

UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D. C. 20555 GL-80-9

January 29, 1980

Docket 50-021

ALL POWER REACTOR LICENSEES

Subject: Low Level Radioactive Waste Disposal

Recent developments at commerical low level waste burial sites have substantially impacted waste disposal operations. The license to operate the facility at Barnwell has been recently revised by the State of South Carolina to further limit the volume of waste buried and to upgrade the integrity of the waste form received at the site. Similar requirements to upgrade the integrity of waste forms packaged for the Richland, Washington burial site also have been required by the State of Washington. NRC licensees are required by Commission regulations to assure that wastes prepared for shipment are in a form that the Agreement State licensee is permitted to receive under applicable Agreement State regulations as well as meeting all pertinent NRC and DOT transportation regulations.

The past closure of low-level radioactive waste burial sites in Washington and Nevada and the strict enforcement of license conditions at Barnwell have resulted from the States' dissatisfaction with the events that have occurred involving solid radwastes shipped from waste generators including power reactors. Consequently, improvements will have to be made to comply with the State licenses.

NRC OIE Bulletin No. 79-19, Packaging of Low Level Radioactive Waste for Transport and Burial, has already been sent to you regarding this matter. You should review your system and operating procedures to assure the strict adherence to the revised burial site license conditions and their interpretation by the State authorities.

The enclosed license and accompanying letter from the State of Carolina to the site licensee, Chem-Nuclear Systems, Inc., describes the restrictions to be adhered to for the wastes received at that site. The requirements by the State of Washington on waste form upgrade is similar. The following areas are of particular concern to the States and should be acted upon accordingly.

1) Free Liquids in Wastes Leaving Reactor Site

The objective for solid radioactive wastes leaving the reactor site for burial is that they should contain no detectable free liquids as defined by Appendix 2 of ANSI/ANS 55.1-1979. In no case however, should the amount of free liquid upon arrival at the burial site exceed the burial site license conditions. Free liquid determination should consider the effects of transportation, e.g., vibration, freezing and thawing. This requirement is applicable to both dewatered resins and spent filter media as well as solidified wastes departing the reactor site

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The following conditions (items 2 - 4) must be met for the waste to be acceptable by burial sites in the States of Washington and South Carolina.

2) Free Liquids in Wastes on Arrival at the Burial Site

Until December 31, 1980, provide assurance that all wastes do not contain more than 1% liquid by volume upon arrival at the burial site. Any liquids present in waste packages shall be non-corrosive with respect to the container. Non-corrosive means conformance with 10 CFR 71.31, 49 CFR 173 and other DOT regulations such that there should be no significant chemical, galvanic or other reaction with the packaging components.

Tests should be conducted either on simulated or actual waste which demonstrate that wastes to be shipped conform to the above criteria. In addition, operating procedures shall be developed that implement the methods to be used to assure that all wastes arriving at the burial site comply with burial site free liquid licensing conditions.

3) Future Free Liquids Requirements

Effective January 1, 1981, no wastes packages shall contain more than trace quantities of non-corrosive free liquids upon arrival at the burial sites. Trace quantities is defined as no more than 0.5% of, or one gallon in, the container volume, whichever is less. For those waste currently solidified by UF systems, you should prepare to meet this requirement as soon as feasible before January 1, 1981. Present methods of waste solidification by UF systems do not provide assurance that the waste packages on arrival at the burial site contain no more than trace quantities of non-corrosive free liquids.

4) <u>Requirements on Spent Resins and Filter Media</u>

Effective July 1981, spent resins and filter media with radioactivity levels above 1 μ Ci/cc of isotopes must be stabilized by solidification. However, in lieu of solidification, other methods such as packaging dewatered resins in a high integrity container (e.g., reinforced concrete) may be proposed to the NRC and the States licensing the burial sites. Although the South Carolina letter accompanying the license amendment does not discriminate between long and short half-live isotopes, it is our understanding through discussions with the State officials, that only isotopes with half-lives greater than 5 years need to be included in the Consequently, solidification or high integrity containers would then only be required if radioactivity levels exceeded 1 μ Ci/cc for radioisotopes with half-lives greater than 5 years.

In addition, the revised South Carolina License for Chem-Nuclear Systems, reduces the volume of waste allowed to be buried at Barnwell. This, and possible future burial site problems may result in a shortage of low level waste disposal capacity. Consequently, licensees should take positive steps to minimize the volume of waste produced. To this end, each licensee should implement a program to minimize the generation of radioactive solid wastes (e.g., waste segregation) and implement methods to reduce the volumes of waste which cannot be eliminated (e.g., use of trash compactors).

