for health and safety reasons as well as for policy reasons, that storage is not an acceptable substitute for disposal, and that extended storage should be avoided if at all possible.

Even though interim waste storage can provide a safe temporary solution in most cases, the lack of adequate low-level waste disposal capacity will eventually have serious consequences. These ill effects will arise not only for waste generators, but for the public at large. If the lack of disposal capacity creates waste gridlock in the nuclear industry, I

believe the industry's credibility with the public will suffer serious damage.

In the short term, it is the smaller materials users that are likely to be most affected, due to a lack of alternative storage capacity. This could lead, for example, to unfortunate impediments to nuclear medicine and medical research, well recognized and vital components of our nation's health care system. These medical and research applications number well into the millions each year and have proven to be vitally important to proper patient care. Their contribution to our national well-being is significant and pervasive. In the much longer term, a lack of disposal capacity could even begin to interfere with commercial power reactors through a damaged public image. Fortunately, most utilities' ability to store low-level waste on site is already substantial, and can be significantly and safely increased if necessary.

Another area that could be adversely affected is decommissioning. Any extended lack of waste disposal facilities could seriously impair our ability to proceed with the timely cleanup of a number of contaminated nuclear materials sites. This would serve to aggravate further a situation which has already caused serious concern, in Congress and elsewhere, and to perpetuate unnecessarily the hazards entailed by such facilities. This too would lead to a further erosion both of the industry's credibility and of the public's confidence.

The obvious conclusion is that new disposal capacity for radioactive low-level waste is essential. The need must be recognized, it must be faced, and it must be satisfied.

Having said that, I want to emphasize that under the terms of the Amendments Act, low-level radioactive waste disposal site development is clearly the responsibility of the States, not the Nuclear Regulatory Commission. We nonetheless hold a high interest in the outcome of site development efforts, because of the health and safety ramifications for licensees we regulate, and because of our strong concern for the common good.

Lest we lose heart, we should recognize that there are numerous examples of what can be accomplished in the waste management area. Here, success demands that needs are recognized and a responsible approach is taken, an approach that provides for adequate communication with the public, facing public concerns squarely. The low-level waste disposal site efforts in California, Illinois, Nebraska, and Texas are all highly commendable examples where such an approach has been taken.

The nation of Sweden, which I had the pleasure of recently visiting, is another excellent case in point. Sweden is a country of under nine million people, the majority of whom have expressed disenchantment with nuclear power. They have 12 power reactors

which currently produce about 45 percent of their electrical energy. In 1980, by a public referendum followed by a parliamentary decision, the Swedes opted to begin dismantlement of all 12 reactors by the year 2010. Plans were laid to begin to decommission two plants by the end of 1996, although this may be revised. Yet even in this highly nuclear-conscious environment, waste management and disposal needs have been addressed openly and squarely, supported by strong public information efforts. The results are clear. In 1985, Swedish utilities put into operation a facility for storage of spent nuclear fuel, and in 1988, a facility for permanent disposal of low and intermediate level nuclear waste. Plans are set for putting a spent fuel disposal site in operation by the year 2020.

The Swedish low-level waste disposal site is a major construction in solid granite rock, with an elaborate combination of tunnels and ventilation systems leading to immense man-made caverns. On seeing it, I was highly impressed with the evident high level of management and technical skills devoted to the project. I believe that Sweden's public information campaign contributed substantially to this success in gaining public support for the project.

Another example that I want to take note of is our own U.S. Department of Energy. DOE faces an enormous environmental cleanup obligation, and public recognition of the vastness of DOE's cleanup needs has been accompanied by a tremendous outcry of public shock and indignation. While we are well aware of DOE's problems and shortcomings in this regard, we must consider where they were 10 years ago and how far they have come. As the realization of the immensity of this task has set in, DOE has not shied from its cleanup responsibility. They have made a strong and visible effort, albeit with much prompting along the way from the U.S. Environmental Protection Agency, among others. Now they are beginning to take large strides in coming to grips with their ongoing waste management needs and the waste residues of decades of weapons production and other non-defense programs. If studied for any length of time, the enormity and intractability of DOE's cleanup problems simply boggle the mind. The DOE budget request for fiscal year 1993 alone, for its environmental restoration and waste management program, is in excess of five billion dollars. This is a staggering figure, especially in comparison to the minuscule funding devoted to these same programs only a decade ago, and is another indication that they are resolutely pushing ahead.

I firmly believe the DOE program demonstrates that the Federal government is willing to bear its responsibility for safe and timely waste management. The program reflects a new attitude of conscientiousness and a willingness to confront problems head-on. I also believe that is what it will take for some of our lagging States and Compacts to carry out their assigned roles under the Low-Level Radioactive Waste Policy Amendments Act.

