The original documents are located in Box 25, folder "Nuclear Waste (2)" of the James M. Cannon Files at the Gerald R. Ford Presidential Library.

THE WHITE HOUSE

WASHINGTON

May 18, 1976

MEMORANDUM FOR: RICHARD ROBERTS

FROM: GLENN SCHLEEDE

SUBJECT: NUCLEAR WASTE MANAGEMENT

Would you please look over these papers and then let me know whether:

-- they are an essentially correct assessment of the Nuclear Waste situation, and if not where an alternative assessment is more accurate;

-- the ERDA Waste Management program is dealing with the problems and opportunities described;

-- there should be any adjustments in the Nuclear Waste Mangement policies or programs of the various Federal agencies that should be considered?

Thanks for your help.

cc: Jim Cannon
Jim Mitchell

Attachments

Partitioning of Actinides from High-Level Wastes

The Purex process (based on solvent extraction processes) which is the only currently-developed method for reprocessing reactor fuel, recovers approximately 99.5% of the uranium, neptunium, and plutonium from the fuel. The transplutonic actinides (americium and curium), however, follow chemically with the rare earth fission products and end up in the waste. Removal of the actinides from the waste has been demonstrated by several methods on the laboratory-scale; however, a large amount of work and expense will be needed to select the best combination of chemical steps and to demonstrate feasibility in an integrated, high-radiation-level pilot plant. Recovery can either be accomplished by modification of the Purex process in the reprocessing plant or by allowing the high level liquid waste to decay for several years to reduce radiation damage to reagents, solvents, and ion exchange resins prior to removal of the transplutonics. A major problem is the recycle of intermediate level waste streams created in the process in order to minimize waste volume.

With scheduled reinstatement of funding at a total level of about $2 M/ year, it is estimated that three years will be required to establish feasibility and selection of methods to be used. An accelerated program may succeed in one year without raising the total expenditure to $10 M. The major cost and time element will involve scale-up of the process using hot waste. This is estimated to cost on the order of $200 M and would take between 5 and 15 years including regulatory delays and construction time leading to a full scale reprocessing plant. Because of the long time-scales involved in implementing this option, it is imperative that the technology be developed as quickly as possible.

It is estimated that adding actinide partitioning to fuel reprocessing will add about 25 percent to the 0.4 to 0.5 mill/kw-hr cost of fuel reprocessing.

A more radical modification of the actinide separation process* would be investigated for approximately three years at a cost of approximately $10 million. In the long run this may save money and may lead to better separation.

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*for instance, use of a chelating agent on even molten-tin extraction.

OKLO - A Natural Fission Reactor

In 1972 French scientists working with natural uranium mass standards found some samples that were low in the uranium-235 to uranium-238 ratio. These were traced back to their origin — the Oklo deposit in the southeast part of the Republic of Gabon in West Africa (formerly included in old French Equatorial Africa). Core samples from the ore body were as much as 50% depleted in uranium-235. It was clear, after ascertaining that the presence of rare earth fission products and the isotopic abundance of the rare earth stable fission product neodymium in the samples corresponded almost exactly to that expected from slow neutron fission of uranium-235, that the deposits had undergone one or more fission chain reactions in their history.

The most interesting aspect from the standpoint of radioactive waste disposal was that the location and amounts of many of the fission products were in nearly exact agreement with the depletion of uranium -235, indicating that the relative geometry of the reactors had remained largely intact and undisturbed during their approximately 1.8 billion year lifetime. Indeed, it is indicated that the plutonium formed in the reaction (although not measurable at the present time due to its radioactive decay) had not migrated detectably in times comparable to its 24,000 year half life even though there is strong evidence that water was present prior to, during, and after the decay of the plutonium. This presents strong evidence for the stability of geologic systems for storing radioactive wastes for a very long time. Scientists at Los Alamos, the Idaho National Engineering Laboratory, and the University of New Mexico are continuing to study this deposit and to search for other natural reactors and the relationship of ore deposit stability to long-term storage of reactor wastes.

Some facts about the Oklo reactors:

age - 1.8 billion years

burn-up - 15,000 megawatt-years

number of separate reactors - at least four; possibly six

duration - about 600,000 years

type reactor - water-moderated thermal

inferred average distance of travel: a few meters for most fission products in ~2 billion years; a few meters for plutonium in a few times 10,000 years; loss of most radioactive gases; probably a few miles in a few times 10 years for alkaline and alkaline-earth elements; no evidence on Americum. These travel rates include effects of irradiation of the soil and from the postulated circulation of water.

Low Level Waste

Land burial has been used since the days of the Manhattan project for disposal of low-level solid radioactive wastes. These comprise the largest fraction of the volume of waste. Most of these wastes are characterized by very low-levels of contamination (less than one curie/cubic foot). Packaging (ranging from cardboard boxes to shielded metal containers) prior to burial is dictated primarily by the need to prevent spread of contamination. Burial is in earthen trenches and pits selected for their geologic and hydrologic characteristics. Five ERDA and six commercial sites are utilized. ERDA sites are used to bury waste generated by ERDA facilities. Commercial sites receive wastes from the licensed nuclear industry, ERDA and non-fuel cycle sources. The latter include such sources as hospitals, medical laboratories, medical research facilities, other research facilities and industry. Currently, more than half the wastes at commercial disposal facilities are from non-reactor sources. This is projected to decline to 14% by the year 2000 as reactor operations increase.

Since 1970 all transuranium-bearing low-level wastes (level greater than 10 nanocuries/gram of waste) have been stored in a readily retrievable manner pending a decision on whether these wastes may need disposition in carefully selected disposal sites, such as deep geologic formations. Containers of these wastes are placed on an asphalt pad, covered with a plywood and a waterproof membrane, then covered with earth.

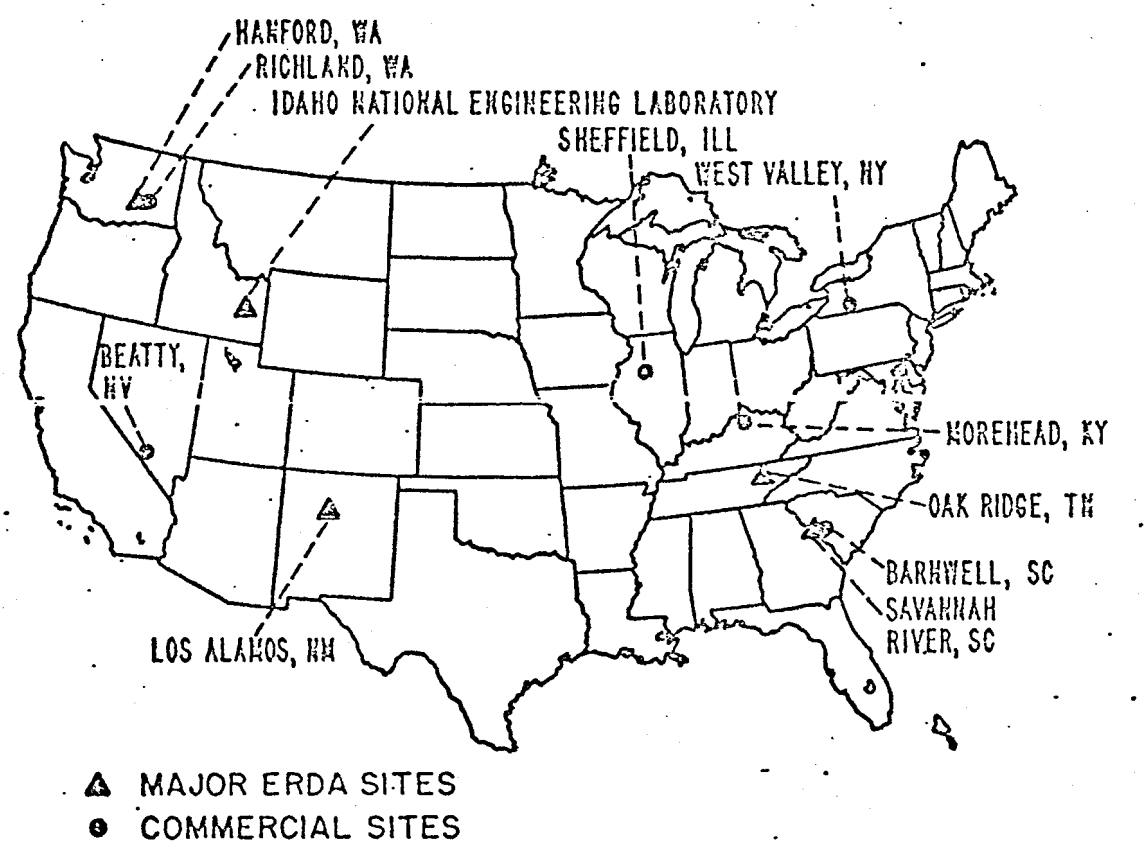
Some leakage of radioactivity and migration has been observed at several sites (a commercial site near Buffalo, New York, another in Kentucky, and at the ERDA facility at Oak Ridge). These have resulted primarily from water intrusion after backfilling coupled with leaching

and migration. Levels off-site have been below concentration guidelines, and corrective measures have been instituted.

Efforts have been instituted to improve burial operations, monitoring capabilities, flood and drainage control, etc.

Facilities, operational procedures, and monitoring capabilities should continue to be optimized to assure containment of the buried waste.

Experience from disposal of low level wastes has had the effect of improving the safety of handling low level activities from hospitals.



Low Level Waste Burial Site Locations
(See map on High Level Waste Storage Sites)

Transportation of Liquid Wastes

Liquid high-level radioactive wastes are not transported; they are stored in tanks at the point of origin. Regulations require that high-level commercial wastes be converted into an immobile solid form (within five years after their origin) for transportation to storage or repository sites.

With only a few exceptions, low-level wastes are put into dry, solid form prior to being transported. For the few that are shipped as liquid, they must conform to DOT regulations for shipment of any liquid radioactivity.

