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FEB 8 1979

MEMORANDUM FOR: Robert G. Ryan, Director
Office of State Programs

FROM: William J. Dircks, Director
Office of Nuclear Material Safety and Safeguards

SUBJECT: STATE OF KANSAS REQUEST FOR ASSISTANCE IN LICENSING REVIEW FOR A LOW-LEVEL RADIOACTIVE WASTE REPOSITORY

This memorandum is in reponse to Wayne Kerr's September 13 memorandum to us requesting clarification of questions concerning the application for use of the Lyons, Kansas salt mine for a waste facility. You requested information on a "repository." The applicant asked for a license for "retrievable storage." In our responses to your questions we have addressed both an application for final disposal and temporary retrievable storage of low-level wastes.

It is our opinion that the environmental effects from a low-level disposal facility and those from a low-level storage facility at the Lyons mine will be nearly the same. It is also our understanding that the applicant's retrievable storage facility was a "de facto" disposal site. The costs of retrieving the wastes and maintaining the wastes in a retrievable condition was not addressed by the applicant but are probably prohibitively high. In view of these factors, we feel that consideration of the Lyons site should be limited to a permanent disposal facility.

We are prepared to meet with and discuss with Kansas officials the extent of NRC participation in their review. As a minimum, we would like to comment again on the application when a response is received from the applicant on the first set of questions. However, because of the high public interest in the waste disposal issue, and to assure that environmental impacts of the licensing action are reviewed objectively, independently and with full public exposure, we urge NRC preparation of a documented environmental assessment, as is now being done on a trial basis for uranium mills. We request that your office arrange a meeting with State officials to discuss NRC assistance in the review.

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NRC FORM 318 (9-76) NRCM 0240 ☆ U.S. GOVERNMENT PRINTING OFFICE: 1976 — 626-524

Robert G. Ryan

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Enclosed are answers to your specific questions to us, comments on the questions that Kansas sent to the applicant, and suggestions concerning other areas we feel that information is needed.

(signed) William J. Dircks

William J. Dircks, Director
Office of Nuclear Material Safety
and Safeguards

Enclosures:
1. Responses to Questions fr SP
2. NRC Comments on Kansas' Questions
3. Additional Suggestions

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*See previous yellow for concurrences

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ENCLOSURE 1

RESPONSES TO QUESTIONS FROM STATE PROGRAMS

Question 1: Please clarify the total quantity of special nuclear material allowed under an Agreement State License versus the individual quantities of the nuclides.

Answer: Agreement States do not license possession of special nuclear material (SNM) in quantities greater than 350 gm of ^{235}U, 200 gm of ^{233}U, or 200 gm of Pu. In case of mixtures of the above isotopes, the maximum amount is determined by the following formula (from 10 CFR 150):

$$\frac{\text{gm Pu}}{200} + \frac{\text{gm } ^{233}U}{200} + \frac{\text{gm } ^{235}U}{350} \leq 1.$$

The NRC must license possession of SNM in quantities greater than the above limit. If the facility is a disposal facility, the above limit would apply to the wastes stored above ground. Facility utilization plans and procedures for sealing tunnels may also have to be considered in determining when SNM is finally disposed of and no longer in the licensee's possession. If the facility is a retrievable storage facility, all material in storage (above and below ground) is considered to be in the licensee's possession. In the Lyons Mine, the above limit could be reached before the mine was 0.1% filled and therefore, an NRC license to possess SNM would be required. Also, we expect that the physical protection requirements of 10 CFR Part 73 would apply to the storage mode since, based on experience at other sites, cummulative totals of SNM would exceed the 5 kilogram limit.

Question 2: Please indicate the current status and mechanisms for the possibility of limiting the acceptance of waste at a site to solid materials only and whether this is an acceptable and feasible limitation or requirement.

Answer: No current NRC regulation requires a solid waste form. By administrative practice, NRC and the States limit burial of liquids at shallow land disposal facilities. The acceptability of certain waste

containing liquids, such as scintillation vials, is determined on a case-by-case basis. We consider it feasible for Kansas to require in the license that the waste be in a solid form, since limiting wastes to solids for storage and possible relocation is reasonable precaution. Special considerations may be applied to certain wastes, since excluding liquids in scintillation vials would impose a hardship on non-fuel cycle waste generators. All such decisions require a balancing of effects. For example, the hazards of breaking vials accidentally during storage or disposal operations must be compared to the hazards imposed by emptying the vials at the waste source point. The applicant should be required to evaluate these pros and cons. Gases, both those produced by decomposition of waste and stored gaseous wastes, would constitute a greater hazard in the confined spaces of a mine than at a shallow-land burial site and will require special design features in the facility. We consider that the foregoing apply to the case of either storage or disposal.

Question 3: Please indicate the current NRC policy regarding States performing environmental and economic feasibility studies of proposals such as this one by Southwest Nuclear Company.

Answer: Since the environmental impacts of storage are comparable to disposal, and impacts on other sites are the same, both a comprehensive environmental study and an economic feasibility study should be done whether the intent is storage or disposal.