## NRC'S REGULATORY INITIATIVES FOR LOW-LEVEL WASTE DISPOSAL

To assure that regulatory problems don't stand in the way of safe and effective low-level waste disposal, we at the NRC have continued to take vigorous action to strengthen and focus our regulatory program. Our basic disposal site licensing regulations were put in place almost a decade ago with the Commission's adoption of the original 10 CFR Part 61, in December 1982. Since then, the Commission has issued a continuing series of important supporting documents to provide needed implementation guidance. We are quite confident that 10 CFR Part 61 and its supporting documents provide a sound regulatory basis for licensing low-level waste disposal sites. As confirmation of this, the Commission is in the process of amending Part 61 to clarify its applicability to alternative disposal methods, such as above-ground concrete vaults.

## TAKE-TITLE PROVISIONS

Our regulatory responsibilities were further increased by several elements of the Low-Level Radioactive Waste Policy Amendments Act. The Commission's longstanding commitment to uphold the letter and the intent of the Amendments Act was the subject of a recent speech given by Commissioner Forrest J. Remick at the Waste Management '92 conference in Tucson, Arizona. The Commission is equally committed to supporting the Amendments Act's title and possession provisions that are now under challenge before the U.S. Supreme Court, as long as those provisions remain the law.

With this in mind, earlier this year the Commission directed the NRC staff to prepare a proposed rule to minimize reliance on waste storage after January 1, 1996. The Commission's objective here is two-fold. The rule would improve health and safety protection by minimizing reliance on storage, and it would highlight that the goal of the Amendments Act is to provide for disposal of low-level waste. The rule would operate by requiring waste generators who store wastes onsite after January 1, 1996, to maintain documentation demonstrating that all other reasonable waste management options had been exhausted, including asking the State to take title to and possession of stored wastes pursuant to the Amendments Act.

The Commission is, of course, following the Supreme Court's review of these provisions of the Amendments Act. We are also monitoring activities among the States and Compacts. If appropriate or necessary, the Commission will revise its proposed course of action. The proposed rule has been forwarded to the Commission but will not be issued for public comment before the Court's decision, which we expect shortly.

## RETURN OF PROCESSED REACTOR WASTE

Another recent and important NRC regulatory initiative addresses low-level waste storage at power and non-power reactors. These licensees routinely use off-site services for waste treatment and volume reduction. Because reactor licenses do not currently authorize receipt of waste from off-site sources, these operators are now, or may soon be, forced to store waste on-site without the benefit of off-site processing or volume reduction. To alleviate the unnecessary burdens associated with this situation, the Commission proposed, in April of this year, to modify the regulations governing power reactors. The proposed rule would allow reactor licensees to receive back on-site low-level radioactive waste that was generated at the site but sent off-site for processing or volume reduction. This action, when completed, will provide reactor licensees with much greater flexibility in managing their low-level waste until permanent disposal capacity is available.

#### SUMMARY

In summary, it is the medical and industrial radiological activities that benefit all of us that will be the first to suffer if adequate waste disposal capacity is not provided. In contrast, our reactor licensees have large sites and large budgets and an array of options not available to most others. Those that do suffer from lack of disposal capacity will do so at the expense of others. Those States in Compacts with productive disposal siting efforts will reap the benefits for their citizens -- the benefits of safe waste disposal, continued availability of important nuclear materials services, and the assured ability to exclude waste from non-Compact origin.

This concludes my review of the NRC's views on the necessity of new low-level waste disposal capacity, and the NRC's major low-level waste regulatory initiatives. A summary of other significant Commission actions with respect to low-level waste is included as an addendum to the written text of this speech.

In closing, I challenge you to think positively, and to continue to work toward solutions. The future may be uncertain, but the need for new low-level waste disposal capacity is not. Progress in new site development will never be easy, but it is achievable. Openness, persistence, and strong support are the keys to success. The Commission stands ready and willing to work with you to meet our common goals.

I thank the Radioactive Exchange for this opportunity, and all of you for your time and attention.

ADDENDUM TO REMARKS BY IVAN SELIN  
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ADDITIONAL NRC REGULATORY INITIATIVES IN LOW-LEVEL WASTE  
NOT ADDRESSED IN CHAIRMAN SELIN'S SPOKEN REMARKS

The NRC has a substantial and continuing effort to further develop the regulatory program for low-level waste. The topics addressed below are all important ongoing efforts. They well deserve mention in this paper despite my not having time to include them in the oral presentation.