- Concentrations must be sufficiently low, such that if there is an accidental release, no one can conceivably receive a maximum permissible dose.
- If concentrations are above this level, the liquid must be placed in double-sealed containers and surrounded by sufficient material to absorb two times the amount of liquid present.
- Radiation levels on the outside surface of the container will be less than 200 mR/hr and at a distance of one meter will be less than 10 mR/hr.

Present Storage of High Level Liquid Wastes

In non-commercial nuclear plants (Hanford, and Savannah River, and in planned commercial Savannah River plants) high-level liquid wastes are (or will be) stored. In other commercial plants the spent fuel elements are stored at the reactor sites under water.

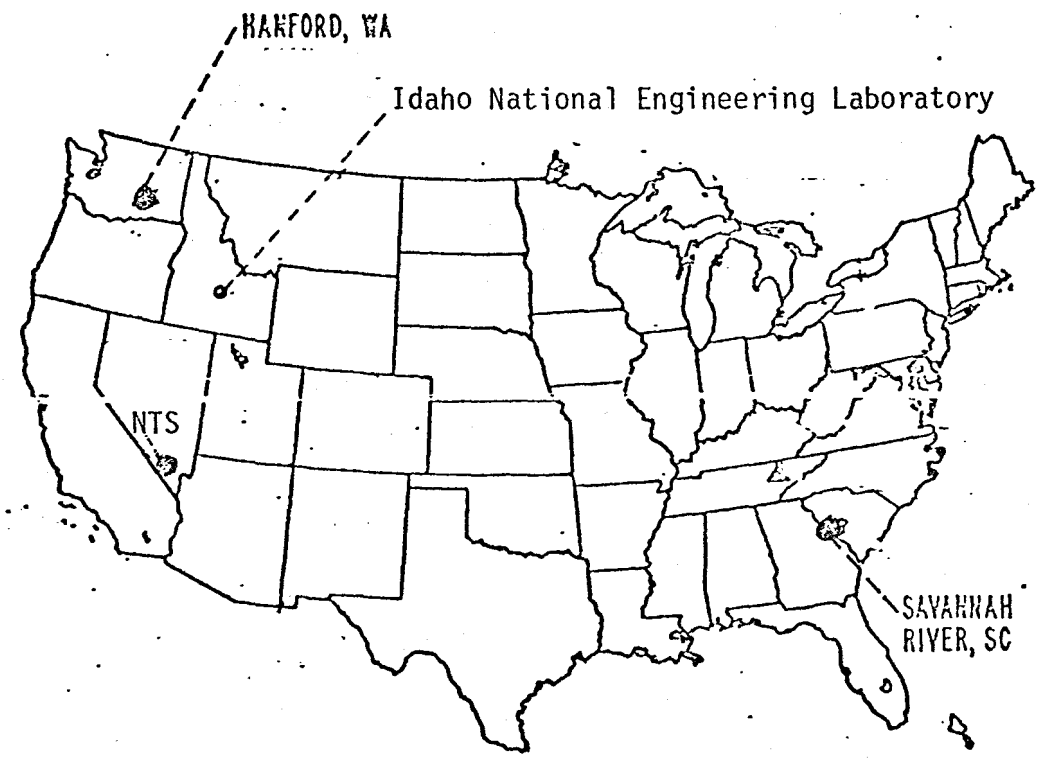
Since the late 1950's some 20 leaks have occurred in the aging underground tanks containing wastes from AEC production at the Hanford, Washington site. The worst took place in 1973 when 115,000 gallons were found to have leaked into surrounding sediments. The source of this leak was unknown, but as with most of the leaks, it was thought to result from corrosion of the 25-30 year old tank. Approximately 40,000 curies of cesium-137, 14,000 curies of strontium-90, among other fission products, as well as 4 curies of plutonium were found to have penetrated to as much as 89 feet below the surface and extended laterally about 150 feet from the tank. The radioactivity is sorbed on some 880,000 $feet^3$ of dry underground sediments, and is not moving; even if it reached the aquifer 115 feet below the deepest penetration of the waste, it would take more than 8000 years for the waste from this area to reach the Columbia River. Decay will render the waste innocuous before it could reach the river. It is therefore considered unnecessary to remove the immobile leaked waste since there is no danger of human exposure or migration out of the tank farm area. The situation is similar for the other Hanford leaks. Extensive monitoring programs are continuing to confirm the lack of movement by this radioactivity.

A program is currently underway at Hanford to immobilize the impounded radioactivity by taking all of the old accumulated waste within the tanks to dryness. This effort should be complete in about one year. Cesium and strontium radioactivities are removed from waste which is currently being

generated; the residue is then stored in double walled tanks. No leaks have occurred in these tanks.

Several other less serious leaks of stored liquid wastes have occurred at the Idaho National Engineering Laboratory and at the Savannah River Plant. Measures are underway to upgrade these storage systems; present equipment is being replaced with double wall pipes and tanks.

Current regulations require that commercial high level liquid wastes be put into a solid immobile form within five years after their generation. With careful site selection and well-designed storage tanks as well as strict management and monitoring, the short-term liquid waste storage consistent with these requirements should be safe and the problems of long-term storage of liquid wastes will be avoided.



High Level Waste Storage Site Locations

(See map on Low Level Waste Burial Sites)

Reprocessing Plant Off-Gas Treatment

A number of gaseous radioactive species are released in the opening and dissolving of fuel element rods at reprocessing plants. These are the rare gas krypton-85; tritium; iodine-129; carbon-14, as carbon dioxide; and some volatile forms of ruthenium isotopes. Two population groups vulnerable to exposure from these species must be considered. For those in the downwind sector from the reprocessing plant, individual exposures must be limited to an acceptable level. The more-volatile species, particularly krypton-85, tritium and carbon-14 will contribute to the worldwide pool of these radionuclides, and impacts on the exposed world population should be considered in the long run. It is quite possible that these impacts will turn out to be negligible.

Regulations will require operational controls to limit downwind exposures. Future worldwide levels of krypton-85 will derive almost entirely from fuel reprocessing; however, it will not be until the next decade that exposures will begin to be significant. By the year 2000, assuming total release of krypton, whole body exposure to the world population from krypton-85 is estimated to be about 0.04 mrem/person; skin exposure, 1.6 mrem. The tritium contribution from reactors, again assuming no removal, on the other hand, will be added to that produced naturally, plus that accumulated due to atmospheric weapon testing. Reactor-produced tritium will not become important on a worldwide basis until after 1990, and its contribution to dose will not approach that from krypton-85 until beyond the year 2000. Carbon-14 production, release, and dose contribution worldwide has not been well established for reactors, but will be small compared to natural sources, particularly since Carbon-14 will be precipitated as $Ca\ CO_3$ at the ocean bottom in a decade.

The technology has been established on the laboratory scale for adequate removal of these volatile radionuclides from reprocessing off-gas streams. For the most part, however, scale-up for optimization and demonstration is lacking.

Krypton removal can be accomplished by cryogenic distillation or by selective adsorption using fluorocarbons. Storage methods would either be by pressurized cylinders or through incorporating into zeolitic materials. These need further research. Plant installation of a krypton recovery system would cost about .05 mills/kw-hr.

Carbon-14 removal can be accomplished using standard carbon dioxide recovery methods — caustic scrubbing, cryogenic trapping, etc.; iodine-129, by standard oxidation or sorption techniques; and volatile ruthenium, by adsorption. Research is needed for all these to optimize removal and minimize residual waste volumes.

Off-gas treatment is probably unnecessary at current levels of reactor operations, as long as downwind exposure restrictions are met; the technology for treatment must continue to be developed, however, so that it will be ready when quantites of gaseous release from reprocessing may make removal of radioactive components desirable or necessary.

To have the technologies available in the early 1980's several million dollars a year must be directed to off-gas treatment development. It is estimated that removing all radioactive components from the off-gas stream could increase reprocessing costs by 25 percent (i.e., about .15 mills/kw-hr).

Waste Solidification

In the commercial fuel cycle, spent fuel is discharged from the commercial power reactor and shipped to the commercial reprocessing plant. At the reprocessing plant, the fuel is chemically dissolved and plutonium and uranium are removed for reuse and the radioactive products remain as a liquid high level waste. Under current Federal regulations, the liquid can be stored in the reprocessor's tanks for a maximum of five years before solidification. It must then be solidified and may be stored as a solid at the reprocessor's facility for a maximum of five more years prior to transfer to a Federal repository.

Under current plans and regulations, the liquid waste is to be evaporated to dryness and the waste converted to the oxide form, called calcine. This form, however, is somewhat dispersible due to its particulate nature, and it is fairly soluble in water. The next step in immobilizing the waste is to encase it in a solid, insoluble matrix.

Several forms and methods of glass encapsulation have been developed. The best overall has proven to be a borosilicate glass because it is highly receptive to incorporation of the waste species into the glass matrix, and it melts at a low enough temperature for ease of processing. Several methods have been demonstrated for mixing the waste and glass and melting them together in the steel containment can to form a single cylindrical mass For commercial wastes, these are expected to be about 12 inches in diameter and 10 feet long. The glass matrix is resistant to radiation damage and its resistance to water leaching is about the same as Pyrex glass. This technology is ready for utilization now.

More advanced technology under development would form the waste into borosilicate glass marbles which would be incorporated into a metal matrix — making it somewhat more rugged with better heat conduction.

Waste solidification will cost about twenty percent of the total waste handling and disposal costs. Capital costs for installation at a fuel reprocessing plant are estimated at several hundred million dollars with a time requirement of six or seven years for construction and licensing. Because of the lead time requirement, it is desirable to establish the method to be used together with appropriate criteria.

Uses of Transuranics

It has long been known that alpha emitters such as Pu^{238} are better power sources than any alternative fission products such as Sr^{90}. They are used for thermoelectric generators in space and as navigation aid power supplies at remote locations. There are many other scientific and defense uses. Thus in addition to making waste disposal safer, removal of transuranics from waste yields very useful products. These elements should be isolated from waste without regard to waste disposal issues.

