

August 22, 2007

Mr. C. Earl Hunter  
Commissioner  
South Carolina Department of  
Health and Environmental Control  
2600 Bull Street  
Columbia, SC 29201

Dear Commissioner Hunter:

The U.S. Nuclear Regulatory Commission (NRC) uses the Integrated Materials Performance Evaluation Program (IMPEP) in the evaluation of Agreement State programs. Enclosed for your review is the draft IMPEP report, which documents the results of the Agreement State review held in South Carolina on July 16-20, 2007. I was the team leader for the review. The review team's preliminary findings were discussed with you and your staff on the last day of the review. The review team's proposed recommendations are that the South Carolina Agreement State Program be found adequate to protect public health and safety and compatible with the NRC's program.

NRC conducts periodic reviews of Agreement State programs to ensure that public health and safety are adequately protected from the potential hazards associated with the use of radioactive materials and that Agreement State programs are compatible with the NRC's program. The process, titled IMPEP, employs a team of NRC and Agreement State staff to assess both Agreement State and NRC Regional Office radioactive materials programs. All reviews use common criteria in the assessment and place primary emphasis on performance. Three additional areas applicable to your program have been identified as non-common performance indicators and are also addressed in the assessment. The final determination of adequacy and compatibility of each Agreement State program, based on the review team's report, is made by a Management Review Board (MRB) composed of NRC managers and an Agreement State program manager, who serves as a liaison to the MRB.

In accordance with procedures for implementation of IMPEP, we are providing you with a copy of the review team's draft report for your review and comment prior to submitting the report to the MRB. Comments are requested within four weeks from your receipt of this letter. This schedule will permit the issuance of the final report in a timely manner that will be responsive to your needs.

The team will review the response, make any necessary changes to the report, and issue it to the MRB as a proposed final report. Our preliminary scheduling places the South Carolina MRB meeting in the week of October 1, 2007. I will coordinate with you to establish the date for the MRB review of the South Carolina report. The NRC will provide invitational travel for you or your designee to attend the MRB. The NRC has video conferencing capability if it is more convenient for the State to participate through this medium. Please contact me if you desire to establish a video conference for the meeting.

C. Earl Hunter

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August 22, 2007

If you have any questions regarding the enclosed report, please contact me at (301) 415-2322.

Thank you for your cooperation.

Sincerely,

*/RA/*

Richard L. Blanton  
Health Physicist  
Division of Materials Safety and State Agreements  
Office of Federal and State Materials  
and Environmental Management Programs

Enclosure:  
As stated

cc w/ encl: Aaron A Gantt, Program Director  
South Carolina Bureau of Radiological Health

Richard Haynes, P.E., Director  
South Carolina Division of Waste Management

C. Earl Hunter

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INTEGRATED MATERIALS PERFORMANCE EVALUATION PROGRAM  
REVIEW OF THE SOUTH CAROLINA AGREEMENT STATE PROGRAM

JULY 16-20, 2007

**DRAFT REPORT**

U.S. Nuclear Regulatory Commission

**Enclosure**

## 1.0 INTRODUCTION

This report presents the results of a review of the South Carolina Agreement State Program. The review was conducted during the period of July 16-20, 2007, by a review team comprised of technical staff members from the U.S. Nuclear Regulatory Commission (NRC), the Commonwealth of Massachusetts, and the State of Texas. Team members are identified in Appendix A. The review was conducted in accordance with the "Implementation of the Integrated Materials Performance Evaluation Program and Rescission of Final General Statement of Policy," published in the Federal Register on October 16, 1997, and the February 26, 2004, NRC Management Directive 5.6, "Integrated Materials Performance Evaluation Program (IMPEP)." Preliminary results of the review, which covered the period of June 13, 2003, to July 20, 2007, were discussed with South Carolina management on the last day of the review.

[A paragraph on the results of the Management Review Board (MRB) meeting will be included in the final report.]

The South Carolina Agreement State Program is located in the Department of Health and Environmental Control (the Department). Within the Department, the Division of Radioactive Waste Management (the Division) in the Bureau of Land and Waste Management under the Deputy Commissioner for Environmental Quality Control is responsible for the oversight of the Barnwell radioactive waste disposal site and approximately 14 other licenses for waste-related operations. The Bureau of Radiological Health (the Bureau) under the Deputy Commissioner for Health Regulation administers the remainder of the radioactive materials program. Organization charts for the Department, the Division, and the Bureau are included as Appendix B.

At the time of the review, the South Carolina program regulated approximately 380 specific licenses authorizing Agreement materials in addition to the Barnwell site. The review focused on the program as it is carried out under the Section 274b. (of the Atomic Energy Act of 1954, as amended) Agreement between the NRC and the State of South Carolina.

In preparation for the review, a questionnaire addressing the common and non-common performance indicators was sent to the State on April 9, 2007. The Bureau and the Division provided responses to the questionnaire on May 16, 2007, and June 26, 2007, respectively. Copies of the questionnaire responses can be found in the NRC's Agencywide Document Access and Management System (ADAMS) using Accession Number ML072330456.

The review team's general approach for conduct of this review consisted of: (1) examination of South Carolina's response to the questionnaire; (2) review of applicable South Carolina statutes and regulations; (3) analysis of quantitative information from the Bureau's database; (4) technical evaluation of selected regulatory actions; (5) field accompaniments of four South Carolina inspectors; and (6) interviews with staff and management to answer questions or clarify issues. The review team evaluated the information gathered against the established criteria for each common and applicable non-common performance indicator and made a preliminary assessment of the Agreement State program's performance.

Section 2.0 of this report discusses the NRC's actions in response to recommendations made during the previous review. There were no recommendations made to the State during the

previous review. Results of the current review of the common performance indicators are presented in Section 3.0. Section 4.0 discusses results of the applicable non-common performance indicators, and Section 5.0 summarizes the review team's findings and recommendations.

## 2.0 STATUS OF ITEMS IDENTIFIED IN PREVIOUS REVIEWS

During the previous IMPEP review, which concluded on June 13, 2003, two recommendations were made to NRC. The team's review of the current status of these recommendations is as follows:

1. The review team recommends that NRC adopt and disseminate final guidance on field inspections for industrial radiography operations in the interest of establishing an identifiable national materials program standard. (Section 3.3 of the 2003 report)

Current Status: The 2003 review team noted that many industrial radiography inspections were office, not field, inspections. One licensee was not inspected in the field during a total of eight years. The 2003 review team noted that a Temporary Instruction (TI) was implemented by the NRC that provided for an increased frequency for field inspections. The 2003 review team recommended that NRC adopt and disseminate final guidance on field inspections for industrial radiography operations in the interest of establishing an identifiable national materials program standard.

The current review team is unable to determine if the final guidance has been issued. Although the TI referenced by the 2003 team is not listed as a current TI, NRC Inspection Procedure 87121, reissued on August 22, 2005, does not indicate a change to the guidance on field inspections. As well, NRC's Inspection Manual Chapter (IMC) 2800 was reissued September 28, 2005, but no change to the guidance relevant to this recommendation is indicated. A review of the All Agreement States Letters from 2003 to present uncovered no letter forwarding revised guidance to the States. Discussions with cognizant NRC staff disclosed no specific action relative to the closing of this recommendation. This recommendation remains open.

2. The review team recommends that NRC clarify which supervisory levels require an inspection accompaniment, the frequency of those accompaniments and what level of documentation is appropriate. (Section 3.3 of the 2003 report)

In the 2005 revision of the FSME Procedure SA-102, the following question and answer was added in Appendix C, *Frequently Asked Questions*, to provide interim guidance.