The revised requirements on waste forms may necessitate the use of mobile or temporary solidification systems. Regulations require that any changes to your solidification systems differing from your FSAR submitted for the issuance of your Operating License be reviewed by you in accordance with 10 CFR Part 50.59. According to this regulation, an internal safety evaluation has to be prepared prior to making the facility modification. With respect to future changes in solidification systems, copies of the safety evaluations along with any additional supporting documentation concerning the safety adequacy of any mobile or temporary solidification system shall be submitted to the NRC. In addition, the appropriate revision to the Process Control Program (PCP) required under the model Radiological Effluent Technical Specifications shall be submitted for review if it has not been previously submitted or if it is being modified. Your PCP should be based on data or tests which demonstrate not only that complete solidification of liquid waste takes place, but that no free standing liquid exists in any waste container leaving your site. The PCP should also be based on data or tests that demonstrate that your waste will have no free standing liquid in excess of the burial ground license requirements at time of burial and that any trace quantities of liquid are non-corrosive. The submittals (the safety evaluation and the revised PCP) should be made prior to the operation of your modified systems.

Sincerely,

Robert & SEderco /for

Darrell G. Eisenhut, Acting Difector Division of Operating Reactors Office of Nuclear Reactor Regulation

Enclosure: Letter and License from State of South Carolina

cc w/enclosure: Short Service List

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South Carolina Department of Health and Environmental Control

BOARD. William M. Wilson, Chairman. J.Lorin Mason, Jr., M.D., Vice-Chairman I. DeQuincey Newman, Secretary Leonard W. Douglas, M.D. George G. Graham, D.D.S. Michael W. Mirns Barbara P. Nuessie

> COMMISSIONER Malcolm U. Dantzler, M.D., M.P.H. 2600 Bull Street Columbia, S.C. 29201

October 30, 1979

Mr. Bruce W. Johnson, President Chem-Nuclear Systems, Inc. P. O. Box 1866 Bellevue, Washington 98009

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Dear Mr. Johnson:

Your South Carolina Radioactive Material License No. 097 has been amended in its entirety by Amendment No. 26. The enclosed license supersedes the original license and all previous amendments.

Amendment of your license was necessary to further define the requirement that there shall be no detectable free standing liquids contained in radioactive waste received and buried at the Barrwell Facility. Other changes reflect clarification of existing license conditions, and additional requirements as previously discussed with the Barrwell Site management.

With respect to license conditions 25. and 32., the terminology "no detectable free standing liquids" will be defined as less than 1% liquid by volume until December 31, 1980. Effective January 1, 1981, waste packages shall contain only trace quantities (not more than 0.5% or 1 gallon per container; whichever is less) of free standing liquids. Any liquids present in waste packages which are allowable until December 31, 1980, shall be non-corrosive with respect to the container. Effective January 1, 1981, the allowable trace quantities of liquid shall also be non-corrosive.

It is the goal of the Department to enhance the stability of the waste forms consigned for burial. To that end, resins with a total specific activity of 1 μ ci/cc or greater, disposed of after June 30, 1981, must be stabilized by solidification. However, in lieu of solid-ification, or other methods such as packaging dewatered resins with only trace quantities of non-corrosive liquids in high integrity containers are being considered at this time.

Century of Service

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Mr. Bruce W. Johnson

It is anticipated that your company will immediately inform your customers of the changes in the amended license and the forthcoming requirements. Should you have any questions, please do not hesitate to contact me.

Very truly yours,

4 Clen Leyword Heyward G. Shealy, Chief

Bureau of Radiological Health

HGS:bo

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Enclosure

cc: Mr. Herbert R. Oakley Vice-President of Nuclear Sites

> Mr. Louis E. Reynolds Director, Regulatory Affairs

Mr. Lee B. Hebbard Barrwell Site Manager

Mr. David G. Ebenhack Manager, Health & Safety

License No. 097

Amendment No. 26 amends License No. 097 in its entirety.

SOUTH CAROLINA DEPARTMENT

OF HEALTH AND ENVIRONMENTAL CONTROL

BUREAU OF RADIOLOGICAL HEALTH

COLUMBIA, SOUTH CAROLINA

RADIOACTIVE MATERIAL LICENSE

Pursuant to the Atomic Energy and Radiation Control Act, Sections 1-400.11 through 1-400.16 of the 1962 Code of Laws of South Carolina and Supplement thereto; and the South Carolina Department of Health and Environmental Control Rules and Regulations Pertaining to Radiation Control, Part III and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This licensee is subject to all applicable rules and regulations of the South Carolina Department of Health and Environmental Control now or hereafter in effect and to any conditions specified below.

· L •	Licensee:	chem-Nuclear Systems, Inc.
2 .	Address:	P. O. Box 726 Barnwell, South Carolina 29812
3.	License No.	097 (Amendment No. 26 amends Radioactive Material License No. 097 in its entirety.)
4.	Expiration Date:	December 31, 1981