Plutonium is as good an energy source in reactors as U^{235} and represents a valuable resource which should not be wasted in an energy poor world, irrespective of whether or not the LMFBR is adopted. Its use will extend available uranic supplies and remove it from long term environmental concern.

Regulatory action for recycle of reactor plutonium should be completed during 1977.

Possible Beneficial Uses of Fission Products

Many of the components of nuclear waste represent a potential and unique resource. Their recovery and use may be cost effective if other factors, such as the control of these potentially hazardous materials, can be assured.

Several of the fission products are of value as radiation or heat sources. Below are listed only a few of the potential uses:

Cesium-137 is a convenient gamma radiation source. Its half-life is 30 years, and it is produced abundantly in fission. This isotope can be conveniently substituted for cobalt-60 in medical radiotherapy applications.

A pilot-scale operation has shown cesium-137 irradiation combined with heat to be a cost effective treatment for disinfection of sewage sludge to make it useful as a plant nutrient and soil conditioner. Scale-up to widespread use of this technique could utilize most of the cesium-137 available in the near term. Many other potential applications involve use of cesium-137 as a gamma-irradiation source for food preservative — particularly for meat, perishable fruits, and to reduce pest infestation and consumption of grains during shipment and storage. It also may be used for the first step in "fixing" nitrogen for the production of fertilizer.

Strontium-90 emits only beta-radiation and has a 30 year half-life. These properties make it ideal for long-lived, highly-reliable thermal sources for heat or electrical energy in isolated places using either thermoelectric conversion or a Sterling cycle engine generator.

Quantities of the Platinum Family Metals (palladium, ruthenium, and rhodium) and technetium to be produced in reactors far exceeds the U.S. mineral reserves of these metals. They are used in catalytic processes and their current value is several hundred dollars an ounce. Rhodium and ruthenium must be stored for 20 to 25 years to allow their radioactivity to decay to usable levels. Their low level radioactivity may be beneficial to their catalytic properties.

These represent only a few of the possible uses of fission products from nuclear wastes. Their potential value can be sufficiently high to warrant their recovery from waste if other factors can be controlled.

Any of these applications, particularly those requiring greater amounts of activities will require vigorous controls and public acceptance.

Temporary Storage for High Level Solid Waste

Methods of temporary storage of solidified high level waste have been under study for some time. Originally, the object of these studies has been to provide the option of total retrievability of the waste for up to a hundred years while ultimate disposal methods were developed. Plans to develop a facility for retrievable surface storage were withdrawn shortly after ERDA replaced the AEC. Since a variety of fission products and actinides may become useful, this aspect of the problem should be reconsidered.

The steel cans containing high level waste will be approximately 12 inches in diameter and 10 feet long and will initially radiate about five kw of thermal energy from the decaying waste. The temporary storage facility must provide a means of dissipating the thermal energy, radiation shielding, maximum security, assurance of minimum leakage of radioactivity and provide methods of detecting, containing, and easy clean up should leakage occur.

Four basic types of facilities have been considered:

1) Water-cooled basin facilities in which multiple waste cans would be placed. The water would provide radiation shielding as well as cooling by forced circulation.

2) Forced air-cooled concrete vaults for emplacement of multiple cans of waste.

3) Sealed storage casks for individual waste cans. A three-foot concrete outer shield would be slotted at top and bottom with an annular air channel between the steel cask and the cylindrical concrete shield to provide convective cooling. Radiation dose rates at the outside of the unit would be less than 2 mrem/hour. This would

provide completely passive cooling.

4) Similar to three but with no airspace but rather thick steel containment.

The advantages to temporary storage are that the waste is retrievable, and a facility can be ready on a much more rapid time-scale and possibly at a lower cost than a permanent geologic facility. A disadvantage is that surface storage may not sufficiently allay public anxiety.

If it is decided that surface storage should be followed by more "permanent" storage, the cost of adding a temporary storage step to the waste disposal process would approximately double the total cost of geologic disposal alone.

Geologic Disposal

Deep formations which have shown geologic stability for hundreds of millions of years in certain regions are considered to be sufficiently stable for assuring waste isolation for another million years. Initially, the only geologic material under consideration for disposal sites was salt which has the desirable property of being dry and plastic. That is, it flows and any fractures which could allow eventual water intrusion to the waste would heal themselves and assure waste isolation. Therefore, more work has been done to develop salt mine disposal than for other geologic materials. A great deal of effort has been devoted to obtaining data on the effects of waste emplacement on the salt — particularly thermal and radiation effects — in order to establish design criteria for waste cannister spacing to assure the absence of long range effects in the salt.

A number of other stable geologic formations show promise for use for deep waste disposal — particularly deep, thick shales, sandstones, or granitic materials. These formations have advantages over salt in that they are not water soluble as is salt, and they are more widely available. ERDA has now initiated an expanded program to locate and develop multiple sites for deep geologic storage in bedded salt, salt domes, or other appropriate geologic materials. An important element in site selection will be to assure an absence of past and future intrusion by man in mineral or fossil fuel recovery.

The concept for disposal is basically to mine out the appropriate region of the formation, emplace the solid waste-containing cannisters over a period of time, and then backfill the mine and shaft. Some argue for buffer zones which may be maintained on the surface surrounding the site. Disposal costs

by this method are estimated to about 0.05 mills/kw-hour.

The current schedule for the geologic disposal program calls for operation of the first site by 1982. Funding level for terminal storage of commercial waste is $34 million in FY 77.

Seabed Disposal

Studies on burial of radioactive waste in the seafloor sediment or underlying rock have been proceeding for more than two years. It is believed that the ocean floor provides a continuous history of the environment for the past 10 million years and that if we can look back and see no evidence of change for the last 10 million years the chances are better that we can convince ourselves that there won't be any changes for the next half-million. Areas of interest include the north central Pacific and Atlantic. If the burial sites should be in international waters, agreements between nations would have to be worked out. The present program is developing into a multinational R&D and evaluation program.

Preliminary data indicates promise for the seabed concept. At present the focus is on the sediment, which covers the seabed rock up to several hundred feet,and the determination of the rate of radionuclide migration through this sediment. It has been found that the rate of water movement through the clay is slow. (In some places (the Atlantic coast of Spain) a layer of two meters gives information on 10 million years which means that at least some components move at exceedingly slow rates.)

It doesn't appear that a decision on the feasibility of this concept can be reached before 1985. The estimated cost to provide data in support of this decision is $15 to $20 million. The following efforts need to be performed to provide this data: (1) extensive geological/geophysical/oceanogrpahic/biological studies on the sea and seabed to nail down the locations and specific features of suitable areas; (2) studies of the composition and physical characteristics of the seafloor material and geologic stability; and (3) development of a canister material resistant to corrosion

during emplacement and able to withstand the hydrostatic pressures.

Two types of sea floor regions have been considered:

1) Stable Deep Sea Floor -- areas such as deep ocean basins and abyssal plains, which are considered geologically stable. The waste would be placed in the bedrock below the unconsolidated sedimentary cover, or on the top of the sediment from where it might be recovered.

2) The waste would be placed in trench areas to be carried down, or subducted, deep into the earth's mantle with the crustal plate. The subduction process is probably too slow.

Studies of this method might continue, although it does not appear that it can be ready for the initial phase of required waste disposal capability.

The fact that the material may be less easily controlled by U.S. authorities and that international objections might arise are arguments against the seabed disposal.

Space Disposal

This concept involves launching encapsulated waste into space, utilizing a version of the space shuttle system being developed by NASA. It requires escape from the solar system. Direct trajectory to the sun is the highest energy consuming trajectory. Costs appear to be very high primarily due to the required shielding, cooling, and high integrity packaging to assure safety. To expand assurance to a sufficiently acceptable degree would probably be difficult to achieve even at high cost.

It has been suggested that permanent disposal of selected very long-lived species, such as iodine-129, which could be separated from the waste, may be conveniently disposed of by this method since amounts would be relatively small.

Thorium Fuel Cycle and Waste Issues

The thorium cycle starts with substitution of Th^{232} for U^{238} in a uranium reactor. Neutron capture products from fissile U^{233}--which would be substituted for U^{235}--are, to a close approximation, the same as those from U^{235} for the same power generation, so fission wastes problems are identical. There are three notable differences:

First, separation of U^{233} from thorium and fission products is a chemical step which can be carried out to any desired degree. Thus there is use of high carryover of fission products.

Second, neutron capture does not produce plutonium or transplutonium elements until mass 237 (4 neutrons)is reached as opposed to one neutron on U^{238} to produce Pu. To a first approximation the amount produced is less by the fourth power of the fuel burnings. This implies about 10^{-4} as much of the transplutonium containments in the wastes.

While unirradiated U_{233}--fuel developes gamma activity which is stronger than in the case of U_{235}, there is no similar difference in the irradiated fuels. Therefore this point results in no change in regard to waste disposal.

PREAMBLE

Planned deployment of nuclear reactor plays a major role in the economic stability and self-reliance for energy in the United States. Recently these plans have come under increasing nationwide attack. A part of this attack is related to nuclear waste disposal and recycling of nuclear materials.

It is not generally realized that after valuable byproducts (including plutonium) have been extracted from the nuclear waste, the remainder returns in approximately 300 years to a level of activity and potential hazard lower than was the case with the crude uranium when it left the mine.

A further decrease to negligible levels of activity follows. Thus, in the long run the nuclear industry will rid the earth's crust of radio-activity rather than adding to it.

The valuable heavy elements extracted from the waste (particularly plutonium) have been claimed to endanger thousands of generations as yet unborn. In fact, these will be burned up or in other ways used in one or, at most, two generations.

In using the ashes from nuclear reactors, great care must be taken and therefore one should embark on action only after careful consideration. Approximately 150M$ has already been spent on this program thoughout the years, partly on temporary disposal, partly on research directed toward permanent disposal. In the process there has, according to the best information available, been no one member of the public who has been irradiated beyond the maximum permissible dose which, in fact, little more than doubles the background radiation to which all of us are and have been exposed.