Q: If a supervisor routinely performs inspections in an Agreement State, should the supervisor be accompanied annually also?

A: Yes, supervisors who routinely perform inspections should be accompanied. During an IMPEP review in 2003, a recommendation was made to the NRC to develop specific guidance on what level of supervisor needs to be accompanied, how often, and what documentation is necessary. **Until this guidance is finalized**, it should be assumed that any supervisor

that performs inspections should be accompanied at least annually. (Emphasis added)

The review team determined that the final guidance has not been developed and issued. This recommendation remains open.

In light of the relatively low risk significance of the recommendations and the need to address higher priority work, the review team is less concerned that the recommendations remain open than it is about the lack of central documentation and working knowledge of the continuing consideration of the recommendations. Over the 4-year review period, significant changes of NRC organization and staff have occurred. Considering projections of future staff turnover and office relocations, the review team is concerned that the handling of these recommendations demonstrates the potential for recommendations to NRC by IMPEP teams becoming lost. The review team recommends strengthening the system for tracking such recommendations.

### 3.0 COMMON PERFORMANCE INDICATORS

IMPEP identifies five common performance indicators to be used in reviewing both NRC Regional and Agreement State radioactive materials programs. These indicators are: (1) Technical Staffing and Training, (2) Status of Materials Inspection Program, (3) Technical Quality of Inspections, (4) Technical Quality of Licensing Actions, and (5) Technical Quality of Incident and Allegation Activities.

#### 3.1 Technical Staffing and Training

Issues central to the evaluation of this indicator include the State's staffing level and staff turnover, as well as the technical qualifications and training histories of the staff. To evaluate these issues, the review team examined the State's questionnaire response relative to this indicator, interviewed Program management and staff, reviewed job descriptions and training records, and considered any possible workload backlogs.

The radioactive materials program in the Bureau is staffed by the Bureau Chief, a Radioactive Materials Division Director, a Radioactive Materials Program Manager, and four health physicists. In response to the questionnaire, the Bureau reported that the Bureau Chief spends approximately 50 percent of his effort supervising the radioactive materials program, while the Division Director and Program Manager devote all of their time to the program. Both the Program Manager and the Division Director perform licensing, inspection, and event response activities.

Since the last review, the former Bureau Chief retired and the former Industrial Program Manager left the Bureau. The Bureau used the departures as an opportunity to reorganize and replaced the Program Manager position with an entry-level staff position. Both the Bureau Chief and the staff positions were filled within a reasonable time. The Bureau's radioactive materials program is currently fully staffed. The review team concluded that the staffing level in the Bureau is adequate.

The Division is responsible for the Barnwell site, radioactive waste related licensees, and decommissioning activities. The Division is currently fully staffed. Details of the Division's staffing and training are discussed in Section 4.3.1.

The qualifications of the Bureau's staff were determined from the questionnaire, training records, and interviews of personnel. The Bureau has a documented training program for new staff that is comparable to the NRC/Organization of Agreement States, Inc., Working Group Recommendations for Agreement State Training Programs. The staff are qualified from an education and experience standpoint; all have Bachelor's degrees in the sciences or equivalent training and experience. The experienced license reviewers/inspectors have attended the training courses as prescribed by IMC1246 and have received training in the areas needed for their assignments. They are familiar with South Carolina regulations, policies, and procedures. Management is supportive of staff training and demonstrated a commitment to staff training during the review period. The training of new staff is preceding according to the Bureau's training plan, with minor delays due to limited availability of slots at NRC training course sessions for which they apply.

The review team discussed the role of the Technical Advisory Radiation Control Council (the Council) with the Bureau Chief. The Council holds statutory authority to review all proposed regulations prior to adoption. The Council also serves as an advisory committee to both the Bureau and the Division. In the past, the Council met twice a year, or as needed. Since the last review, the Council has met only once. The Council is authorized to review and approve proposed regulations by e-mail and has done so. No evidence of any conflict of interest issues were identified. Council members are subject to the State Ethics Act.

Based on the IMPEP evaluation criteria, the review team recommends that South Carolina's performance with respect to the indicator, Technical Staffing and Training, be found satisfactory.

### 3.2 Status of Materials Inspection Program

The review team focused on five factors while reviewing this indicator: inspection frequency, overdue inspections, initial inspections of new licenses, timely dispatch of inspection findings to licensees, and performance of reciprocity inspections. The review team's evaluation was based on the Bureau's questionnaire response relative to this indicator, data gathered from the Bureau's database, examination of completed inspection casework, and interviews with managers and staff.

The review team verified that the Bureau inspection priorities for various license types are at least as frequent as, and typically more frequent than, the inspection priorities for similar license types listed in IMC 2800. Since the last IMPEP review, the Bureau has maintained a computerized Environmental Facility Information System to review and track licensee inspection data. All inspection timeliness calculations are performed by the computer program. The Radioactive Materials Program Manager prints out reports for materials inspections that are coming due in the next 6 months. The printout identifies the last inspection date, the inspection due date, and the 25 percent overdue date, consistent with IMC 2800. The Bureau's maximum inspection interval is 5 years.

For medical facilities conducting activities subject to multiple priorities, all activities of the licensee are inspected according to the most restrictive priority. The Bureau uses this approach to simplify the inspection schedule, and to limit the impact of inspections on licensees.

In their response to the questionnaire, the Bureau indicated that there were no inspections currently overdue by more than 25 percent of the NRC frequency. In addition, the Bureau

revealed that approximately 150 Priority 1, 2, and 3 inspections were performed for the review period. The review team confirmed that there were no routine Priority 1, 2, and 3 inspections overdue at the time of the review and determined that only five Priority 1, 2, and 3 inspections were conducted overdue by more than 25 percent of the NRC frequency during the review period.

The Bureau requires that new licensees be inspected within 6 months of license issuance or within 6 months of the initial receipt of radioactive materials, but always within one year of license issuance. According to the questionnaire, 60 initial inspections were completed during the review period and were performed within the above criteria, which meets the requirements of IMC 2800. Based on a sample of initial inspection reports completed, none were overdue at the time of the review. The review team calculated that approximately 2.4 percent of the total Priority 1, 2, and 3 and initial inspections conducted by the Bureau during the review period were performed overdue.

The timeliness of the issuance of inspection findings was evaluated during the inspection casework review. The majority of the Bureau's routine inspections are documented with the issuance of a Form 591 Field Compliance Form at the completion of the on-site inspection. Other inspection findings are routinely dispatched to licensees within 30 days of completing an inspection.

The Bureau issues reciprocity permits based on their July 1 - June 30 fiscal year. During the review period, the Bureau had 45 reciprocity licensees that were candidates for inspection based upon the criteria in IMC 1220. The Bureau met and/or exceeded the NRC's criteria of inspecting 20 percent of candidate licensees operating under reciprocity in each of the 4 years of the review period.

The review team determined that with respect to Commission Staff Requirements Memorandum (SRM) for COMSECY-05-0028, on Increased Controls, the Bureau planned for the initial set of inspections of licensees subject to the Increased Controls in accordance with the SRM. The review team evaluated the Bureau's prioritization methodology and found it acceptable. The Bureau has 31 active Increased Controls licensees, 15 of which were identified as needing to be inspected within the first year. The Bureau has conducted and completed all 15 inspections of the first year inspections. The Bureau expects to complete the remaining IC inspections in the next 2 years.

Based on the IMPEP evaluation criteria, the review team recommends that South Carolina's performance with respect to the indicator, Status of Materials Inspections Program, be found satisfactory.