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Conditions - General

- 5. Radioactive material, except special nuclear material, may be received, transferred, stored, and disposed of by burial at a site located approximately five miles northwest of Barnwell, South Carolina, at a site located in the Seven Pines School District, Red Oak Township, Barnwell County, South Carolina, within the boundary of the land area described in Lease Agreement dated April 6, 1976. Unless otherwise authorized in this license, only radioactive material consigned for burial shall be received at the site described above.
- 6. The licensee shall comply with the provisions of Title A, State of South Carolina Rules and Regulations for Radiation Control, Part I General Provisions, Part III Standards for Protection Against Radiation, and Part VI Notices, Instructions, and Reports to Workers; Inspections.
- 7. Operations shall be conducted in accordance with Chem-Nuclear Systems, Inc., Radiation Protection and Procedures Manual dated April 4, 1977, and subsequent revisions and additions approved by the Department.
- 8. Operations shall be conducted under the supervision of H. R. Cakley, Robert Posik, John Ott, L. B. Hebbard, Jr., David G. Ebenhack (RPO), Leonard Toner, or other individuals designated by the licensee's Radiation Protection Officer upon completion of the licensee's training program.
- 9. The transportation of radioactive material within the state shall be in accordance with Title A - State of South Carolina Rules and Regulations for Radiation Control, RHA 2.22, "Transportation of Radioactive Materials."
- 10. Radioactive materials authorized by this license are to be received at the site in shipping containers which have been approved by the U. S. Department of Transportation, U. S. Nuclear Regulatory Commission, and subject to final approval by the Department.
- 11. The licensee is not authorized to open any packages at its facility, except for the following:
 - (a) For purposes of repairing or repackaging containers damaged in transit.
 - (b) For purposes of inspecting to insure compliance with the effective Barrwell Site Disposal Criteria.
 - (c) For purposes of returning outer shipping containers.
 - (d) For purposes of retrieving shipment documentation and confirming package contents.

Conditions - General

- 12. A monthly site receipt and burial activities report shall be submitted no later than the 10th day of the following month to the Chief, Bureau of Radiological Health, South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, South Carolina 29201.
- 13. Should any samples taken from trench monitoring wells, cluster wells, or air samples reveal increases in the concentrations of radioactive material which were determined prior to commencement of the burial operations, the licensee shall perform further surveys to determine whether or not the increase is due to the land burial operations. The licensee shall notify the Chief, Bureau of Radiological Health, South Carolina Department of Health and Environmental Control, within 48 hours of any such increases.
- 14. The licensee shall submit results of all scheduled environmental sampling to the Department quarterly.
- 15. The licensee shall maintain all records pertinent to the receipt and burial of radioactive material at the location specified in Condition 5. of this license until authorization is given by the Department for transfer or disposal of said records.
- 16. Licensee is authorized to possess a 100 millicurie Cesium 137 sealed source (Eberline Model No. 64-76A), for the purpose of calibrating portable survey instruments, as outlined in Chem-Nuclear Systems, Inc., Radiation Protection Procedures No. 7: Calibration of Portable Survey Instruments, submitted March 13, 1978.
- 17. A. Each sealed source containing radioactive material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.
 - B. The test shall be capable of detecting the presence of 0.005 microcuries of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Department.

Conditions - General

- C. If the test reveals the presence of 0.005 microcuries or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance . with Department regulations. A report shall be filed within 5 days of the test with the Chief, Bureau of Radiological Health, S. C. Department of Health and Environmental Control, 2600 Bull Street, Columbia, South Carolina 29201, describing the equipment involved, the test results, and the corrective action taken.
- 18. Tests for leakage and/or contamination shall be performed by the Licensee or by other persons specifically authorized by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such service.
- 19. The licensee may receive and process waste shipments only during normal working hours as specified in the effective Barravell Site Disposal Criteria.

Conditions - Waste

- 20. The licensee shall not receive, possess, or have in his possession at the location specified in Condition 5., at any one time unburied radioactive material in excess of:
 - (a) 50,000 curies of radioactive material excluding source and special nuclear materials;
 - (b) 60,000 pounds of source material.
- 21. The licensee shall insure that all waste received at the site described in Condition No. 5 is packaged and prepared in accordance with the conditions of this license and the effective Barrwell Site Disposal Criteria. Any changes made to the Site Criteria shall have prior approval by the Department.
- 22. Unless specifically authorized, all radioactive waste shall be received and buried in appropriate containers.
- 23. A seven-day written notification shall be submitted to the Department by the licensee of radioactive material shipments to be received in excess of 2500 curies per shipment with the exception of tritium shipments.
- 24. Unless otherwise authorized, the licensee shall not receive waste containing any transuranic elements. However, waste containing less than 10 nanocuries total transuranic nuclides per gram of waste is acceptable provided transuranic nuclides are evenly distributed within a homogeneous waste form. This license condition does not authorize receipt or burial of components or equipment contaminated with transuranic nuclides.

- 25. Unless otherwise specified in this license, the licensee shall not receive any liquid radioactive waste regardless of the chemical or physical form. Solidified radioactive waste shall have no detectable free standing liquids.
- 26. The licensee shall not receive waste in any month in excess of the volume limits specified in the schedule below. The licensee shall insure that waste generated in South Carolina which is acceptable for burial under all other terms and conditions of this license and the effective Barrwell Site Disposal Criteria is received, and that this waste is within the volume limit specified for that month.