In order to put to rest further worries about waste disposal, the following timetable is suggested:

DRAFT PRESIDENTIAL STATEMENT

For the Fiscal Year 1977, $120M will be appropriated to solve the fuel reprocessing and waste disposal problems. The spending of this money should result in the following accomplishments by the times specified. The more specific statements follow.

a) Firm and enduring standards will be established by NRC for temporary waste disposal and storage. These standards will not be changed without at least ten years prior notice, except in the case of national emergency.

b) Firm and enduring standards will be established by NRC for the burn up in available reactors of the bulk of transuranic elements, both separately or mixed with enriched uranium fuel by the end of Fiscal Year 1977 or as soon thereafter as possible but before the end of Fiscal Year 1980. These standards will not be changed without ten years prior announcement, except in the case of national emergency.

c) Completion of research by ERDA and certification by NRC of one or more processes for the separation of transuranics (plutonium, americium, curium, and Californium) from fission products and spent uranium fuel by the end of Fiscal Year 1977 or as soon thereafter as possible, but before the end of Fiscal Year 1978.

d) One or more national repositories for temporary waste and spent fuel storage will be made available by ERDA and certified by NRC and EPA by the end of Fiscal Year 1977 or as soon thereafter as possible, but before the end of Fiscal Year 1978.

e) One or more sites for the permanent disposal or storage of high-level fission product wastes will be selected by ERDA and certified for study by the end of Fiscal Year 1977 or as soon thereafter as possible, but before the end of Fiscal Year 1978.

f) Completion of research by ERDA and firm and enduring certification by NRC of a method or methods suitable for transformation of fission product waste to solid insoluble substances acceptable for either temporary or permanent disposal before the end of Fiscal Year 1979.

g) Completion of construction by ERDA and certification by the NRC and EPA of one or more facilities for permanent waste disposal before the end of Fiscal Year 1987.

h) Vigorous participation of the United States in the international negotiations concerning worldwide waste disposal problems in which an increasing number of nations are becoming interested.

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THE WHITE HOUSE

WASHINGTON

May 27, 1976

Dear Edward:

Thank you very much for your letter of April 27 and, even more importantly, for bringing the whole nuclear waste problem to my attention. The fact that we made an Administration statement is due in large part to your urging. I am enclosing a copy. We have not ruled out the possibility of a Presidential statement at some later time but we did conclude that, on balance, a statement from the Energy Resources Council would be a better approach now.

I have asked Glenn Schleede of my staff to follow up with ERDA, OMB and the other agencies concerned on all of the ideas in the papers.

With warm regards

Sincerely,

James M. Cannon
Assistant to the President
for Domestic Affairs

Dr. Edward Teller
Lawrence Livermore Laboratory
University of California
P.O. Box 808
Livermore, California 94550

Enclosure

Nuclear

THE WHITE HOUSE

WASHINGTON

Dictated from Denver

July 12, 1976

File

MEMORANDUM FOR: JIM CANNON

FROM: GLENN SCHLEEDE

SUBJECT: Petersen Draft Speech

This memo is to explain my concerns about the draft of a speech that Dr. Petersen had planned to give to the Denver Conference on Nuclear Waste Management. It includes both general problems and more specific problems.

General Problems

1. The conference is designed to focus on problems of nuclear waste management. Dr. Petersen's proposed speech is a broad summary of the criticisms of nuclear power. It discusses: (a) nuclear moratorium questions, (b) nuclear safety, (c) nuclear fuel reprocessing, (d) nuclear proliferation, (e) adequacy of safeguards against terrorists, and finally, (f) nuclear waste.

2. The emphasis in the speech is on critics' questions and on the negative side of issues raised. It does not include the balancing points that answer many of the critics in whole or in part.

3. The speech reflects the fact that CEQ staff is inadequately informed about the actions now underway to deal with the nuclear policy questions raised by Dr. Petersen. (This may, at least in part, be our fault.)

4. The draft speech, despite its far-ranging coverage, was not discussed in advance with the agencies having primary responsibility for the areas covered; e.g., NRC, ERDA, NSC, State Department, OMB, or Domestic Council.

More Specific Comments

1. Nuclear Moratorium Referenda. Page one discussed ~~uses~~ the California moratorium vote but suggests that the questions raised in that vote have not been adequately addressed. A moratorium issue is on the November ballot in Colorado. I believe this Speech is contrary to the Administration guidance against high Administration officials going into states and "taking" the flames, where moratoria questions are on the ballot. One sentence points out that laymen must base their decisions "on an act of faith beyond their personal grasp of the complex technological issues."

2. Nuclear Safety.

   - The speech downplays the significance of the Rasmussen nuclear safety study.

   - The speech indicates that assurance about nuclear safety is dependent upon actual safety tests in reactors, when in fact no such tests will occur in the manner suggested by the speech.

   - The speech then says that we need the answers from such tests now and thus leaves open the question of what should be done about reactors now operating and those coming on line.

   - All critics raising nuclear safety questions are lumped together as raising legitimate concerns.

3. Proliferation and Safeguards. This section begins with the inflammatory statement: "The threat of nuclear devastation is also behind the concerns that nuclear power's critics have about the reprocessing of spent fuel and the use and safe custody of plutonium--a major byproduct of the reprocessing operation."

   - The speech does not take credit for some of the non-proliferation steps already underway; e.g., the Non-Proliferation Treaty.

   - The description of the multi-national reprocessing plant concept is out of date with recent policy directions.

4. Reprocessing. The speech prejudges the question of whether to reprocess nuclear fuel by indicating that the solution is to delay reprocessing.

   - This conclusion is reached despite the fact that NRC is now engaged in an extensive evaluation of this issue--at the public behest of CEQ.

5. Waste Management. This section is not bad but includes one statement that is not consistent with the recent ERC release on behalf of the Administration of the status of nuclear waste management--a statement which was signed off on by CEQ.

6. Minor Problems. The reference to the relative priority of conservation R&D is not consistent with the President's budget on the agreement reached with ERDA when the R&D plan was recently cleared.

   - Technical inaccuracies with the statement on deaths from nuclear plants.

The above observations are based upon extensive discussions with Mark Rowden, chairman of NRC; ERDA staff; NSC staff, and my own observations. A copy of the draft speech is attached.

Attachment

Remarks by Russell W. Peterson
Chairman, Council on Environmental Quality

International Conference on the Management
of Waste from the L.W.R. Fual Cycle
Denver, Colorado
Monday, July 12, 1976

For release: 2:00 P.M., July 12, 1976

Contact: John R. Fogarty (202) 382-1235

NUCLEAR POWER ON TRIAL: AGENDA FOR A FAVORABLE VERDICT

A few weeks ago, the citizens of California rejected by a margin of two-to-one a proposal that could have severely restricted the further development of nuclear power in that state. By the usual American standards, two-to-one is a landslide -- and the figures standing by themselves would suggest a thumping vote of approval for nuclear power.

But I am not so sure this is what the result means. The verdict was clouded by the enactment in the California legislature of similar, but less restrictive measures 5 days before the referendum. Further, both sides had lined up impressive rosters of scientific talent to endorse their respective stands. Thus, it is likely that many well-intentioned laymen had to base their decisions on an act of faith beyond their personal grasp of the complex technical issues.

In short, the California vote should not be interpreted to mean that nuclear power is out of the woods. Two other states have initiatives scheduled for this fall. And the very fact that there are initiatives at all serves to emphasize one major point: the nuclear power debate is not entirely about technology, but about public confidence -- about the degree to which the public believes it can trust its experts.

Whatever the foundation of public concern about nuclear power, the crucial point is that these attitudes are real. And because, in the U.S., as in many other nuclear countries, public acceptance is critical to further development of nuclear power, the nuclear industry and the government have a responsibility to respond to -- rather than react to -- growing public skepticism. Without such responsiveness on the part of government and industry the future of nuclear power will be cloudy indeed.

What then are the critics of nuclear power concerned about, and how can their concerns be responsibly met? First, they

have very strong beliefs about energy priorities, and nuclear fission is not at the top of the list. They see a need to slow the growth in energy demand, to make a major commitment to energy conservation, and to vigorously pursue the development of clean energy technologies such as solar.

I cannot disagree with these priorities. Indeed, as a nation we are moving toward achieving them. Energy demand in the U.S. dropped by 5% between 1973 and 1975. And, even though it grew during the first half of 1976, there appears to be consensus that historic growth trends will not continue over the longer term. As for energy conservation, the Energy Policy and Conservation Act, signed into law by President Ford last December has set the nation on to a major conservation effort for automobiles -- requiring new car fleets to average 27.5 mpg by 1985 -- an approximate 75% increase in mileage over the 1975 fleet.

Furthermore, the Energy Research and Development Administration has now singled out energy conservation technologies for increased attention; its National Plan for Energy Research, Development, and Demonstration, released last April, assigns them highest priority for national action. Indeed, the President's 1977 Budget for energy conservation RD&D represents a 64% increase over FY 1976 levels. Similarly, research and development funds for solar energy were increased by 35%.

So there should be no question about our commitment to conserving energy and developing clean new sources. Unfortunately, however, our nation is -- as is much of the world -- still in the early stages of a transition from primary reliance on petroleum and natural gas to alternative energy sources. As we continue to run out of oil and gas we simply don't have any choice but to rely on some combination of coal and nuclear fission during the transition, even with a major commitment to energy conservation. Even at a low energy growth rate and with an optimistic view toward the introduction of solar technology, we cannot meet the energy needs -- along with the environmental goals -- of our people over the next generation without significant reliance on nuclear power. Our challenge is to take the steps we must to solve the problems that are associated with nuclear power, and which its critics so legitimately raise.

Those who are concerned about a nuclear future for the U.S. and the world focus on three major issues: the safety of nuclear reactors; the safe custody of nuclear materials throughout the fuel cycle; and the safe disposal of nuclear wastes.