### 3.3 Technical Quality of Inspections

The review team evaluated the inspection reports, enforcement documentation, and inspection field notes and interviewed inspectors for 33 radioactive materials inspections conducted during the review period. The casework reviewed included inspections conducted by four Bureau inspectors and two managers. The casework covered inspections of various license types, including: medical broad scope, medical institutions requiring written directives, medical private practice, fixed and portable gauges, industrial radiography, academic broad scope, irradiator, medical therapy, nuclear pharmacy, Increased Controls, and reciprocity. Appendix C lists the

inspection casework files reviewed, with case-specific comments, as well as the results of the inspector accompaniments.

Based on the casework file reviews, the review team found that routine inspections covered all aspects of the licensees' radiation protection programs. Inspection reports were thorough, complete, consistent, and of high quality, with sufficient documentation to ensure acceptable performance with respect to health, safety, and security issues. Exit interviews were held with appropriate licensee personnel. Team inspections were performed when appropriate and for training purposes. Inspection reports are examined and signed by the Radioactive Materials Division Director.

South Carolina's inspection procedures are consistent with NRC's procedures. Bureau inspectors attempt to perform unannounced inspections; however, inspections may be announced a few days before the inspection to ensure the appropriate personnel are available during the inspection. The review team noted that 12 of 33 inspection files indicated that the inspections were unannounced during this review period, as compared to 6 of 28 inspection files during the previous review.

The Bureau emphasizes the performance of field audits for licensees authorized to conduct operations at temporary jobsites. One industrial radiography licensee has not had a field audit conducted since the license was issued on August 21, 1998. An unsuccessful attempt was made to arrange for a field audit during the August 16, 2006, inspection. This instance is similar to an occurrence identified during the previous review, in which a radiographer had not been inspected in the field for a period of 8 years. The 2003 review team recommended that NRC adopt and disseminate final guidance on field inspections for industrial radiography operations in the interest of establishing an identifiable national materials program standard. As noted in Section 2.0, the guidance has not yet been developed. The review team discussed with the Bureau the need to continue to place more emphasis on conducting field inspections for licensees authorized for use of licensed material at temporary jobsites pending the issuance of the final guidance.

During the review period, Bureau managers performed annual accompaniments of all individuals who performed radioactive materials inspections. The accompaniment reports contained sufficient details to document the areas covered.

The review team verified that the Bureau has an adequate supply of survey instruments to support the current inspection program. Appropriate, calibrated survey instrumentation, such as Geiger-Mueller survey meters, scintillation survey meters, ion chambers, and micro-R meters, were observed to be available. Most instruments are calibrated by the Department's Calibration Laboratory, which is a Certified Regional Calibration facility. Instrument repair and calibration is also available from the instrument manufacturers, as needed. Inspectors on call for incident response are issued an emergency kit which contains two calibrated survey instruments, tape, spare batteries, etc.

The Department's Environmental Laboratory and a contract laboratory provide support to the Bureau through radiological analyses of environmental samples and samples taken by inspectors during inspections, as well as environmental dosimetry around nuclear facilities.

Accompaniments of three radioactive materials program inspectors were conducted by a review team member during the week of May 7, 2007. The accompaniments are identified in Appendix C. During the accompaniments, the inspectors demonstrated appropriate inspection techniques, knowledge of the regulations. The inspectors were well-prepared and thorough in their reviews of the licensees' radiation safety and security programs. The inspections were adequate to assess radiological health and safety and Increased Controls at the licensed facilities.

Based on the IMPEP evaluation criteria, the review team recommends that South Carolina's performance with respect to the indicator, Technical Quality of Inspections, be found satisfactory.

### 3.4 Technical Quality of Licensing Actions

The review team examined completed licensing casework and interviewed license reviewers for 14 specific licenses issued by the Bureau. Licensing actions were reviewed for completeness, consistency, proper radioisotopes and quantities, qualifications of authorized users, adequate facilities and equipment, adherence to good health physics practices, financial assurance, operating and emergency procedures, appropriateness of license conditions, Increased Controls, and overall technical quality. The casework was also reviewed for timeliness, use of appropriate deficiency letters and cover letters, reference to appropriate regulations, product certifications, supporting documentation, consideration of enforcement history, pre-licensing visits, supervisory/peer review, and proper signatures. The casework was checked for retention of necessary documents and supporting data.

The licensing casework was selected to provide a representative sample of licensing actions completed during the review period. Licensing actions selected for evaluation included three new licenses, three renewals, six amendments, one termination, and one reciprocity request. The sampling included the following license types: medical (broad-scope, gamma knife, high dose-rate remote afterloader and private practice), manufacturing and distribution, irradiator, industrial radiography, portable gauge, fixed gauge, academic, research and development, and nuclear pharmacy. A listing of the licensing casework evaluated, with case-specific comments, may be found in Appendix D.

The review team found that the licensing actions were thorough, complete, consistent, and of high quality, with health, safety, and security issues properly addressed. License tie-down conditions were stated clearly, backed by information contained in the file, and auditable. Licenses and correspondence were generated using standardized conditions and formats. Licensing staff appropriately used licensing guides, policies, and standard license conditions.

The review team noted that licensees' compliance histories were taken into account when reviewing renewal applications. Each licensing action was given a technical review by a license evaluator. Senior management performed a technical and supervisory review on each licensing action before the license or amendment was issued. During the review period, the Bureau extended the standard license expiration date from 5 to 8 years from date of issue. The review team did not note any timely license renewals pending for a period of greater than one year.

The review team evaluated financial assurance and decommissioning activities. The review team found that the terminated licensing action reviewed was well-documented, showing appropriate radioactive material transfer and survey records. The review team noted that a site visit was performed and confirmatory surveys were conducted, prior to termination of the license.

The review team identified no performance issues with the handling of financial assurance or decommissioning.

The review team examined the list of licensees that the Bureau had determined met the criteria for the Increased Controls, per COMSECY-05-0028. The review team determined that the Bureau correctly identified the licensees that require the Increased Controls based on this criteria. The Bureau will issue the Increased Controls to any additional licensees, as appropriate. Each licensee was issued a license amendment requiring the Increased Controls in accordance with the time lines established by the Commission in the SRM for COMSECY-05-0028.

The review team examined licenses subject to pre-licensing guidance described by FSME 07-026 dated March 20, 2007, *Evaluation of the Implementation of the Pre-licensing Guidance During Integrated Materials Performance Evaluation Program (IMPEP) Reviews*. The Bureau had implemented the pre-licensing guidance by the time of the review, well in advance of the September 20, 2007, due date for Agreement States to implement the pre-licensing guidance. The review team noted that as of the end of the review period, the Bureau had resumed hand-delivering new licenses.

Based on the IMPEP evaluation criteria, the review team recommends that South Carolina's performance with respect to the indicator, Technical Quality of Licensing Actions, be found satisfactory.

### 3.5 Technical Quality of Incident and Allegation Activities

To evaluate the effectiveness of the Bureau's actions in responding to incidents and allegations, the review team examined the Bureau's response to the questionnaire relative to this indicator, evaluated selected incidents reported for South Carolina in the Nuclear Material Events Database (NMED) against those contained in the Bureau's files, and evaluated the case work for 18 radioactive materials incidents. A listing of the incident casework examined, with case-specific comments, may be found in Appendix E. The review team also evaluated the Bureau's response to two allegations, one of which was referred to the State by the NRC during the review period.

The review team discussed the Bureau's incident and allegation processes including file documentation, notification of incidents to the NRC Headquarters Operations Center, and the use of NMED software. When a notification of an incident or allegation is received, managers and staff discuss the event and determine the level of initial response based on the health and safety risk associated with the event. The actions taken in response to an event are documented and filed, and the data are processed into NMED. The Bureau's understanding and use of the NMED system was verified by a demonstration of a data search and generation of specific reports.