Volume Limitation Schedule

Month and Year	Volume Limit in Cubic Feet
November, 1979	189.000
December, 1979	189.000
January, 1980	178,000
February, 1980	178.000
March, 1980	178,000
April, 1980	167.000
May, 1980	167.000
June, 1980	167.000
July, 1980	156.000
August, 1980	156.000
September, 1980	156.000
October, 1980	144.500
November, 1980	144,500
December, 1980	144,500
January, 1981	133,500
February, 1981	133,500
March, 1981	133,500
April, 1981	122,500
May, 1981	122,500
June, 1981	122,500
July, 1981	111,000
August, 1981	111,000
September, 1981	111,000
October, 1981	100,000
November, 1981	100,000
December, 1981	100,000
January, 1982 and each month thereafter	100,000
or until this condition is otherwise amend	ieđ.

27. The licensee shall not receive toluene, xylene, dioxane, scintillation liquids, or other organic liquids with similar chemical properties; or containers which have at any time contained any of the liquids mentioned above. However, after complete incineration, the ash and/or residue from these wastes are acceptable.

Conditions - Waste

- 28. The licensee shall not receive or bury radioactive waste containing more than one (1) percent absorbed oil by volume.
- 29. Waste containing both toxic chemicals and radioactive materials shall require an independent evaluation of both hazards. If the chemical hazard exceeds the radiological hazard, the waste containing both radioactive material and chemically toxic waste shall not be buried at the site as described in Condition No. 5 except as specifically approved by the Department. Records of hazard evaluation of such wastes performed by the licensee shall be kept for inspection by the Department.
- 30. The licensee shall not store any package containing radioactive material or source material for a period greater than six months from the date of receipt of the package prior to burial.
- 31. The licensee may receive liquids solidified with one of the following solidification media provided the requirements of other conditions as specified in this license are met:
 - (a) Dow media
 - (b) Cement
 - (c) Urea Formaldehyde
 - (d) Asphalt
 - (e) Delaware Custom Media
 - (f) Solidification media and processes reviewed and approved by the U.S.N.R.C.; Office of Nuclear Reactor Regulations, subject to final approval by the S. C. Department of Health and Environmental Control, Bureau of Radiological Health.
- 32. Ion exchange resins and filter media may be received in a dewatered form for transportation and subsequent burial and shall contain no detectable free standing liquids.
- 33. The licensee shall maintain records of isotopic analysis (quantitative and qualitative) for each package containing ion exchange resins received at the site.
- 34. The licensee shall not receive evaporator bottoms, concentrates, or other wastes containing free standing liquids unless they meet the requirements as specified in Condition 31. of this license, prior to receipt at the site.

Conditions - Waste

35. Effective November 1, 1979, the licensee shall insure that each Radioactive Shipment Record form used to describe a low-level radioactive waste shipment received at the Barrwell Site has the following certification properly executed by a representative of the shipper/generator of the waste:

"Certification is hereby made to the South Carolina Department of Health and Environmental Control that this shipment of low-level radioactive waste has been inspected in accordance with the requirements of South Carolina Radioactive Material License No. 097, as amended, U. S. Nuclear Regulatory Commission License No. 46-13536-01, as amended, and the effective Barnwell Site Disposal Criteria within 48 hours prior to shipment; and further certification is made that the inspection revealed no items of non-compliance with all applicable laws, rules and regulations.

Date:		By:		
Title and Or	ganization:			
Telephone No	• ()		-	11

- 36. The licensee shall insure that any package used as the final burial container shall be of such material and construction that there will be no significant chemical, galvanic, or other reaction among the packaging components, or between the packaging components and the package contents.
- 37. The licensee may bury Krypton 85 and Xenon 133 gaseous sources provided they meet the following criteria:
 - (a) Burial containers must be approved by the Department of Transportation.
 - (b) Internal pressure of containers may not exceed 1.5 atmospheres.
 - (c) Total activity of containers may not exceed 100 curies each.
 - (d) Containers must be buried in an upright position with a minimum spacing of ten (10) feet.

Conditions - Site

- 38. A registered surveyor must verify and document the location of each trench: (a) prior to the beginning of trench construction; (b) at the completion of trench construction, prior to the initiation of the burial operations; and (c) at the completion of the grading and seeding operation.
- 39. Construction of radioactive waste burial trenches, slit trenches, "Toner Tubes", trench monitoring wells and site cluster wells shall be constructed as specified in Chem-Nuclear Systems, Inc., Trench Construction Detail Drawings No. 500.101, dated December 12, 1978. Any changes to these specifications must have approval from the Department before construction begins.