Skepticism about the safety of nuclear reactors is at the root of concern over whether the power of the atom -- born in war as a weapon of unparalleled destruction -- is being safely harnessed for peaceful use. Supporters of nuclear power are quick to point out that there are now 170 reactors operating in the world and they have operated for a cumulative total of __ reactor years without a single fatality. That -- they say -- is a safety record deserving of praise not skepticism. Yet with additional nuclear reactors currently under construction or otherwise committed and with the prospect of in operation by the year 2000, the critics remain skeptical of the chances for maintaining the nuclear industry's safety record over time. Sophisticated mathematical risk analyses have ~~been small comfort. They want -- and I believe that they deserve -- real assurances in the form of actual testing of nuclear reactor safety systems.~~ In the U.S. the NRC is responsible for conducting tests to confirm the effectiveness of safety measures, such as emergency core cooling systems, designed to control the effects of loss of coolant accidents.

Other countries are involved in similar work. The results from these and other tests will provide important data, enlightening on both sides the debate over the safety of nuclear power. It will take years before these tests are completed, yet the results are needed now. Is it so surprising then that questions of reactor safety continue to be raised? We should prove the effectiveness of our nuclear safety systems as quickly as practicable.

The threat of nuclear devastation is also behind the concerns that nuclear power critics have about the reprocessing of spent fuel and the use and safe custody of plutonium -- a major byproduct of the reprocessing operation. Our sources of natural uranium are finite and becoming increasingly scarce and expensive; therefore the nuclear industry -- and many nations -- are looking to chemical reprocessing of spent nuclear fuel in order to recapture the fissionable uranium and plutonium that remain for use in fabricating fresh fuel. The problem with this is that the plutonium can be diverted from use as fuel for power reactors to the making of nuclear weapons. There currently exist no effective safeguards to prevent terrorists from stealing plutonium for nefarious purposes or, indeed, to prevent national governments from diverting plutonium and other weapons-grade materials into weapons manufacture. We are forced to keep our fingers crossed and to depend upon the self-restraint of those nations that already possess reprocessing technology or have the capability to develop it. That is a totally unsatisfactory situation. I believe that responsible governments and the world community must resolve this problem before we embrace spent fuel reprocessing as an energy source.

Along these lines, ~~it is the policy of~~ the U.S. Government, ~~as stated by Secretary Kissinger in 1976,~~ ~~to promote~~ the concept of multi-national, regional fuel reprocessing centers. This concept ~~does promise~~ to check the spread of plutonium and other weapons grade nuclear materials and technology to individual non-nuclear weapon states. ~~Regional reprocessing centers would have the following advantages: first, they would~~ replace the risky practice of certain countries making fuel reprocessing technology available as a part of nuclear reactor sales agreements; second, ~~they could~~ ameliorate safeguards problems by reducing the number of plants to the minimum needed; third, ~~they would~~ extend the benefits of reprocessing to countries where the number of operating reactors was insufficient to satisfy a reprocessing plant; and fourth, ~~they could~~ reduce potential environmental impacts by lessening overall transportation requirements and by facilitating implementation of international effluent control standards. But even so, the existence of such centers by themselves does not provide adequate protection against the threat of diversion of plutonium. The regional center concept ~~must be bolstered~~ with additional safeguards to prevent ~~such~~ action.

Existing IAEA safeguards, including materials accounting and inspection, are a valuable supplement to the regional center concept. The risk of early detection of a country's breach of peaceful use assurances and international reaction to such a discovery discourages countries from violating their assurances in the first place.

But existing international safeguards also have serious limitations. Detecting diversion and sounding alarms may not be enough if the violating country has already stockpiled plutonium. Weapons could be fashioned before any international response could be organized. This, apart from regional centers and existing safeguards, ~~additional measures are needed~~ to prevent the risk of diversion from established stockpiles.

I believe, for example, that supplier nations should maintain strict accounting of supplied fuels, including control over reprocessing as well as application of IAEA inspection and accounting systems to the entire fuel cycle. But, perhaps one of the simplest interim safeguards to employ while we are developing more permanent institutions is to hold off on reprocessing until the time when there is a more genuine need for it, a need that goes far beyond the short-range economic justification of the utility owners of spent fuel, one that includes a balancing of other factors such as the overall availability of uranium and alternative fuels. The risks of proliferation and diversion which arise from spent fuel reprocessing are so serious that they should be avoided until we are sure that they can be made acceptable.

The final problem that the back end of the fuel cycle poses is the management of nuclear wastes. The problems associated with safeguards against the misuse of nuclear materials must be solved if nuclear energy is to have a future. This is also true of radioactive waste management.

~~No human institution -- no nation, no religious or political creed, no agency of any kind other than the individual human family -- has survived for a period remotely approaching even 10,000 years.~~ Several hundred thousand years will be required for our transuranium contaminated wastes to decay to harmless levels. Considering the political instability of much of the globe today, and the comparative youth of human institutions generally, it appears to me that technological solutions to the problem of waste disposal must minimize dependence on our present governmental institutions. We must somehow place them beyond the ability of future humans to disturb -- either by accident or intention.

I believe that we can solve the waste-management problem if we devote enough resources and imagination to it. However, most of us who have such confidence are correctly chastised by those who are skeptical because we have been saying this for roughly 30 years, and we have yet to develop a satisfactory method for permanently disposing of our nuclear wastes.

The year has been an active one for those concerned with waste management in the U.S. The President's proposed budget for FY 1977 represents a five-fold increase over the previous years level for waste management. A Federal Interagency Task Force on Nuclear Wastes has been established to coordinate the programs of the several U.S. agencies with responsibilities in this area. Perhaps the most encouraging sign is our willingness to review past decisions and revise our programs when that is needed. Along these lines, ERDA withdrew its proposal for a temporary retrievable surface storage concept in favor of developing a permanent waste disposal alternative. ERDA has also recently published its Technical Alternatives Document to waste management which describes technically feasible alternatives for dealing with wastes. ERDA currently has underway a major search for appropriate sites for its geologic terminal storage concept and also is studying other methods such as deep sea-bed disposal of radioactive wastes.

The results of these studies — including the environmental impacts of various alternatives will be set forth in an environmental impact statement that should be of great value to decisionmakers within ERDA and other Federal agencies. Of course, ERDA has sponsored this technical conference on waste management, the results of which will also be integrated into the Federal Government's decisionmaking. And finally, ERDA,

the Nuclear Regulatory Commission, the Environmental Protection Agency, the National Science Foundation, and the Council on Environmental Quality are jointly sponsoring a conference in the fall to explore the social and institutional aspects of alternative waste management solutions. We believe that the information obtained from this meeting will provide important insights to agencies regarding public concerns and expectations in radioactive waste management.

Earlier I discussed the multi-national approach to reprocessing as one means of safeguarding nuclear material from theft or diversion. Yet waste management also provides opportunities for multi-national, regional action. Consider the varying geographical and geological circumstances of nations using nuclear technology. For example, both Japan and Iran are earthquake-prone; much of the Netherlands is below sea-level; and island nations, such as Britain, may not have the land -- let alone the stable geological formations -- for the safe, virtually perpetual storage of high-level wastes. If we are wise, we will begin to consider the likelihood that some nations may have to accept nuclear wastes from others.

We still do not adequately understand the transport phenomenon of radionuclides through our air, land and water. Yet we do have enough evidence to know that many nations may suffer from inadequate waste-disposal procedures carried out by any one nation. Thus, the management of nuclear wastes must become an international responsibility -- a shared obligation.

I believe therefore that it is time that the world's nuclear nations begin to study the concept of establishing multinational, regional waste centers in stable areas of the world especially well suited for waste storage or disposal. Such centers would serve as a practical alternative for nations faced with poor choices for disposal of their wastes.

The creation of such centers could also have an important side benefit by acting as an incentive to participate in multinational regional reprocessing arrangements if the international community decides they are needed.

The Council on Environmental Quality has sufficient confidence in human expertise to believe that the problems surrounding reactor safety, safeguards, and waste management can be resolved. It is clear, however, from the nuclear initiatives in this country and from protests in other nations that many of our fellow citizens do not share this confidence. Whether we regard their fears as well-founded or not is beside the point; in democratic countries, citizens can exercise a veto power over the actions of governments and industries -- and they are capable of holding up further

development of nuclear power if they are not satisfied with our response to their doubts.

Nuclear power is thus on trial ~~throughout the~~ world -- and it will remain so for some time to come. We must maintain the liveliest sense of caution about this awesome force we have released into our environment. Only if we demonstrate a continuing vigilance about nuclear hazards can we hope that the public jury will return a favorable verdict on our continuing exploration of nuclear benefits.

# # # #

4. Reprocessing –
– Prejudges the conclusions w/ respect to reprocessing (Puts Cult on record of delaying reprocessing while NRC is considering situation – at Ed's urging.)
[Bottom of 4]

– One sided by w/ Nuc P –
– Ph[illegible] Sen Amendment
– diversion – [illegible]

– Prejudges CEQ position on GESMO
Lack of objectivity

5. [illegible] – Not consistent w/ [illegible] (P. 5)

A. Process
B.
B Emphasis on Questions ^critics – Not balanced with ^and [illegible] side.
points that answer critics in whole or part.
C – Process [illegible] for detail [illegible]
D. – [illegible] as to actions [illegible] underway (cover [illegible])
E. [illegible] – [illegible]
1. Inflames [illegible] issues in a state where issue is on ballot in Nov.
– [illegible] "[illegible]" P1. – P.6.
2. Nuclear Safety
– downplays ^significance Rasmussen study
– indicates ^actual multiple test are needed now – when, in fact, such tests cannot be done –
leaves open the question of what do we do –
– In words used, ~~[illegible]~~ [illegible] all critics are given equal credence to all.

3. Proliferation & Safeguards
– Inflammatory language [illegible] p. 3.
– ~~[illegible]~~ ^[illegible] credit for steps underway (ERDA, NPT)
– [illegible] reprocessing plant concept.