The Bureau had 40 events documented in their Incident and Allegation Log. The review team selected 18 radioactive material incidents for evaluation. These incidents included medical events, lost/stolen material, an overexposure, and equipment malfunctions. The Bureau's responses to the incidents were complete and comprehensive. Initial responses were prompt and well-coordinated, and the level of effort was commensurate with the health and safety

significance. Inspectors were dispatched for on-site investigations when appropriate. Enforcement and/or other regulatory actions were taken as appropriate.

The review team noted several incidents documented in NMED referring to alarms at scrap yards and steel mills. These incidents originated from States outside of South Carolina, and the material was returned to those States.

In evaluating the effectiveness of Bureau's actions responding to allegations, the review team evaluated the casework for one allegation referred to the Bureau by the NRC and one received directly by the Bureau. The casework review indicated that the Bureau took prompt and appropriate action in response to the concerns raised. The allegations were appropriately closed, and the appropriate parties were notified of the actions taken.

Based on the IMPEP evaluation criteria, the review team recommends that South Carolina's performance with respect to the indicator, Technical Quality of Incident and Allegation Activities, be found satisfactory.

#### 4.0 NON-COMMON PERFORMANCE INDICATORS

IMPEP identifies four non-common performance indicators to be used in the evaluation of Agreement State programs: (1) Compatibility Requirements; (2) Sealed Source and Device Evaluation Program; (3) Low-Level Radioactive Waste Disposal Program; and (4) Uranium Recovery Program. South Carolina's Agreement does not cover uranium recovery activities, so only the first three non-common performance indicators were applicable to this review.

##### 4.1 Compatibility Requirements

###### 4.1.1 Legislation

South Carolina became an Agreement State in 1969. In addition to its response to the questionnaire, the State provided the review team with a copy of the legislation that affects the radiation control program. There have been no changes since the last review. The radiation control program's statutory authority is contained in the 1976 Code of Laws of South Carolina, the Atomic Energy and Radiation Control Act, the Radioactive Waste and Transportation Act, and Environmental Fees. The Department is designated the State's radiation control program agency and implements the Agreement State program. South Carolina legislation is not subject to any "sunset" laws.

###### 4.1.2 Program Elements Required for Compatibility

The Department's Radioactive Materials Regulations 61-63, Title A, apply to all materials that emit ionizing radiation. These regulations were promulgated pursuant to Section 13-7-40 et. seq. of the 1976 South Carolina Code (as amended) and The Atomic Energy and Radiation Control Act. South Carolina requires a license for possession and use of all radioactive material including naturally occurring materials, such as radium, and accelerator produced radionuclides. South Carolina also requires registration of all equipment designed to produce x-rays or other ionizing radiation and tanning beds.

The review team examined South Carolina's rulemaking process and found that rulemaking takes approximately 6 to 9 months from the development stage to the publication of the final rule in the State Register. Rules become effective 14 days after the final filing process is completed. The public, the NRC, other agencies, and all potentially impacted licensees and registrants are offered opportunity to comment during the process. Comments are considered and incorporated, as appropriate, before regulations are finalized, approved, and published in the *State Register*. South Carolina can adopt regulations needed for compatibility with approval from the Department Board (the Board); whereas, other regulations, such for fees, must receive approval from the State legislature.

The State is authorized to adopt other agency regulations by reference, which has been done with respect to transportation regulations adopted by the U.S. Department of Transportation. The State also has the authority to issue legally binding requirements (e.g., license conditions, etc.) until compatible regulations become effective.

The review team evaluated the State's responses to the questionnaire relative to this indicator, reviewed the status of regulations required to be adopted by the State under the Commission's adequacy and compatibility policy, and verified the adoption of regulations with data obtained from the Office of Federal and State Materials and Environmental Management Programs's State Regulation Status Sheet.

Current NRC policy requires that Agreement States adopt certain equivalent regulations or legally binding requirements no later than 3 years after they become effective. At the time of the review there were no overdue NRC regulation amendments. Also, at the time of the review, the review team did not identify any regulation amendments for future adoption that have not already been addressed by the State.

Based on the IMPEP evaluation criteria, the review team recommends that South Carolina's performance with respect to the indicator, Compatibility Requirements, be found satisfactory.

#### 4.2 Sealed Source and Device (SS&D) Evaluation Program

The Bureau has sole responsibility for performing SS&D evaluations in the State. In conducting this review, three sub-elements were used to evaluate the Bureau's performance regarding the SS&D Evaluation Program. The three sub-elements are: (1) Technical Staffing and Training; (2) Technical Quality of the Product Evaluation Program; and (3) Evaluation of Defects and Incidents Regarding SS&Ds.

In assessing the Bureau's SS&D evaluation activities, the review team examined information provided by the Bureau in response to the IMPEP questionnaire on this indicator, performed a search of the national Sealed Source and Device Registry for registrations issued by South Carolina, and performed NMED searches of manufacturers and distributors identified on SS&D registrations issued by South Carolina. A review of all SS&D evaluations completed during the review period was conducted.

##### 4.2.1 Technical Staffing and Training

The Bureau has one qualified SS&D reviewer with full signature authority and obtained the assistance of another qualified SS&D reviewer from NRC to complete the one new SS&D

registration during the review period. The Bureau's qualified reviewer has over 20 years of experience with the Bureau, has a Bachelor's degree in a science, and has attended the NRC SS&D workshop. The single new SS&D registration completed was the only SS&D action issued by the State during the review period. At the time of the review, the Bureau did not have any pending SS&D evaluations and did not expect any forthcoming SS&D applications.

The Bureau has another staff member who attended the NRC's SS&D workshop in April of 2006; however, the staff member was not evaluated by the Bureau to have other training and experience necessary to perform SS&D evaluations. Prior to the on-site review, the Bureau did not have documented qualification criteria for SS&D Reviewers. During the on-site review, the Bureau developed and documented qualification criteria for SS&D Reviewers. The documented qualification criteria was added to the Bureau's training procedure manual. The Bureau indicated that other staff members may undergo training to become SS&D reviewers in the future.

Because of the very light present and future workloads for SS&D evaluations and the availability of a second qualified SS&D reviewer from outside of the Bureau, the review team determined that the Bureau's retention of one qualified SS&D reviewer was adequate.

#### 4.2.2 Technical Quality of the Product Evaluation Program

During the review period, the Bureau processed one SS&D action. The action was for a new SS&D registration of a device. The casework review included all supporting documentation, license, and inspections associated with the distributor of the device. A listing of the SS&D registration evaluated by the review team, with case-specific comments, may be found in Appendix F.

Analysis of the casework and interviews with the staff confirmed that the Bureau follows the recommended guidance from the NRC SS&D training workshops and NUREG-1556, Volume 3, Revision 1. Appropriate review checklists were used to assure all relevant materials had been submitted and reviewed. The checklists were retained in the SS&D files along with other documents that identified the reviewers. Pertinent American National Standards Institute standards, Regulatory Guides, and applicable references were confirmed to be available and were used when performing the SS&D review.

The registration files contained all correspondence, engineering drawings, radiation profiles, and details of the applicant's quality assurance and quality control program, with exception that one of the documents referenced in the registration, letter dated February 13, 2007, was initially missing from the file. The missing document was determined to be identical to another letter dated January 18, 2007, that was in the file except that the document had a different date on the letter and was addressed to the NRC instead of the Bureau. The Bureau obtained a copy of the referenced letter dated February 13, 2007, from the NRC and completed the file. The registration clearly summarized the product evaluation to provide license reviewers with adequate information to license the possession and use of the product. Deficiency letters clearly stated regulatory positions and all health and safety issues were properly addressed. The review team found that the evaluation was of high quality with health and safety issues properly addressed. The Bureau is legally authorized to enforce the requirements of SS&D registrations through regulations issued by the Department.