Conditions - Site

- 40. Monitoring wells in clusters will be placed outside the trenches but in the trench area. Specific locations shall be determined through consultation. The initial well of a cluster will be core drilled to the water table and a representative sample of the core shall be submitted to the Department. The depth and number of additional wells in the cluster are to be determined by the sand-clay composition observed in the initial core. All wells shall be grouted, sealed, and capped.
- 41. The licensee shall not initiate burial operations in newly excavated trenches until the Department has inspected and approved the trenches. An initial inspection will be made by the Department upon completion of excavation of the trench, sumps, french drain inside the trench, drainage ditches adjacent to the trench and installation of monitoring well standpipes. An intermediate inspection will be made by the Department after the french drain and sumps have been filled with rock. A final inspection will be made by the Department upon completion of construction requirements per Trench Construction Detail Drawings No. 500.101 dated December 12, 1978.
- 42. Each well and "Toner Tube" must be sufficiently capped or covered to prevent the introduction of any extraneous material.
- 43. Open trenches and partially filled trenches shall be protected to prevent runoff water from entering trenches. Radioactive waste shall not be placed into trench areas where water has accumulated. Eurial of radicactive waste into trenches with unusual amounts of water shall immediately cease until corrective action has been taken and origin of water determined.
- ⁴⁴. The licensee shall maintain a minimum of two feet of compacted clay between the last layer of waste and the surface of the ground. Backfilling shall commence immediately as waste reaches the top elevation of the trench. Uncovered wastes shall not extend more than 100 feet beyond the backfilled portion of the trench. Upon completion of burial operations in a burial trench, the licensee shall add an additional three feet minimum of earth on top of the two foot cover. Completed trenches shall at no time be used for stockpiling earth not withstanding provisions for a final grading plan.
- 45. The cover over the completed burial trenches at the site specified in Condition 5. of this license shall be maintained to minimum erosion.
- 46. The disposal area and cover of the trenches shall be arranged and graded in such a manner that all surface runoff water shall be completely removed from the vicinity of the trenches.
- 47. Temporary trench boundary markers and trench identification markers shall be erected upon completion of backfill operations until permanent granite markers are installed.

Conditions - Site

- 48. All wells constructed at the site specified in Condition 5. of this license shall be protected from damage.
- 49. Interim or final grades shall be established and seeding of trench covers shall commence at no more than one year following final trench burial operations.
- 50. A series of granite markers, one at the end of each completed trench and on each corner, shall be erected upon completion of the seeding of trench covers. The following information shall be inscribed on the end monument, and this information shall be reported to the Chief, Bureau of Radiological Health, South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, South Carolina 29201.
 - a. Total activity of radioactive material in curies excluding source and special nuclear materials, total amount of source material in pounds, and total amount of special nuclear material in grams in the trench.
 - b. Date of completion of the burial operations; and
 - c. Volume of waste in the trench.
- 51. The licensee may not exhume previously buried waste.
- 52. As material buried may not be transferred by abandonment or otherwise, unless specifically authorized by the Department, the expiration date on this license applies only to the above ground activities and to authority to bury radioactive material wastes at the site specified in Condition No. 5. The license continues in effect and the responsibility and authority for possession of buried radioactive material wastes continues until the Department finds that the plan established for preparation of the Barnwell site for transfer to another person has been satisfactorily implemented in a manner to reasonably assure protection of the public health and safety and the Department takes action to terminate your responsibility and authority under this license. All requirements for environmental monitoring, site inspection, and maintenance, and site security continue whether wastes are being buried or not.
- 53. Site closure and stabilization of the licensee's facility shall be accomplished in accordance with the U. S. Nuclear Regulatory Commission's Low-Level Waste Branch Position entitled, "Low-Level Waste Burial Ground Site Closure and Stabilization," Revision 1 dated May 17, 1979. A copy of the performance objectives is attached.

- 54. Prior to May 31, 1980, a preliminary plan for preparation of the site for transfer to another person who would only passively hold the site shall be submitted for review. The plan shall be consistent with Condition 53. of this license and shall include demonstration that funds are being set aside or other measures being taken are adequate to finance the site closure plan. The plan shall also include preliminary estimates of costs, environmental impacts, data needs, personnel needs, material and equipment needs, planned documentation and quality assurance, and detailed plan for trench locations and elevations, expected capacities, planned surface contours, and buffer zones.
- 55. Prior to May 31, 1980, a reassessment of current operating practices shall be submitted. The reassessment shall consider the objectives of the site plan specified in the preceding paragraph and any changes in operation at the site which would enhance implementation of the plan.
- 56. The licensee shall submit an updated plan and operational assessment every five years for review.
- 57. One year prior to the anticipated transfer of the site and buried radicactive materials to another person (including an agency of the U.S. Government) the licensee shall submit a final version of the site preparation plan including a schedule for implementation of all remaining plan elements prior to transfer, and a description of the mechanics of orderly transfer in coordination with the transferee.
- 58. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Condition 20. of this license in accordance with statements, representations, procedures, and site criteria, heretofore made by the licensee in application for and subsequent to the issuance of S. C. Radioactive Material License No. 097, and amendment thereto.

For The South Carolina Department of Health and Environmental Control

Date of Issuance October 30, 1979

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Bureau of Radiological Hearth

REPORT OF MEETING ON RADIOACTIVE LOW-LEVEL WASTE WITH SOUTH CAROLINA OFFICIALS, OCTOBER 17-19, 1979

NRC representatives from NRR, NMSS, SD, SP, IE, DOE and EG&G-Idaho (DOE lead contractor for low level waste) met with officials from the State of South Carolina (see Attachment No. 1) and visited the low-level waste burial site at Barnwell, South Carolina. The meeting was held as the result of an earlier discussion between Ken Perkins, SD, and Lamar Priester, Director, South Carolina Division of Energy Resources, at which a commitment was made to hold an information exchange meeting amoung the concerned State and federal agencies. Another purpose for meeting was to discuss specifically the revision being made by the South Carolina Department of Health and Environmental Control (DHEC) to the license that is issued to Chem-Nuclear Systems, Inc. to operate the Barnwell facility. A copy of the itinerary for the trip is enclosed as Attachment 2.