Issues
– Consensus ERD
– Technical issues (Points [illegible] for Nuc Power)

NATIONAL CONFERENCE ON PUBLIC POLICY ISSUES IN NUCLEAR WASTE MANAGEMENT

- Background -

Origins

- In February of this year, representatives of CEQ, NSF, ERDA, EPA, and NRC met to discuss the prospect of conducting a workshop on the "nontechnical" aspects of the nuclear waste management issue. The workshop was intended to be a followup to the technical review of the waste management conference scheduled for July in Denver. Originally conceived as a one-day workshop for selected individuals representing State, local, and Federal entities, industry, environmental, consumer, and other groups, the workshop subsequently was extended into a three-day public meeting with anticipated attendance of between five and seven hundred.

Arrangements

- Arrangements for the workshop have been made by MITRE under contract to NSF who has been sponsoring a series of workshops under the broad headings of social, economic, environmental and institutional aspects of siting energy facilities. NSF was also chosen as the arranging agency because it would be seen by the involved groups as the most "objective" of the five Federal agencies due to its lack of direct program involvement in radioactive waste management.

- The workshop is jointly funded by the five Federal agencies.

Scheduling of the Workshop

- The date of October 27-29 was originally determined in April on the basis of hotel availability for large groups.

- The question of the October timeframe was also examined by the External Advisory Group (members in Appendix A) to the staff representatives of the five Federal agencies. At a meeting held on July 8, 1976, the Group considered an earlier timeframe on the grounds that workshop

discussions would provide more timely input to environmental impact statements. A later timeframe was discussed on the grounds of permitting a new administration greater involvement in the issue. The Group, however, recommended that the workshop be held in October.

Key Individuals (see Appendix B)

Structure of the Workshop (see Appendix C)

Guidelines

- The session chairman ~~here~~ have agreed that:
  - The workshop is not to be used as a forum for the discussion of whether the U.S. should or should not use nuclear power.
  - The workshop is meant to be an open forum for the exchange of ideas and not a platform for the espousal of personal political philosophies.

Agenda (see Appendix D)

Publicity

- NSF issued a Press Release on September 3 (Appendix E)

List of Participants on the External Planning & Guidance Group

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National Governors' Conference
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Staff Writer for Science Magazine
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Mr. Terry Lash
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Mr. Gary Ronald Bray
Science Applications, Inc.
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Mr. Alan McGowan
President
Scientists' Institute for Public Information
49 East 53rd Street
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Mr. David Swanson
Staff Member
Congressman John Anderson
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Mr. Gregory A. Thomas
Washington Representative
Sierra Club
324 C Street
Washington, D.C. 20003

Mr. Jon Veigel
Director of Research & Development
Energy Resources Conservation and Development Commission
1111 Howe Avenue
Sacremento, California 95825
(916) 322-3826

Mr. Mason Willrich
Professor of Law
University of Virginia School of Law
Charlottesville, Virginia 22903

*Mr. Laurence Moss
7531 Oak Glenn Court
Falls Church, Virginia 22042

*Mr. Moss will moderate the meeting

DRAFT

Appendix D

KEY FIGURES

GENERAL CHAIRMAN: **ALAN CAMPBELL (DEAN, MAXWELL SCHOOL, SYRACUSE U.)**

CHAIRMAN OF CEQ

ADMINISTRATOR OF ERDA

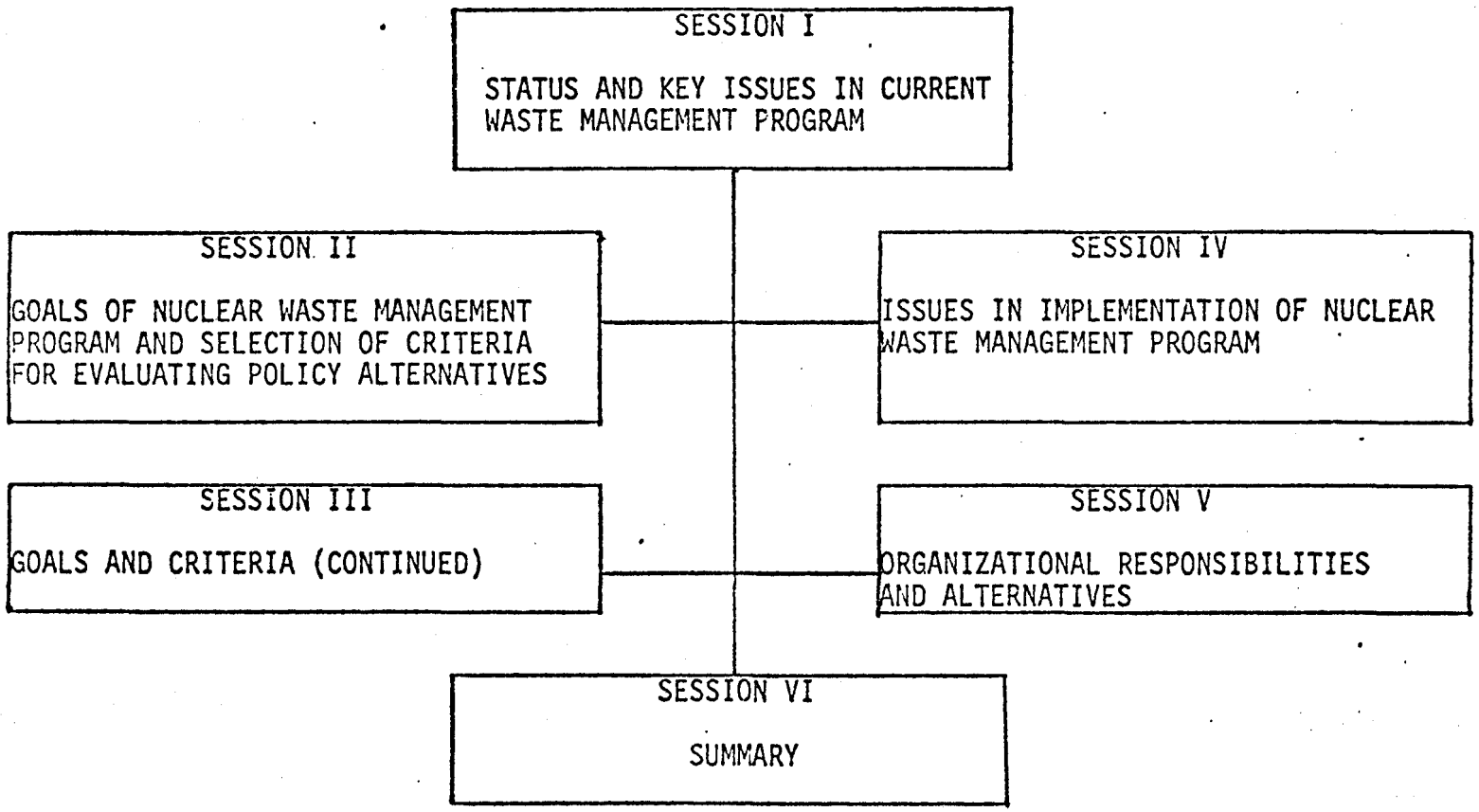
SESSION CHAIRMEN:	LARRY MOSS (ENERGY/ENVIRONMENTAL CONSULTANT) HAROLD P. GREENE (PROFESSOR OF LAW, GEORGE WASHINGTON U.) ED ROVENOR (LEGISLATIVE DIRECTOR, NATIONAL GOVERNORS CONFERENCE)
PAPER PRESENTATIONS BY:	MARK SHAREFKIN (RESOURCES FOR THE FUTURE) GENE ROCHLIN (INSTITUTE FOR GOVERNMENT STUDIES, U. OF CALIFORNIA, BERKELEY) BILL BISHOP (NRC TASK GROUP) DEAN ABRAHAMSON (SCHOOL OF PUBLIC AFFAIRS, U. OF MINNESOTA) EUGENE SKOLNIKOFF (DIRECTOR, CENTER OF INTERNATIONAL AFFAIRS, MIT) MASON WILLRICH (PROFESSOR OF LAW, U. OF VIRGINIA) WILLIAM DOUB (ESQUIRE) PAUL SLOVIK (OREGON RESEARCH INSTITUTE)
LUNCHTIME ADDRESSES:	REP. JOHN ANDERSON ASSEMBLYMAN CHARLES WARREN
PANEL MEMBERS:	BRANT CALKIN (PRESIDENT, SIERRA CLUB) GENE VARRANINI (CALIFORNIA ENERGY COMMISSION) IVARS GUTMANIS (NATIONAL PLANNING ASSOCIATION) IDA HOOS (INSTITUTE FOR GOVERNMENT STUDIES, U. OF CALIFORNIA, BERKELEY) DANIEL CALLAHAN (DIRECTOR, INSTITUTE OF SOCIETY, ETHICS AND LIFE SCIENCES) ROGER KASPERSON (PROFESSOR OF GOVERNMENT AND GEOGRAPHY, CLARK U.) ED HELMINSKI (NATIONAL GOVERNORS CONFERENCE) EDWARD HOWARD (VICE-PRESIDENT, BOSTON EDISON)

Appendix D

Appendix C

PLATE #1 "CONFERENCE ON PUBLIC POLICY ISSUES IN NUCLEAR WASTE MANAGEMENT"

CONFERENCE STRUCTURE



LUNCHTIME ADDRESSES:

REP. JOHN ANDERSON
ASSEMBLYMAN CHARLES WARREN

WORKSHOPS:

- INTERNATIONAL
- INDUSTRY
- UTILITIES

Appendix C

SESSION I

"Status and Key Issues in Current Waste Management Program"

- Dr. Alan K. Campbell, General Conference Chairman
  - Introductory Remarks
- Mr. John Busterud, Acting Chairman, CEQ
  - "The NEPA Process and Its Effect on Federal Agency Activities.
- Dr. Robert C. Seamans, Administrator, ERDA
  - Welcoming address and statement that the Federal Agencies are anxious to hear the concerns of the public both for the purpose of preparing the Generic Programmatic Environmental Impact Statement concerning the management of commercially-generated radioactive wastes and future ERDA program planning and implementation.
- Coffee-break
- Mr. Carl W. Kuhlman or Dr. John Bartlett (PNL)
  - Overview statement on ERDA waste management program.
- Mr. Lawrence Moss, energy/environmental consultant
- Mr. Harold P. Green, Professor of Law, George Washington University
- Mr. Edmond Rovenor, Legislative Director, National Governors Conference.
  - Session chairman will give preview of what is to be discussed in each of their sessions.
- Open Question and Answer Period
  - Questions to be directed to session chairmen concerning Conference's content. This will provide the opportunity for Conference attendees to have some part in planning of the topical sessions.