#### 4.2.3 Evaluation of Defects and Incidents Regarding SS&Ds

Based upon the Bureau's response to the questionnaire, interview of the Bureau's management, and the review team's searches of NMED, there were no reports of any defects or incidents during the review period related to SS&D registrations issued by the Bureau.

Based on the IMPEP evaluation criteria, the review team recommends that South Carolina's performance with respect to the indicator, SS&D Evaluation Program, be found satisfactory.

#### 4.3 Low-Level Radioactive Waste (LLRW) Disposal Program

Chem-Nuclear Systems, LLC, (Chem-Nuclear) is licensed by the Division to handle, process, store, and dispose of LLRW at the Barnwell site. EnergySolutions, LLC, acquired Chem-Nuclear in 2006, but did not effect a name change for the Barnwell operator. The Division is responsible for inspection, licensing, and response to incidents and allegations at the 14 waste-related materials licensees, in addition to the Barnwell site.

The LLRW license establishes regulatory conditions and procedures that Chem-Nuclear must comply with regarding waste acceptance criteria, site construction, maintenance, environmental monitoring, stabilization and closure. Chem-Nuclear began its operation of shallow land disposal of LLRW at Barnwell in 1971. Since the last review, the license was amended twice to include conditions on ownership name change (Amendment 48) and to impose the Increased Controls (Amendment 50).

The current license expired in July 2000 and is currently in timely renewal. Under timely renewal, Chem-Nuclear may continue to operate the facility under the existing license and regulations until the Division takes final action on the application for renewal. The application for renewal was submitted on April 27, 2000. In response to the recommendations provided by the Division, Chem-Nuclear submitted an Environmental Radiological Performance Verification (ERPV) report to demonstrate the performance of the site after closure. The Division formed a Blue Ribbon Panel (the Panel) of experts to provide a third-party, independent review of the ERPV report. The ERPV report was reviewed by the Panel as part of the renewal package. In 2003, Chem-Nuclear revised the ERPV report to address the Panel's recommendations.

The proposed license renewal went through a public hearing in 2003. On March 15, 2004, the Division approved the license renewal (Amendment 49). The license renewal was challenged by environmental stakeholders. In 2005, the South Carolina Administrative Law Court (the Court) issued a final order which sustained the Division's approval of the license renewal. In 2006, the stakeholders appealed the Court's decision to the Board. The Board upheld the Court's decision. In 2007, the Board's decision was appealed to and heard by South Carolina Supreme Court to determine where the case will be sent. The South Carolina Supreme Court's decision is pending.

The Division monitors the maximum radioactivity limits, mass, and volume of each waste shipment and the total annual waste inventory at the facility. Under the restrictions of the Atlantic Compact, the amount of waste allowed to be received by the Barnwell site has reduced and will continue to reduce over the years. Barnwell received 71,416 cubic feet in 2003; 57,242 cubic feet in 2004; 42,785 cubic feet in 2005; and 38,466 cubic feet in 2006. As of May 31, Barnwell received 12,736 for 2007. Since 1971, Barnwell has received 28,047,035 cubic feet of waste.

The review team noted that site monitoring data continues to show on- and off-site groundwater tritium contamination. A tritium plume has migrated off-site, but remains within the property owned and controlled by EnergySolutions, LLC. The high level of tritium was first detected in an on-site monitor well in 1974. The enhancement of the final covers over the older disposal trenches appears to be effective as the on-site tritium concentrations are decreasing. The tritium level in groundwater collected from on- and off-site monitor wells exceeds the effluent concentration release limit specified in Department's regulations; however, the Division estimates that doses from such releases are less than allowable dose limits of 25 millirem per year under Department regulations. The Division's action level is 13 millirem per year.

EnergySolutions, LLC, is required to provide temporal trends in groundwater concentrations at selected wells on an annual basis. The new requirement for trending data will enhance the Division's ability to evaluate this issue. EnergySolutions, LLC, has been submitting an annual trending data report on tritium to the Division since fall of 2003.

#### 4.3.1 Technical Staffing and Training

The Division currently has six full-time technical staff (a reduction of one staff member since the last review). Four staff members (the Division's Assistant Director, the Radioactive Waste Management Section Manager, the Radioactive Waste Management Consultant, and a part time Radioactive Waste Management Environmental Engineer) left the program during the review period. The Assistant Director and the Consultant (a retired annuitant) retired, and the Section Manager left government service. The Division re-hired the Environmental Engineer as the full time Section Manager. All staff members have, at least, Bachelor's degrees or equivalent training and experience. Training procedures are outlined in the Division's Standard Operating Procedures. The Division also maintains a Training Database for each staff member. The Training Database was not up-to-date at the time of the review. The review team discussed the benefits of maintaining an up-to-date record of staff's training with Division managers.

Staff training is adequate and comparable to IMC 1246. Two staff members attended the Inspection Procedures Course in 2004. Three staff members attended the NRC's Materials Control and Security Course in 2006. Division staff are very familiar with the regulations, policies, and procedures.

The review team interviewed each of the staff members to discuss inspection procedures, inspection reports, and their technical backgrounds. The review team determined that the Division has an adequate level of well-trained, experienced, and professional staff.

#### 4.3.2 Status of Low-Level Radioactive Waste Disposal Inspection

The review team examined the status of the Barnwell site inspections. The Division performs inspections in accordance with the *Radioactive Material Licensing and Compliance Administrative Procedures Manual*. This manual did not include time frames for report completion or for sending the inspection findings to the licensee. Inspections were conducted unannounced. The review team found that the Division's site inspector conducts routine vehicle and shipment inspections and surveys, performs visual inspection of the vehicle for package integrity, observes preparation of shipments prior to disposal, and splits groundwater samples from on-site and off-site monitor wells with EnergySolutions, LLC, on a quarterly basis. The

review team also noted that Division health physicists perform weekly inspections and semi-annual inspections include Division managers, health physicists, and environmental engineers.

The Division has changed the inspection frequency at the Barnwell site from annual to semi-annual. The review team confirmed the frequency of inspections through review of the site inspector logbook, and weekly and semi-annual inspection reports. In addition, the Division inspected five other licenses related to the Barnwell site operations during the review period. The frequency of inspections exceeded the inspection frequency requirement specified in IMC 2800. The Division's maximum inspection interval is 3 years. The review team confirmed that there were no routine inspections overdue at the time of the review.

The review team evaluated the timeliness of the issuance of inspection findings during the inspection casework review. For 19 routine inspection files examined, completion dates for six of the inspection reports ranged from 2 to 6 months after the inspection; therefore, the inspection finding letters for these inspections were not sent to the licensee within 30 days. For all other inspection files reviewed, the Division communicated inspection findings, including recommendations, to the licensee within 30 days.

#### 4.3.3 Technical Quality of Inspections

Nineteen inspection reports, as well as the site inspector logbook, were examined by the review team. Division inspections were thorough and complete. Inspectors performed independent surveys and analyses during their inspections. The Division uses digital imaging to document site and shipment conditions during their inspections.