On the afternoon of October 17, R. L. Bangart (DSE/NRR), L. H. Barrett (DOR/NRR), G. Bidinger (IE), K. Schneider (SP), and R. Dale Smith (WM/NMSS) met with Heyward Shealy (DHEC) and members of his staff to discuss the Order issued to Commonwealth Edison prohibiting low-level waste transport into South Carolna, and to discuss the contents of a draft letter to the president of Chem-Nuclear Systems, Inc. which explains the implementation policy of South Carolina regarding free standing liquid and resin solidification. At this meeting G. Bidinger invited DHEC inspectors to accompany IE inspectors on inspections of waste management programs of NRC licensees which DHEC had identified as problem shippers (such as Commonwealth Edison). NRC representatives suggested that some modifications to the DHEC draft letter (Attachment 3) to B. Johnson of Chem Nuclear regarding free standing liquid and resin solidification might be appropriate. H. Shealy agreed to discuss our recomended changes. After discussions amoung NRC representatives on the evening of October 17, suggested changes (as shown in Attachment 4) were given to H. Shealy on October 18. After discussions held on the afternoon of October 19, the changes shown in Attachment 5 were agreed to by DHEC and NRC as being appropriate. During this meeting, both NRR and IE representatives agreed that low-level waste from reactor sites should contain no (zero) free standing liquids at the time of shipment. However, because of factors which occur during transportation (such as freeze-thaw cycling and vibrational effects), it is recognized by both DHEC and NRC that small quantities of liquid may be present at the time of burial.

October 18 began with all NRC and DOE representatives shown on Attachment 1 meeting with David Reid, Executive Assistant to Governor Riley, Lamar Priester, Director, South Carolina Division of Energy Resources, Larry LeFebvre, Deputy Director of Policy Analysis and Planning, Division of Energy Resources, and Heyward Shealy, Chief,

Enclosure 2

Bureau of Radiological Health, DHEC. For over an hour the South Carolina officials, lead by Mr. Reid, explained the policies of Governor Riley with respect to the burial ground operations at Barnwell and low-level waste management in general. It was stated the volume of waste authorized for burial will be reduced over the next two years to 1/2 of that volume now authorized. Mr. Reid made it clear that enforce-. ment actions including the issuance of Orders to prohibit shipment of waste into South Carolina, will be taken against those who ship or transport waste that is not in compliance with applicable state or federal regulations. Statutory authority to issue civil penalties against violators is also being sought. Mr. Reid strongly urged the NRC to take actions which will lead to the creation of more burial ground facilities in the U.S. in order to lift the burden that South Carolina is facing. He suggested such actions as early publication of 10 CFR Part 61, "Disposal of Low-Level Radioactive Waste and Low Activity Bulk Solid Waste," NRC review of burial ground license applications in advance of the adoption of 10 CFR Part 61, and not issuing operating licenses to nuclear power plants unless adequate low-level waste disposal capacity can be predicted for the life of the plant. In addition, Mr. Reid emphasized that in a November 6, 1979 meeting to be held with Chairman Hendrie the Governors of South Carolina, Nevada and Washington will be seeking additional "guarantees" that inspection efforts will be increased to provide further assurances that only waste that is in compliance with applicable regulations will be shipped. Other NRC actions that demonstrate that positive stops are being taken to solve the problems of low-level waste are being sought also.

The remainder of October 18 was spent by NRC and DOE representatives, accompanied by H. Shealy, visiting the burial ground at Barnwell, South Carolina. After a briefing by H. R. Oakley, Vice President of Nuclear Sites, Chem-Nuclear Systems, Inc., the group toured the site. We observed the administrative areas, trucks lined up waiting to enter the site, the control building for site access, the storage area for new liners (manufactured locally), the "slit" trench for buriaI of irradiated components, the completion of a liner offloading into the buriaI trench, offloading of drums (shoved from the back of a truck at the edge of the trench), stacking of LSA wooden boxes within the trench with a forklift, earthmoving operations, monitoring wells and standpipes in the trenches, markers designating completed trenches, radiation surveying operations, and South Carolina and NRC inspection activities. The site employs over 100 people and is authorized presently for disposal of 2.1 million ft³ of waste per year. The trenches are backfilled so that a 10 foot layer of clay is placed on top of the waste. Information brochures on Chem-Nuclear Services, Inc. were distributed and may be obtained from R. L. Bangart for review.