SESSIONS II AND III

"Goals of Nuclear Waste Management Program and Selection of Criteria for Evaluating Policy Alternatives"

- Moderator: Lawrence Moss

- Presentation of Papers

  Paul Slovik, Oregon Research Institute

  - Paper Topic: "Psychological Factors in Perception and Acceptability of Risk: Implications for Nuclear Waste Management"

  - Paper Abstract: The presentation will describe Mr. Slovik's general observations of the behavior of both individuals and groups under circumstances in which they are exposed to various degrees of risk. Mr. Slovik is a psychologist who has been a principal investigator on several such research projects. From his past research efforts he will try to draw conclusions about individual and group risk reaction. Preliminary outlines by Mr. Slovik would indicate that reaction levels depend upon the visibility of the risk to the affected people. Further, the author will review several of the leading waste management alternatives in the context of how some groups are likely to respond and whether they will over or under react to the potential risk of nuclear waste accidents. This information will result in an open discussion which will be able to feed into the ERDA decision making process, as it relates to placement and selection of nuclear waste storage facilities.

Mark Sharefkin, Resources for the Future

- Paper Topic: "A Systematic Approach to Establishing Criteria for Judging Nuclear Waste Management Alternatives"
- Paper Abstract: Mr. Sharefkin will begin by describing some of the more generally recognized technical alternatives of nuclear waste management and then explain his view on how the general lay society may themselves assess such alternatives. His approach is not meant to be an all inclusive statement of technical alternatives, rather, he will offer "Conference participants his logical matrix and explain how it might then be used as a generalized tool of assessment. His presentation will apply the criteria he has established to the technical alternatives mentioned at the beginning of his presentation. Confessedly, Mr. Sharefkin's views are neither the definitive word on the issues, nor his criteria the only ones of possible use. His discussion, however, will exemplify a process of assessment by the public and will likely promote a high magnitude of speaker-panel-audience interaction.*

Gene Rochlin, Institute for Government Studies, University of California, Berkeley

- Paper Topic: "Irreversibility and Multiplicity: Key Criteria in Nuclear Waste Management"
- Paper Abstract: This statement will present Mr. Rochlin's conceptualization of the nuclear waste management issue. The author will discuss two (2) concepts: (1) irreversibility; and, (2) multiplicity. "Irreversibility" refers to the policy decision that waste should be stored in a location where people of present and future generations are not likely to settle, since the form which nuclear waste will take is

an irreversible decision, after having once been made. The underlying premis of this concept, as with the concept of multiplicity is that should an accident occur, policy makers would have decreased potential morbidity and/or mortality of both human and ecological life. "Multiplicity" is a concept based upon a belief that insufficient knowledge currently exists upon which to base a final waste disposal system. Therefore, Rochlin will propose that numerous methods of storage, as well as large numbers of storage sites, be implemented. Again, the conclusion is based upon the perception of decreasing morbidity and mortality.

It should be recognized that the position of Mr. Rochlin is one which is not completely acceptable to either nuclear waste experts inside or outside the government. The selection of Mr. Rochlin, however, was on the basis of his representing the view of the uninformed or semi-informed layman. It is anticipated that this presentation will promote a dialogue which is directed towards "setting right" and placing in perspective such a conception or misconception.

Bill Bishop

- Paper Topic: "NRC Report (Bishop Report) on Goals and Objectives for Nuclear Waste Management
- Paper Abstract: Review of background and recommendations of NRC Task Force. This presentation will primarily be of informational benefit to Conference participants.

- Panelists

  Brant Calkin, President Sierra Club

  Gene Varranini, California Energy Commission

  Ivars Gutmanis, National Planning Association

  Edward Howard, Vice President, Boston Edison Company

  Ida Hoos, Institute for Government Studies, University of California, Berkeley

SESSION IV

"Issues in the Implementation of Nuclear Radioactive Waste Management Program"

- Moderator: Harold P. Green, Esq.

• Presentation of Papers

Dean E. Abrahamson, Professor, School of Public Affairs, University of Minnesota

- Paper Topic: "Social, Ethical, and Moral Issues in the Implementation of Radioactive Waste Management"

- Paper Abstract: Dr. Abrahamson will discuss in general terms four (4) topical areas in his presentation:

1. the consequence of exposing people to radiation risk both in sematic and ethical terms;
2. the moral and ethical issue of implementing a radioactive waste program, without first giving consideration to all reasonably available alternatives. This point will trace the historical progression of waste management to the present time. Although conclusory in some aspects, the speaker will not imply that current and future waste management program planning has been devoid of such considerations;
3. the burdens of today's nuclear waste management program on future generations, and
4. the fallibility of mortals.

This presentation has been chosen to present an overview of the "non-technical," if somewhat philosophical issues of the issue of nuclear waste management. As this issue has been raised by such creditable organizations as the United Nations, it was believed necessary to frame such issues for discussion at the October Conference.

Eugene B. Skolnikoff, Director, Center of International Affairs, Massachusetts Institute of Technology

- Paper Topic: "Interaction Between Scientific Experts and Lay Public in the Implementation of Nuclear Waste Management Goals"
- Paper Abstract: This presentation will discuss the communicative difficulties encountered between scientists and layman and will suggest ways in which this gap may be bridged. A secondary theme will be the fact that the general public is as a matter of practice reasonably disinterested in this issue until it affects them directly, eg. siting of a power plant in a heretofore "untouched" community. After presentation of the issue of the general public's possible resistance, Dr. Skolnikoff will address the question of how one incorporates the lay public in the decision making process at the earliest practicable time. As a footnote, one should recognize that ERDA has been funding a major attitudinal study at PNL on the issue of public perception.

- Panelists

Daniel Callahan, Director, Institute of Society, Ethics and Life Sciences, New York

Roger E. Kasperson, Professor of Government and Georgraphy, Clark University, Wooster, Massachusetts

David Rose, Professor, Massachusetts Institute of Technology

Barton Cowan, Esq., legal representative for nuclear industry in licensing cases.

Session V

"Organizational Responsibilities and Alternatives"

- Moderator: Edmond Rovenor

• Presentation of Papers

Mason Willrich, Director, International Program, Rockefeller Foundation

- Paper Topic: "An Overview of the Current Federal/State Nuclear Waste Management Scheme"

- Paper Abstract: Recitation of the institutional structures, e.g., ERDA, NRC, EPA, state public service commissions, etc. now responsible for research, licensing and monitoring of nuclear waste management. Mr. Willrich will further discuss the jurisdictional areas of each of the subject regulatory and research organizations. The paper will be only a portion of the study prepared for ERDA pursuant to a contract with the MIT Energy Lab. and which has been presented to Dr. Seamans for review and content.

William Doub, Esq.

- Paper Topic: "Problems of the Organizational Structure in the Federal/State System"

- Paper Abstract: This paper will describe the Federal/State interface in the area of high and low level waste management. The discussion will revolve around the issue of how the two (2) systems can be accommodated, further, he will review the current state arguments and delineate what responsibilities for low-level waste management have been delegated by the Federal government. As examples of state management of low-level waste --

Kentucky, Illinois, South Carolina, and Washington. Other topics to be discussed will include the problems of perpetual storage, the interaction between user and producer, and how low-level waste programs will affect state public service commissions.

- Panelists

Edward Helminski, Director of Energy Programs, National Governors Conference

Workshops

Industrial and Utilities concerns will be voiced in one or two evening meetings.

Possible participants who have voiced an interest in this concept are:

Frank Cotter	(Westinghouse)
John Yasinsky	(Westinghouse)
Wally Behenke	(Commonwealth - Edison)
Ralph Denster	(Nuclear Fuel Services)
Ray Baxter	(Nuclear Power Plant, South Carolina)
Paul MacMurry	(Exon)
Walton Rogers	(Nuclear Safety Associates)
Bill Gould	(Nuclear Policy Committee of EEI)
Howard Larson	(Atomic Industrial Forum)
Ed Howard	(V.P., Boston Edison)

SESSION VI

"Summary of Conference"

- Moderator: Allan K. Campbell, General Chairman

- Presentation of Session Proceedings and Issues for Future Policy Consideration
  - Lawrence Moss, Energy/Environmental Consultant
    Harold P. Green, Esq.
    Edmond Rovenor, Legislative Director, National Governors Conference

- Open Question and Answer Period
  - Allan K. Campbell, General Chairman

- Adjournment
  - Allan K. Campbell, General Chairman

Appendix E

Nathan Kassack
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FOR RELEASE:
Immediate
Mail: September 3, 1976
NSF PR76-73

NATIONAL CONFERENCE ON PUBLIC POLICY ISSUES IN NUCLEAR WASTE MANAGEMENT TO BE HELD IN CHICAGO, OCT. 27-29, 1976

A national conference will be held in October to develop information on public policy issues for consideration in Federal decision-making on nuclear waste management. Sponsored by five Federal agencies and open to the public, the conference is set for October 27-29 at the O'Hare Inn, Chicago (Des Plaines).

The conference is intended to provide a forum for identifying public policy issues in establishing a national nuclear waste management program, to improve public understanding of the implications of technical alternatives, and to help Federal agencies fulfill the requirements of the National Environmental Policy Act (NEPA), particularly in preparation of Environmental Impact Statements.