Beginning in May 2004, the Division implemented a checklist-fashion inspection report. The Division maintains copies of all inspections reports. Depending on the outcome of the inspection, either a Form 591 (compliance form that may include recommendations) or a Form 592 (Notice of Violation) will be completed and sent to the licensee. During the review period, the Division did not issued any Form 592. Inspection findings, licensee's responses, and closure of inspection issues were generally well-documented. Copies fo the inspection reports maintained in the Division's files were not always signed by the inspector; however, the inspectors name was printed on the form.

Several of the inspection finding letters were transmitted to the licensee prior to the Division managers' review. Inspection findings were typically discussed with the Division managers after the inspection. Once the manager concurred with the findings, the letter was sent out. Usually letters were sent out on the same day the report was completed.

The site inspector maintains a log of each waste shipment received by the Barnwell site. The review team examined the waste shipment records and found them to be complete.

The review team confirmed that the Division has an adequate supply of radiation detection instruments to support the current inspection program. Appropriate, calibrated survey instrumentation such as portable germanium detector, portable smear counter, Geiger-Mueller survey meters, scintillation survey meters, ion chambers, and micro-R meters were available.

The review team examined the Division's program to monitor the Barnwell site's condition during operations. The Division reviews characterization of disposal trenches, including depth of the

water table. Staff documented trench construction to ensure structural stability and took action regarding any deviations from the approved designs. The site inspector kept detailed and complete records of waste shipments, type, originator, volume, and activity. The site inspector maintained an adequate supply of radiation detection instruments on site.

In addition to the review of information and interviews with the Division's staff and management during the on-site portion of the review, a two-day visit to the Barnwell site was conducted on July 12-13, 2007. At the site, the Division's on-site inspector was interviewed, facility operations and overall site conditions were examined, and another Division inspector was accompanied on the weekly site inspection. Both inspectors were very knowledgeable of the operations at the site and provided a thorough explanation of the site background, site description, storage facilities, and current activities including environmental monitoring by EnergySolutions, LLC, and the Division staff at the Barnwell site.

The Radiation and Environmental Monitoring laboratory was visited on July 13, 2007. The Division oversees the laboratory. The laboratory was well-maintained, as well as being equipped with adequate radiological instrumentation for sample analyses. The laboratory technical staff involved with the site are health physicists, who have been trained in radiochemistry, environmental sampling and analysis, and data evaluation. Results of environmental monitoring are maintained at the laboratory.

#### 4.3.4 Technical Quality of Licensing Actions

The review team evaluated two licensing actions on the waste site license, and 14 actions on other Division licenses completed during the review period. The Division maintains complete records regarding licenses, amendments, and renewals. The review team noted that the Division has adequate internal licensing guides and general licensing procedures. Overall, the review team found that the Division's licensing actions were thorough, complete, and adequate to address health, safety, and security issues.

A Ninety Days' Notice is sent to the licensee prior to the license expiration date. Licenses are renewed on a 5-year frequency. All new licenses and most amended licenses are hand-delivered to the licensee by Division staff. Each licensing action is reviewed by one individual and then discussed with Division managers prior to issuance. Division managers sign new, amended, and renewed licenses prior to submittal to the licensees. The Division staff follow their licensing guides, including checklists/worksheets, during the review process to ensure that licensees submit the information necessary to support their request. The licensee's compliance history is taken into account when reviewing renewal applications. Deficiencies are addressed by letters and documented telephone conferences.

For two amendments, the license or amendment copy in the file was not signed by Division managers. Signed copies of the amended licenses were transmitted to the licensee; however, the copies were added to the Division's files prior to Division managers' signatures. The review team discussed with the Division the benefit of making photocopies of signed licenses prior to transmitting to licensees to ensure that a signed copy is maintained in the Division's files.

The review team examined documentation of interactions with the licensee to ensure proper and clear communication of license conditions and regulatory requirements. The review team

discovered that the Division's files contain complete and timely documentation of interactions with the licensee and clear regulatory requirements.

Prior notification is made to the Division by the licensee before a waste shipment leaves the originator. The Division reviews the "Radioactive Waste Prior Notification and Manifest Forms," before authorizing the shipment of the waste. This review is done to ensure that waste characteristics and classifications are adequately determined and documented in accordance with license conditions. Waste originators go through a comprehensive analysis to demonstrate that radioactive waste complies with the requirements. The Division has procedures and license conditions to ensure that the site licensee does not accept radioactive waste for storage or disposal unless the shipper has completed the required information for the waste shipment on the NRC's LLRW Manifest Forms 540 "Shipping Papers," 541 "Container and Waste Description," and 542 "Manifest Index and Regional Compact Tabulation," as applicable, or approved equivalent forms.

The Division may grant variances under certain circumstances for waste type, waste class, activity, and volume. The licensee must make prior written notifications to the Division for variances. Approval of variances are part of the license condition. The review team evaluated one of the requested variances, which was denied by the Division. The review team found that the Division's technical basis for denial was thorough and well-documented.

#### 4.3.5 Technical Quality of Incident and Allegation Activities

Management of allegations and confidential sources are performed in accordance with the Division's internal procedures. This guidance did not specifically include procedures for reporting incidents to NMED; however, in case of an incident related to the Division's licenses, the Division's inspectors conduct the investigation and coordinate with the Bureau for entering the data into NMED. There were no incidents or allegations since the last review.

The review team evaluated the casework for one concern referred to the Division by the NRC. The review team concluded that the Division took prompt and appropriate action in response to the concern. The concern was appropriately investigated, and the appropriate parties were notified of the results.

Based on the IMPEP evaluation criteria, the review team recommends that South Carolina's performance with respect to the indicator, Low-Level Radioactive Waste (LLRW) Disposal Program, be found satisfactory.

## 5.0 SUMMARY

As noted in Sections 3.0 and 4.0, the review team found South Carolina's performance to be satisfactory for all performance indicators reviewed. The review team made no recommendations regarding the performance of the South Carolina Agreement State Program. Accordingly, the review team recommends that the South Carolina Agreement State Program be found adequate to protect public health and safety and compatible with NRC's program. Based on the results of the current IMPEP review, the review team recommends that the next full IMPEP review take place in approximately 4 years.

The 2003 review team made two recommendations to NRC. This review team recommends that those specific recommendations remain open. In addition, the review team recommends that the NRC strengthen its system for tracking recommendations to NRC by IMPEP teams. (Section 2.0)

## LIST OF APPENDIXES

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## APPENDIX A

### IMPEP REVIEW TEAM MEMBERS

<b>Name</b>	<b>Area of Responsibility</b>
Richard Blanton, FSME	Team Leader Technical Staffing and Training
Sam Mulay, RIII	Status of Materials Inspection Program Technical Quality of Inspections Inspector Accompaniments
Joshua Daehler, MA	Technical Quality of Licensing Actions Sealed Source and Device Evaluation Program
James Kottan, RI	Technical Quality of Incident and Allegation Activities
Monica Orendi, FSME	Compatibility Requirements
Muhammadali Abbaszadeh, TX	Low-Level Radioactive Waste Disposal Program Inspector Accompaniments

APPENDIX B

SOUTH CAROLINA ORGANIZATION CHARTS

ADAMS ACCESSION NOS.:

ML072330462, Pgs. 11-13

ML072330465, Pg. 10

APPENDIX C

INSPECTION CASEWORK REVIEWS

NOTE: CASEWORK LISTED WITHOUT COMMENT ARE INCLUDED FOR COMPLETENESS ONLY.