The morning of October 19 was spent meeting with L. Priester, L. LeFebvre (both of Division of Energy Resources) and Joyce Marchand (with the Staff of the Joint Committee on Energy) to discuss the topics identified on the itinerary. These discussions were mostly concerned with the definition of responsibilities between NRC and DOE, short and long range programs of DOE, and South Carolina's concerns about and relationships to the federal programs. During this meeting, South Carolina officials emphasized their belief that reactor licensee applications should be reviewed for the determination that adequate low-level waste disposal capacity exists. The afternoon was spent meeting with DHEC officials to reach agreement on the wording of the letter to B. Johnson, as discussed in the second paragraph of this report. A summary of the agreed upon DHEC positions is as follows:

- 1. "No detectable free standing liquids" will be defined as less than 1% liquid (non-corrosive with respect to the container) by volume until December 31, 1980. Effective January 1, 1981, waste packages shall contain only trace quantities (not more than 0.5% of 1 gallon per container, which-ever is less) of free standing non-corrosive liquids.
- 2. To enhance the stability of waste forms, resins with an activity level of long-lived (greater than t1/2 = 5 years) isotopes greater than 1 uCi/cc disposed of after July 1981 shall be stabilized by solidification or an equivalent method, such as packaging dewatered resins in a high integrity container, e.g. reinforced concrete.

The high integrity container alternative was proposed by DOR and South Carolina may, in the future, request NRC to review for acceptability containers that may be proposed for use. DOR has lead action for developing acceptance criteria for use in the review of improved burial containers.

The day ended with a tour of DHEC's laboratory and mobile radiological analysis facilities. From both the NRC's and South Carolina's standpoints, an informative and constructive interchange had been accomplished during the 3-day period.

Enclosures:

- 1. Attendee list
- 2. Itinerary for Trip
- 3. Draft letter to President of Chem-Nuclear, Inc.
- 4. Initial Comments on draft letter to Chem-Nuclear
- 5. Final Comments on draft letter to Chem-Nuclear

PARTICIPANTS IN THE OCTOBER 17-19, 1979 MEETING IN COLUMBIA, SOUTH CAROLINA TO DISCUSS LOW-LEVEL RADIOACTIVE WASTE

Cathy Schneider, Office of State Programs Robert Brown, Office of Nuclear Material Safety & Safeguards Dale Smith, Low Level Waste Management Operations Dick Bangart, Office of Nuclear Reactor Regulation Lake Barrett, Office of Nuclear Reactor Regulation Ken Perkins, Office of Standards Development George Bidinger, Office of Inspection & Enforcement Jim Dieckhoner, <u>DOE</u> Low Level Waste Office George Levine, <u>DOE</u> LLW contractor, Idaho National Laboratory David Reid, Executive Assistant to Governor Riley Lamar Priester, Director, S. Carolina Div. of Energy Resources Larry LeFebvre, Deputy Dir. of Policy Analysis & Planning, Division of Energy Resources Joyce Marchand, Staff of S. Carolina Joint Committee on Energy Heyward G. Shealy, Chief, Bureau of Radiological Health,

South Carolina Department of Health & Environmental Control (DHEC)

Emory Williams, Bureau of Radiological Health, DHEC Virgil Autry, Bureau of Radiological Health, DHEC Bill House, Bureau of Radiological Health, DHEC Mike Tkacik, Bureau of Radiological Health, DHEC Herbert R. Oakley, Director of Nuclear Sites, Chem-Nuclear Systems, Inc.

TENTATIVE

ATTACHMENT 2

ITINERARY NUCLEAR REGULATORY COMMISSION VISIT COLUMBIA, SOUTH CAROLINA--OCTOBER 17, 18, 19, 1979

TRIP PURPOSE: Meet with South Carolina technical and policy officials to review pending NRC low-level radioactive waste regulation and implementation timetable, and discuss associated issues.

NRC OFFICIALS MAKING THE TRIP:

Cathy SchneiderOffice of	State Programs
Robert BrownOffice of	Nuclear Material Safety & Safeguards
Dale SmithLow Level	Waste Management Operations
Dick BangartOffice of	Nuclear Reactor Regulation
Lake BarrettOffice of	Nuclear Reactor Regulation
-Pat-Camilla	-Standards Development-
Ken PerkinsOffice of	Standards Development
George BidingerOffice of	Inspections & Enforcement
Jim DieckhonerDOE Low L	evel Waste Office
George LevinDOE LLW C	ontractor, Idaho National Laboratory

WEDNESDAY, OCTOBER 17

NRC Staff arrivals and afternoon meetings with Heyward Shealy, S.C. DHEC.

THURSDAY, OCTOBER 18

9:00-10:00am	Governor's Conference Room, State House Meeting with David Reid, Executive Assistant
10:00-11:30am	Travel to Chem-Nuclear LLW Disposal Facility
11:30-12:30pm	Lunch (Somewhere in route to C-N, Barnwell?)
12:30- 3:00pm	Tour Chem-Nuclear
3:00- 4:00pm	Return to Columbia
4:00- Open	Meeting with Div. of Energy Resources & Joint Legislative Committee on Energy Staff (place to be determined).

FRIDAY, OCTOBER 19

9:00am-5:00pm

Room 507, Gressette Office Building - Informal discussion of following low-level radioactive waste topic areas:

- 1 Waste Forms, particularly dealing with free-standing liquids
- 2 High volume, low specific activity waste
- 3 Regionalization of waste sites and programs
- 4 DOE-vs.-NRC roles in LLW planning
- 5 Need for stepped up inspection activities on the part of NRC and Agreement States
- 6 Inspection focus: at waste originator-vs.-waste disposal facility
- 7 Follow-up status report to recent NRC/DOT visit to S.C.