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Sponsors of the conference are Energy Research and Development Administration, the Nuclear Regulatory Commission, the Environmental Protection Agency, and the Council on Environmental Quality, all of which have responsibilities in developing a national nuclear waste management program; and the National Science Foundation, which is concerned with U.S. policy issues involving science and technology.

Representatives of local, state and Federal government agencies, industry, environmental and consumer organizations, and independent citizens are expected to participate in the conference.

Featured speakers will include Dr. Russell W. Peterson, Chairman, Council on Environmental Quality; Rep. John B. Anderson (R., Ill.), ranking House Minority Member, Joint Committee on Atomic Energy; and Assemblyman Charles Warren, Committee on Resources, Land Use and Energy, California State Legislature.

Moderators include Laurence Moss, energy/environment consultant and former president of the Sierra Club; Harold P. Green, Professor of Law, The George Washington University National Law Center, Washington, D. C. and Edmond Rovner, Legislative Director, National Governors' Conference and former director of its energy program.

Registration forms may be obtained from "Nuclear Waste Management Conference Registration," P. O. Box 570, Ben Franklin Station, Washington, D. C. 20044.

-END-

REQUEST

THE WHITE HOUSE

WASHINGTON

September 17, 1976

MEMORANDUM FOR: JIM CANNON

FROM: GLENN SCHLEEDE

SUBJECT: THE CHICAGO NUCLEAR WASTE MANAGEMENT CONFERNECE - OCTOBER 27-29

Attached, as requested, is a background paper describing this controversial conference. A major problem with it is its occurrence less than a week before nuclear moratoria issues appear on ballots in six states: Washington, Oregon, Colorado, Montana, Arizona, and Ohio.

Five agencies are involved: CEQ, EPA, ERDA, NRC and NSF.

Not reflected in the attached paper is the following information which I have received by phone:

-- The idea apparently started with CEQ and blossomed on an interagency basis -- at a relatively low level in the agencies. No one at the Presidential appointee level in the agencies I deal with is willing to admit approving it.

-- The conference was conceived of as a way, principally, of giving critics of the Government's waste management plans a forum for bringing their views to the attention of the Government.

-- An outside advisory group created by the agency staff people involved focused specifically on the question of timing and concluded that:

  ° A conference after the first of the year might have greater impact on a new Administration if there is one.

  ° A conference early in the fall probably would not have much impact.

  ° A conference in the last part of October would have the greatest impact on everyone.

I have collected information on the conference, but have refused requests from ERDA and NSF for guidance on what they should do. Top people at NSF and ERDA are embarrassed by the commitment to the conference in the last week of October.

At this point, there are three alternatives:

-- Postpone the conference.

-- Proceed with the conference as scheduled. My guess is that ERDA and NSF will, if asked, favor this approach on grounds that postponing the conference would result in criticism of the Administration.

-- Top people in agencies concerned could discuss openly with the advisory group and participants the possibility that the conference might constitute Federal Government interference in State ballot issues and then decide to postpone the conference.

I have not discussed this with anyone from CEQ, EPA or NRC.

Apart from dealing with the substantive problem, I think it would be fun to have the heads of the five agencies involved come in and explain to you how they let this occur.

Attachment

energy

THE WHITE HOUSE

WASHINGTON

1976 OCT 12 PM 12 31

October 12, 1976

MEMORANDUM FOR: JIM CANNON

FROM: GLENN SCHLEEDE

SUBJECT: OCTOBER 27-29 NUCLEAR WASTE MANAGEMENT CONFERNECE

Did you conclude that proceeding with this was either okay or inevitable?

Attachment

Glenn

We were too late to stop it. Jim

Schleede

Preliminary Program for Conference on Public Policy Issues in Nuclear Waste Management

Wednesday
October 27

Session I: Status and Key Issues in Current Waste Management Program

9:00 AM Introduction: General Chairman

9:15 AM Opening Remarks: Chairman, Council on Environmental Quality

9:30 AM Remarks: Energy Research and Development Administration

9:45 AM Presentation of papers

11:00 AM Discussion—panel and audience

12 Noon Luncheon. Speaker: Rep. John B. Anderson of Illinois; ranking House Minority Member, Joint Committee on Atomic Energy

Session II: Goals of Nuclear Waste Management Program and Selection of Criteria for Evaluating Policy Alternatives

1:45 PM Opening Remarks: Laurence Moss, energy/environment consultant; former president, the Sierra Club

2:00 PM Presentation of papers
Mark Sharefkin, Resources for the Future;
Gene Rochlin, University of California (Berkeley)

3:00 PM Panel remarks

3:45 PM Discussion—panel and audience

5:00 PM Reception (cash bar)

8:00 PM Workshops

Thursday
October 28

Session III: Goals and Criteria (Continued)

9:00 AM Presentation of papers

10:00 AM Panel remarks

10:45 AM Discussion—panel and audience

12 Noon Luncheon. Speaker: Assemblyman Charles Warren, Committee on Resources, Land Use and Energy, California State Legislature

Session IV: Issues in Implementation of Nuclear Waste Management Program

1:45 PM Opening Remarks: Harold P. Green, Professor of Law, The George Washington University National Law Center, Washington, D.C.

2:00 PM Presentation of papers
Dean E. Abrahamson, School of Public Affairs, University of Minnesota;
Eugene B. Skolnikoff, Director, Center of International Affairs, MIT

3:00 PM Panel remarks

3:45 PM Discussion—panel and audience

5:00 PM Social hour (cash bar)

Friday
October 29

Session V: Organizational Responsibilities and Alternatives

9:00 AM Opening Remarks: Edmond Rovner, Legislative Director, The National Governors' Conference

9:15 AM Presentation of papers
Mason Willrich, Professor of Law, University of Virginia Law School;
William Doub, Esquire

10:15 AM Panel remarks

11:00 AM Discussion—panel and audience

Session VI: Summary of Conference

1:00 PM Panel discussion

3:00 PM Adjournment

PUBLIC POLICY ISSUES IN NUCLEAR WASTE MANAGEMENT

P.O. Box 570, Washington, DC 20044

Conference
October 27-29, 1976
Chicago

Mr. James Cannon
Executive Director
Domestic Council
1600 Pennsylvania Avenue, N.W.
Washington, D. C. 20500

Chicago

Conference on Public Policy Issues in Nuclear Waste Management

October 27-29, 1976

Sponsors

Energy Research and Development Administration
Nuclear Regulatory Commission
National Science Foundation
Council on Environmental Quality
Environmental Protection Agency

Participation

Open to the public and representatives of local, State and Federal government; industry; environmental and other organizations interested in the nontechnical aspects of a national nuclear waste management program.

Place

Ramada/The O'Hare Inn
Chicago (Des Plaines), Illinois

Date

October 27-29, 1976

Purpose

The conference will provide an open forum in which to identify and to discuss the legal, institutional, social, environmental, and other public policy issues relating to nuclear waste management.

It is intended to encourage public input in establishing a national nuclear waste management program, to improve public understanding of the implications of technical alternatives, and to help Federal agencies fulfill the requirements of the National Environmental Policy Act (NEPA), particularly in preparation of Environmental Impact Statements.

Approach

A series of panel and workshop sessions will offer opportunities to gather views and information from—and to facilitate interaction among—invited speakers, panelists and audience participants.

During the plenary sessions, a limited number of papers will be presented as background for remarks by panelists and for discussions involving the audience. The final session will seek to summarize principal considerations resulting from the previous sessions. Following the conference, proceedings will be published.

Registration

Admission to the conference sessions is free. Because of space limitations, advance registration is urged. Individuals wishing to attend should use the registration form below. The registration fee of $35 entitles one to attend the two luncheons and to receive a copy of the proceedings when they are published. No split fee or partial payment can be accepted.

The deadline for advance registration is October 12, 1976.

Accommodations

Hotel accommodation may be arranged at the conference site by contacting Reservations Manager, O'Hare Inn (Ramada), 6600 North Mannheim Road, Des Plaines, Illinois 60018. (Hotel located five minutes north of O'Hare Airport, which serves Chicago. Complimentary limosine service from airport to hotel every 15 minutes. Phone 312/827-5131.) Please note that the block of rooms being held for the priority use of conference registrants will be released by the hotel on October 12, 1976.

Information

Contact for program content and technical liaison is Robert Bernardi, Energy Planning & Analysis, The MITRE Corporation, 1820 Dolley Madison Blvd., McLean, Va. 22101, phone (703) 790-6296. Contact for conference arrangements is Jeffrey Conley, Registrations Manager, Nuclear Waste Management Conference, P.O. Box 570, Washington, D.C. 20044, phone (202) 638-1200.

Clip and Mail

Hotel

Mail to Ramada/The O'Hare Inn, 6600 No. Mannheim Road, Des Plaines, IL 60018

Hotel accommodation is requested for the Conference on **Public Policy Issues in Nuclear Waste Management.**

Please reserve ☐ single ☐ double room for nights of

October _____, _____, _____, _____.

Name _____

Affiliation _____

Address _____

_____ Zip _____

Rates: $28.30 single; $34.60 double (prices include tax). For arrivals after 6 p.m., enclose first night's rate to ensure available space.

Note: block of rooms reserved will be released Oct. 12, 1976; registration should reach hotel before then. Make any check payable to Ramada/The O'Hare Inn.

Clip and Mail

Registration

Mail to **Nuclear Waste Management Conference,** P.O. Box 570, Washington, DC 20044

Register me for the Conference on **Public Policy Issues in Nuclear Waste Management,** Chicago, October 27-29, 1976.

☐ $35 enclosed; I wish to attend the two luncheons and to receive a copy of the printed proceedings.
☐ No money enclosed; I do NOT wish to attend luncheons or to receive copy of proceedings.

No split fee or partial payment will be received.

Name _____

Affiliation _____

Address _____

_____ Zip _____

Make check payable to: **Nuclear Waste Management Conference**

Deadline for advance registration: October 12, 1976