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Environmental and economic feasibility studies should include a benefit-cost analysis and an evaluation of the need for the site and its potential impact on the currently operating disposal sites. The applicant should provide a benefit-cost analysis of the proposed site. Current NRC policy requires a review of the economic impact of new disposal sites on existing sites. This review is done to avoid closing of already committed sites, which would result in a proliferation of sites with no increase in capacity. All new waste sites must be justified on the basis of need. Need is determined on a case-by-case basis; and may be influenced by regional needs, equipment limitations, costs, transportation, and other factors. In view of the fact that only three disposal sites are now receiving wastes and that the three are not regionally distributed, demonstration of need for a disposal facility should be feasible.

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ENCLOSURE 2

NRC COMMENTS ON KANSAS' QUESTIONS TO SOUTHWEST NUCLEAR AS EXPRESSED IN KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT (DHE) LETTER TO SOUTHWEST NUCLEAR DATED AUGUST 17, 1978

The questions submitted by the Kansas DHE were quite comprehensive. We suggest that additional information is also needed.

#5) Who conducts the training course? How long is it, when are refreshers given, how much is practical, and what are the testing procedures used in the training program?

#6) Have the applicant demonstrate that they are aware of all applicable regulations, rules, and specific conditions by having them list their sources and citations. Quality assurance (QA) on packages and contents is needed. Test results, records, QA information provided by generators and shippers, identification of who reviews the records, how the records will be kept, how often records will be reviewed, and details of independent checks on radiation levels, package conditions, and repackaging are needed.

#7) For information on corrosive actions see ORNL 4555 and WASH 1503 (Summary of and EIS for Project Salt Vault). Maintaining container integrity is needed to retrieve the waste for ultimate disposal. The effects of internal corrosion (e.g., from waste solidified with urea formaldehyde) should also be considered. This may lead to a restriction on solidification agents and chemicals.

#8) What provisions will be made for repackaging damaged packages, and what will be the procedure for handling contaminated packages?

#11) Have the applicant describe the hoist system, head frame, and supports. Also describe the size limitations that will be put on packages as a result.

#13) How will shaft exposures (men and waste on different lifts pass) be dealt with?

#19) Is ventilation system failure considered an emergency? Also:

a. Have the applicant include action levels for determining that an emergency exists.

b. Have an analysis (conservative) done to estimate effects for all the above accidents.

#26) Also request the locations of monitoring instruments.

#26-28) Also have the applicant include action levels and procedures for action when and if these limits are exceeded.

#30) Also request all monitoring and filtration points and indicate where storage will take place.

#42) What is the basis for the $500,000 annual payment? What are Kansas' estimates of the costs for decommissioning, perpetual care, or waste retrieval? How will the fund be allocated, and who will hold the funds for eventual disbursement? (This affects how much is needed.) The applicant should be required to provide a decommissioning plan for the facility and on estimate of the cost to execute the plan. The annual payment should designed to provide the needed funds.

ENCLOSURE 3

ADDITIONAL SUGGESTIONS ON THE SOUTHWEST NUCLEAR APPLICATION

- Shielding provisions should be detailed on plans submitted. All handling equipment should be specified to include weight and size limitations and radiation protection provisions. Handling procedures under both normal and abnormal conditions should be specified.

- Materials not to be disposed of at Lyons should be specifically identified- (Application Part II.c.2.p). Procedures to make sure they are not received should be documented.

- What procedures and/or barriers will limit personnel access to tunnels and areas containing wastes?

- Decontamination equipment and procedures should be specified in detail for accident and retrieval operations. (Include equipment for processing and solidifying decontamination solutions.)

- An assessment of expected operator exposure levels should be made using the handling equipment provided.

- Potential release pathways should be identified and evaluated with respect to releases to the public. (During and after operation.)

- Site decommissioning should be addressed to include procedures, costs, and dose impacts.

- Site seismicity should be addressed in the application.

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- Reference to applicable mine safety regulations and permits needed for mines and effluents shall be made and assurances received thay they will be followed.

- The State should be informed as soon as an emergency situation exists--not after it has been corrected. (Application II.D.5.a).

- What are the procedures for use of protective garments (i.e., when are they used, where are they put on , taken off, cleaned, monitored, stored, and what are the supplies needed)? (Application II.D.6.b.6).

- Duplicate copies of all records should be kept off site. Kansas should receive periodic reports.

- The resource value of the salt should be addressed. Also the possibility of intrusion by solution mining of salt elsewhere, and oil and gas exploration should be assessed.

- (Application C.2.a and b) These SNM limits are not consistent with Part 150 (see 10 CFR 150.11). These limits also ignore all accumulated underground material, which is inconsistent with an application for a storage facility.

- Projections of the expected volumes, activities, and nuclides are needed for analysis of potential releases.

- A definite time limit on above-ground storage is needed. This limit should be related to protected storage capacity and must be explicit. A "should be less than 30 day" limit is unacceptable.

- (Application D.6.b) Who does the checklist and where is the log for inspection? What is the "moved material" they speak of (6.b.2)?

- Recordkeeping in a storage facility must be much more complete than at a disposal facility because of the eventual relocation of the waste. One needs records of locations, decay rates, radiation levels, etc. Planning of operations (moves, shielding, traffic patterns) on the basis of these records must be addressed.

- A civil engineer and a mining expert are needed as consultants and resource people.

- Emergency planning with local officials must be done. (i.e., fire, mine rescue, etc.)

- What are the procedures for dealing with leaking or corroded packages below ground?

- What will the costs be, and how will the waste eventually be removed if the facility is to be for retrievable storage?