Below Regulatory Concern --- Decommissioning Cleanup Criteria

The Low-Level Radioactive Waste Policy Amendments Act called on NRC to set standards and procedures for processing petitions to exempt specific waste streams from regulation as being "below regulatory concern." In August 1986 the Commission issued a policy statement containing criteria that, if satisfactorily addressed in a petition for rulemaking, would allow the Commission to provide exemptions on a practice-specific basis. This was followed in July 1990 by issuance of the Commission's Below Regulatory Concern Policy. This policy was intended to provide a unifying risk basis for decisionmaking on deregulation of very low levels of radioactivity. Use of the policy was contemplated for a variety of applications concerned with very low levels of radioactivity. These included waste streams, consumer products, materials recycle, and decommissioning. Due to the strong adverse reaction to this policy by the public and Congress, however, the Commission has not proceeded with implementation, and has instead decided to hold the policy in abeyance indefinitely.

In the interim, we plan to conduct individual rulemakings as necessary. The first such rulemaking will implement a series of public workshops in order to greatly increase opportunities for early and substantive participation by interested parties. The goal of this effort is to establish decommissioning cleanup criteria for lands and structures in NRC regulations. Current schedules call for the workshops to begin this September and be completed by February of next year. A proposed rule should be ready for issuance by the latter part of next year.

## Performance Assessment --- Determining Compliance With Part 61

Another area where NRC has substantial effort in progress is performance assessment, a linchpin in the licensing process. Over the last several years, the NRC has devoted significant resources to development of performance assessment methods. Both license applicants and application reviewers will use such methods to evaluate compliance with the performance objectives contained in 10 CFR Part 61.

In 1989 and 1990, Sandia National Laboratory, under contract with NRC, issued a five-volume report providing a detailed performance assessment methodology. Plans for the future include refinement and expansion of current methods to provide greater versatility. Also, a staff technical position on performance assessment is scheduled to be completed later this year.

NRC has also addressed the need for accurate source term data for use in performance assessments. A proposed rule requiring the reporting of fundamental information on low-level waste shipments was issued last April, and we have arranged for disposal site waste receipt data to be made available to NRC staff for analysis and reporting. The proposed rule also provides for a uniform low-level radioactive waste manifest. The uniform manifest will not only satisfy the NRC's data needs, but also fulfill U. S. Department of Transportation requirements for shipping paper information, and State and Compact needs for tracking waste origins. The information to be obtained under the proposed rule will enhance both the precision and completeness of available waste disposal data. This will measurably improve the data that can be used to assess the performance of low-level waste disposal facilities, and allow better estimates of future waste disposal needs.

### Mixed Waste and Greater-Than-Class C Waste

Two types of low-level waste continue to present special waste disposal problems. These are mixed waste, which must be disposed of in accordance with both NRC and U. S. Environmental Protection Agency requirements, and waste exceeding the Class C limits provided in 10 CFR Part 61.

In the mixed waste area, we continue to work with EPA to address the concerns presented by joint regulation. We were recently able to issue a draft of our fourth NRC/EPA joint guidance document for comment. It focuses on required waste testing under EPA regulations. The draft guidance emphasizes the need for recognition of radiologic hazards, and the use of techniques and procedures to minimize radiation exposure. These include the use of surrogate materials, smaller sample sizes, and reliance on process knowledge in waste characterization. Our next joint guidance document will address mixed waste storage requirements.

In a separate effort, NRC and EPA are nearing completion of a National Profile on mixed waste to better define mixed waste generation rates, characteristics, and treatability. An initial report will be available later this year. Preliminary data are being presented by an NRC staff member at this meeting.

Another encouraging development concerning mixed waste was EPA's issuance last month of proposed approaches to amend their Resource Conservation and Recovery Act (RCRA) regulations. The changes being considered would, for some waste constituents, set concentration-based limits. For these wastes, which are currently subject to regulation by EPA under RCRA with no concentration threshold, the amended rules would replace the so-called "derived-from" and "mixture" rules. Relief would be predicated on a finding that waste no longer regulated under RCRA would be adequately controlled under some other regulatory regime, such as EPA's solid waste regulations.

Responsibility for disposal of greater-than-Class-C (GTCC) waste was assigned to the U. S. Department of Energy by the Amendments Act. Since then, the NRC has encouraged DOE to take the actions necessary to put in place a program to provide for acceptance of GTCC waste from commercial sources.

#### Alternative Disposal Methods

Another NRC responsibility under the Amendments Act is the identification of methods for low-level radioactive waste disposal other than by shallow land burial, and issuing technical guidance for the licensing of facilities using such methods. The NRC has fulfilled this obligation by issuing several technical reports and guidance documents, and by updating our standard review plans to provide the information called for by the Amendments Act. In addition, the NRC is in the process of amending 10 CFR Part 61 to clarify its applicability to alternative disposal methods, such as above-ground concrete vaults and earth-mounded concrete bunkers.

Another disposal alternative that has been proposed is to allow for disposal of certain wastes in uranium mill tailings impoundments. NRC has reviewed several such proposals in the past and recently concluded that under certain conditions such disposals may well be justified. As a result, the Commission has issued draft guidance for determining the acceptability of such proposals. It was published in a Federal Register notice for public comment just last month.