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TACHMENT 3

BOARD

DRAFT

William M. Wilson, Chairman William C. Moore, Jr., D M.D., Vice-Chairman 1. DeQuincey Newman, Secretary Leonard W. Douglas, M.D. George G. Graham, D.D.S. J. Lorin Mason, Jr., M.D. C. Maurice Patterson

> COMMISSIONER Albert G. Randall, M.D., M.P.H. 2600 Bull Street Columbia, S.C. 29201

Mr. Bruce W. Johnson, President Chem-Nuclear Systems, Inc. / P.O. Box 1866 Bellevue, Washington 98009

Dear Mr. Johnson:

1878

Your South Carolina Radioactive Material License No. 097 has been amended in its entirety by Amendment No. 26. The enclosed license supersedes the original license and all previous amendments.

Amendment of your license was necessary to further define the requirement that there shall be no detectable free standing liquids contained in radioactive waste received and buried at the Barnwell Facility. Other changes reflect clarification of existing license conditions and additional requirements as previously discussed with the Barnwell Site management.

Nith respect to license conditions 25 and 31, the terminology "no detectable free standing liquids" will presently be defined as less than 1% liquid by will be to allow only trace quantities (0.5% cr _ gallon per container: whichever is less) of non-corrosive liquids due to concensate.

lexatered resins, i.e., resins from which all detectable free standing liquids have been removed, will be acceptable for receipt and disposal at the facility until December 31, 1980. Effective January 1, 1981, all ion exchange resins recan ed for burial shall be solidified with an appropriate solidification mache approved by the Department and shall contain only trace quantites of zie: standing liquids. A future amendment will be forthcoming to reflect this requirement.

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Mr. Bruce W. Johnson Page 2

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It is anticipated that your company will immediately inform your customers of the changes in the amended license and the forthcoming requirements. Should you have any questions, please do not hesitate to contact me.

Very truly yours,

Heyward G. Shealy, Chief Bureau of Radiological Health

HGS:mig

Enclosure

cc: Mr. Herbert R. Oakley Vice-President of Nuclear Sites

> Mr. Louis E. Reynolds Director, Regulatory Affairs

Mr. Lee B. Hebbard Barnwell Site Manager

Mr. David G. Ebenhack Manager, Health & Safety Suggested changes to draft letter to Bruce Johnson

Paragraph 3: Delete and replace with:

With respect to license conditions 25 and 31, the terminology "no detectable free standing liquids" will be defined as less than 1% liquid by volume until December 31, 1980. Effective January 1, 1981, waste packages shall contain only trace quantities (not more than 0.5% or 1 gallon per container; whichever is less) of free standing liquids Any Liquids present in waste packages which are allowable until December 31, 1980 shall be non-corrosive with respect to the container. Effective January 1, 1981 the allowable trace quantities of liquid shall be non-corrosive.

Paragraph 4: Delete and replace with:

It is the goal of South Carolina to enhance the stability of the waste forms consigned for burial. To that end, <u>high-revet</u> resins (>10u Ci/cc of isotopes with half lives greater than by years) disposed of after July 1981 must be stabilized by solidification or an equivalent method such as packaging dewatered resins in a high integrity container e.g. reinforced concrete. Supported changes to draft letter to Bruce Johnson

Paragroph 3: Delete and replace-with:

With respect to license conditions 25 and 31, the terminology "no detectable free standing liquids" will be defined as less than 1% liquid by volume until December 31, 1980. Effective January 1, 1981, waste packages shall contain only trace quantities (not more than 0.5% or 1 gallon per container; whichever is less) of free standing liquids. Any liquids present in waste packages which are allowable until December 31, 1980 shall be non-corrosive with respect to the container. Effective January 1, 1981 the allowable trace quantities of liquid shall be non-corrosive.

Paragraph 4: Delete and replace with:

It is the goal of South Carolina to enhance the stability of the waste forms consigned for burial. To that end, hip i level resins with an actually (>244 Ci/cc of isotopes with half lives greater than life years) disposed of after July 1981 must be stabilized by solidification or an equivalent method such as packaging devatered resins in a high integrity container e.g. reinforced concrete.

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Mr. Hugh G. Parris - Tennessee Valley Authority 50-259 50-260

50-296

CC:

H. S. Sanger, Jr., Esquire General Counsel Tennessee Valley Authority 400 Commerce Avenue E 11B 33 C Knoxville, Tennessee 37902

Mr. Ron Rogers Tennessee Valley Authority 400 Chestnut Street, Tower II Chattanooga, Tennessee 37401

Mr. E. G. Beasley Tennessee Valley Authority 400 Commerce Avenue W 10C 131C Knoxville, Tennessee 37902

Robert F. Sullivan U. S. Nuclear Regulatory Commission P. O. Box 1863 Decatur, Alabama 35602

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