SOUTH CAROLINA BUREAU OF RADIOLOGICAL HEALTH

File No.: 1		
Licensee: Palmetto Richland Memorial Hospital		License No.: 40
Inspection Type: Routine, Announced		Priority: 2
Inspection Date: 5/8/07		Inspector: AR
File No.: 2		
Licensee: Palmetto Richland Memorial Hospital		License No.: 40
Inspection Type: Increased Controls, Announced		Priority: 1
Inspection Date: 5/31/07		Inspector: JP
File No.: 3		
Licensee: East Cooper Regional Medical Center		License No.: 381
Inspection Type: Routine, Unannounced		Priority: 3
Inspection Date: 11/19/03		Inspector: MB
File No.: 4		
Licensee: Care Alliance		License No.: 646
Inspection Type: Routine, Announced		Priority: 2
Inspection Date: 11/21/03		Inspector: AR
File No.: 5		
Licensee: GHS Hillcrest Hospital		License No.: 400
Inspection Type: Routine, Announced		Priority: 3
Inspection Date: 1/6/05		Inspector: JH
File No.: 6		
Licensee: Aiken Regional Medical Centers		License No.: 233
Inspection Type: Routine, Unannounced		Priority: 3
Inspection Date: 6/16/05		Inspector: AR
File No.: 7		
Licensee: Applied Technical Services		License No.: 410
Inspection Type: Routine, Announced		Priority: 1
Inspection Date: 5/9/07		Inspector: LC
File No.: 8		
Licensee: Applied Technology Services, Inc.		License No.: 410
Inspection Type: Increased Controls, Announced		Priority: 1
Inspection Date: 12/13/06		Inspector: MW

File No.: 9

Licensee: Weld-Spect Technologies & Testing, Ltd., Co.  
Inspection Type: Routine, Unannounced  
Inspection Date: 3/17/07

License No.: 731  
Priority: 1  
Inspector: AR

File No.: 10

Licensee: Weld-Spect Technologies & Testing, Ltd., Co.  
Inspection Type: Increased Controls, Announced  
Inspection Date: 3/17/07

License No.: 731  
Priority: 1  
Inspector: AR

File No.: 11

Licensee: Acuren Inspection, Inc.  
Inspection Type: Routine, Unannounced  
Inspection Date: 8/16/06

License No.: 595  
Priority: 1  
Inspector: AR

Comment:

A field inspection has not been performed since August 21, 1998, when the licence was initially issued; however, a good faith attempt was made to coordinate with the licensee to perform a field review as part of the August 16, 2006, inspection.

File No.: 12

Licensee: Acuren Inspection, Inc.  
Inspection Type: Increased Controls, Announced  
Inspection Date: 12/14/06

License No.: 595  
Priority: 1  
Inspector: AR

File No.: 13

Licensee: Jacobs Applied Technology, Inc.  
Inspection Type: Routine, Announced  
Inspection Date: 2/21/07

License No.: 205  
Priority: 2  
Inspector: LC

Comments:

- a) Inspection report did not indicate if visual/audible alarms were verified as operational during the inspection.
- b) Inspection report did not indicate if individual radiographers were interviewed.

File No.: 14

Licensee: Jacobs Applied Technology, Inc.  
Inspection Type: Increased Controls, Announced  
Inspection Date: 5/8/07

License No.: 205  
Priority: 2  
Inspector: MW

File No.: 15

Licensee: Pee Dee Isotopes, Inc.  
Inspection Type: Routine, Unannounced  
Inspection Date: 1/11/06

License No.: 599  
Priority: 2  
Inspector: MB

File No.: 16

Licensee: General Engineering & Environmental, LLC.  
Inspection Type: Routine, Announced  
Inspection Date: 4/22/05

License No.: 601  
Priority: 5  
Inspector: MW

File No.: 17

Licensee: Medical University of South Carolina  
Inspection Type: Routine, Announced  
Inspection Dates: 5/15-16/07

License No.: 081  
Priority: 2  
Inspectors: AR, MW, LC

File No.: 18

Licensee: Medical University of South Carolina  
Inspection Type: Increased Controls, Announced  
Inspection Date: 5/15/07

License No.: 081  
Priority: 2  
Inspector: AR

File No.: 19

Licensee: P.E.T. Net Solutions, Inc.  
Inspection Type: Routine, Unannounced  
Inspection Date: 11/15/06

License No.: 733  
Priority: 2  
Inspector: MB

File No.: 20

Licensee: Low Country Diagnostics, Inc.  
Inspection Type: Routine  
Inspection Date: 5/17/07

License No.: 521  
Priority: 2  
Inspector: MB

Comment:

Final written inspection report not completed. Inspector indicated the report will be completed by 07/31/07. Inspection findings were conveyed to the licensee the day of inspection.

File No.: 21

Licensee: Kershaw County Medical Center  
Inspection Type: Routine, Unannounced  
Inspection Date: 6/19/03

License No.: 176  
Priority: 5  
Inspector: JH

File No.: 22

Licensee: Penn Tech Diagnostics, Inc.  
Inspection Type: Routine, Announced  
Inspection Date: 3/18/04

License No.: 538  
Priority: 3  
Inspector: JH

Comment:

Inspection report not signed by management.

File No.: 23

Licensee: Geo-Systems Design & Testing, Inc.  
Inspection Type: Routine, Announced  
Inspection Date: 8/4/05

License No.: 421  
Priority: 5  
Inspectors: AR, LC

File No.: 24

Licensee: Keowee Primary Care & Internal Medicine, PC  
Inspection Type: Initial, Announced  
Inspection Date: 1/22/07

License No.: 818  
Priority: 5  
Inspector: MW

File No.: 25

Licensee: GS2 Engineering & Environmental Consultants, Inc.  
Inspection Type: Routine, Unannounced  
Inspection Date: 1/25/07

License No.: 796  
Priority: 5  
Inspectors: LC, KW

File No.: 26

Licensee: Mukesh Gandhi, M.D., PA  
Inspection Type: Initial, Unannounced  
Inspection Date: 4/02/07

License No.: 829  
Priority: 5  
Inspectors: MW, KW

Comment:

State licensee print-out lists the licensee as Priority 8.

File No.: 27

Licensee: Froehling & Robertson  
Inspection Type: Routine, Unannounced  
Inspection Date: 4/19/07

License No.: 170  
Priority: 5  
Inspector: KW

File No.: 28

Licensee: Palmetto Primary Care Physicians  
Inspection Type: Initial, Unannounced  
Inspection Date: 11/9/06

License No.: 814  
Priority: 5  
Inspector: MW

File No.: 29

Licensee: Bausch & Lomb Greenville Solutions Facility  
Inspection Type: Routine, Announced  
Inspection Date: 2/17/05

License No.: 431  
Priority: 2  
Inspector: DK

File No.: 30

Licensee: REVISS Services, Inc.  
Inspection Type: Reciprocity, Announced  
Inspection Date: 4/17/07

License No.: IL-02058-01  
Priority: 1  
Inspector: MW

File No.: 31

Licensee: S&ME, Inc.  
Inspection Type: Reciprocity, Announced  
Inspection Date: 5/16/06

License No.: 092-0922-1  
Priority: 1  
Inspector: MW

File No.: 32

Licensee: Nucletron Corporation  
Inspection Type: Reciprocity, Unannounced  
Inspection Date: 2/2/07

License No.: MD-27-035-01  
Priority: 2  
Inspector: AR

File No.: 33

Licensee: H&H X-Ray Services, Inc.  
Inspection Type: Reciprocity, Announced  
Inspection Date: 5/5/05

License No.: LA-2970-L01  
Priority: 1  
Inspector: MW

SOUTH CAROLINA DIVISION OF RADIOACTIVE WASTE MANAGEMENT

File No.: 34

Licensee: Chem Nuclear Systems, LLC  
Inspection Type: Routine, Unannounced  
Inspection Dates: 8/4-8/03

License No.: 097  
Priority: 1  
Lead Inspector: JS

Comments:

- a) Inspection report was completed approximately 3 months after the completion of the inspection.
- b) Inspection report and Form 591 were not signed by the lead inspector.
- c) Inspection letter, without violation, not issued until November 24, 2003.

File No.: 35

Licensee: Chem Nuclear Systems, LLC  
Inspection Type: Routine, Unannounced  
Inspection Dates: 4/5-9/04

License No.: 097  
Priority: 1  
Lead Inspector: JS

Comment:

Inspection report and Form 591 were not signed by the lead inspector.

File No.: 36

Licensee: Chem Nuclear Systems, LLC  
Inspection Type: Routine, Unannounced  
Inspection Dates: 11/15-18/04

License No.: 097  
Priority: 1  
Lead Inspector: JS

Comment:

Inspection report was not signed by the lead inspector; however, Form 591 was signed by the lead inspector.

File No.: 37

Licensee: Chem Nuclear Systems, LLC  
Inspection Type: Routine, Unannounced  
Inspection Dates: 4/18-22/05

License No.: 097  
Priority: 1  
Lead Inspector: JS

Comments:

- a) Inspection report was completed approximately 2 months after the completion of the inspection
- b) Inspection report and Form 591 were not signed by the lead inspector
- c) Inspection letter, without violation, was not issued until June 27, 2005.

File No.: 38

Licensee: Chem Nuclear Systems, LLC  
Inspection Type: Routine, Unannounced  
Inspection Dates: 10/24-27/05

License No.: 097  
Priority: 1  
Lead Inspector: JS

Comment:

Inspection report was not signed by the lead inspector; however, Form 591 was signed by the lead inspector.

File No.: 39

Licensee: Chem Nuclear Systems, LLC  
Inspection Type: Routine, Unannounced  
Inspection Dates: 5/15-19/06

License No.: 097  
Priority: 1  
Lead Inspector: JS

Comment:

Inspection report was not signed by the lead inspector; however, Form 591 was signed by the lead inspector.

File No.: 40

Licensee: Chem Nuclear Systems, LLC  
Type: Routine, Unannounced  
Inspection Dates: 1/22-25/07

License No.: 097  
Priority: 1  
Lead Inspector: JS

Comment:

- a) Inspection report was not signed by the lead inspector
- b) Inspection letter, without violation, was not issued until March 21, 2007.
- c) Inspection report was signed off as reviewed by management, but not dated.

File No.: 41

Licensee: Chem Nuclear Systems, LLC  
Type: Routine, Unannounced  
Inspection Date: 11/20/03

License No.: 287-01  
Priority: 2  
Inspector: MG

Comment:

- a) Inspection report was completed approximately 4 months after the completion of the inspection
- b) Inspection report and Form 591 were not signed by the inspector.
- c) Inspection letter, without violation, was not issued until March 31, 2004.

File No.: 42

Licensee: Chem Nuclear Systems, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 11/22/05

License No.: 287-01  
Priority: 2  
Inspector: MY

Comment:

Inspection report and Form 591 were not signed by the inspector.

File No.: 43

Licensee: Energy Solution, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 2/11/03

License No.: 287-02  
Priority: 2  
Inspector: MY

Comment:

- a) Inspection report was completed approximately 6 months after the completion of the inspection.
- b) Inspection report and Form 591 were not signed by the inspector.
- c) Inspection letter, without violation, was not issued until September 3, 2003.

File No.: 44

Licensee: Energy Solution, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 3/23/04

License No.: 287-02  
Priority: 2  
Inspector: MY

Comment:

Inspection report and Form 591 were not signed by the inspector.

File No.: 45

Licensee: Energy Solution, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 11/22/05

License No.: 287-02  
Priority: 2  
Inspector: MP

Comment:

Inspection report and Form 591 were not signed by the inspector.

File No.: 46

Licensee: Energy Solution, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 5/16/07

License No.: 287-02  
Priority: 2  
Inspector: MP

Comments:

- a) Inspection report was signed off as reviewed by management, but not dated.
- b) Inspection report and Form 591 were not signed by the inspector.

File No.: 47

Licensee: Chem Nuclear, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 6/4/03

License No.: 287-03  
Priority: 2  
Inspector: MG

Comments:

- a) Inspection report was completed approximately 4 months after the completion of the inspection.
- b) Inspection report was not signed by the inspector.
- c) Inspection letter, without violation, was not issued until October 20, 2003.

File No.: 48

Licensee: Chem Nuclear, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 8/16/05

License No.: 287-03  
Priority: 2  
Inspector: MP

Comment:

Inspection report and Form 591 were not signed by the inspector.

File No.: 49

Licensee: Energy Solution, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 4/17/06

License No.: 287-04  
Priority: 1  
Inspector: JS

Comment:

Inspection report was reviewed by two managers. Inspection report was signed, but not dated, by one of the managers and neither signed nor dated by the other.

File No.: 50

Licensee: Energy Solution, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 2/12/07

License No.: 287-04  
Priority: 1  
Inspector: JS

Comments:

- a) Inspection report was signed off as reviewed by management, but not dated.
- b) Inspection report was not signed by the lead inspector; however, Form 591 was signed by the lead inspector.

File No.: 51

Licensee: Energy Solution, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 11/20/03

License No.: 287-05  
Priority: 2  
Inspector: MG

Comments:

- a) Inspection report was completed approximately 4 months after the completion of the inspection.
- b) Inspection report and Form 591 were not signed by the inspector.

File No.: 52  
Licensee: Energy Solution, LLC  
Inspection Type: Routine, Unannounced  
Inspection Date: 11/22/05

License No.: 287-05  
Priority: 2  
Inspector: MG

Comment:

- a) Inspection report and Form 591 were not signed by the inspector.

INSPECTOR ACCOMPANIMENTS

The following inspection accompaniments were performed prior to the on-site review:

Accompaniment No.: 1  
Licensee: Palmetto Richland Memorial Hospital  
Inspection Type: Routine, Announced  
Inspection Date: 5/8/07

License No.: 40  
Priority: 2  
Inspector: AR

Comment:

Inspector did not physically verify the operability of the closed-circuit television, intercom, source status indicator lights, etc.

Accompaniment No.: 2  
Licensee: Jacobs Applied Technology, Inc.  
Inspection Type: Increased Controls, Announced  
Inspection Date: 5/8/07

License No.: 205  
Priority: 1  
Inspector: MW

Accompaniment No.: 3  
Licensee: Applied Technology Services, Inc.  
Inspection Type: Routine, Announced  
Inspection Date: 5/9/07

License No.: 410  
Priority: 1  
Inspector: LC

Accompaniment No.: 4  
Licensee: Chem Nuclear Systems, LLC  
Inspection Type: Routine, Announced  
Inspection Date: 7/12/07

No.: 097  
Priority: 1  
Inspector: MY

Comment:

Site conditions and variations in operations were photographed by the inspector during the inspection.

APPENDIX D

LICENSE CASEWORK REVIEWS

NOTE: CASEWORK LISTED WITHOUT COMMENT ARE INCLUDED FOR COMPLETENESS ONLY.

SOUTH CAROLINA BUREAU OF RADIOLOGICAL HEALTH

File No.: 1 Licensee: Mahlo America, Inc. Type of Action: Amendment Date Issued: 5/22/07	License No.: 142 Amendment No.: 19 License Reviewer: MW
File No.: 2 Licensee: Low Country Diagnostics, Inc. Type of Action: Renewal Date Issued: 12/30/05	License No.: 521 Amendment No.: 19 License Reviewer: MB
File No.: 3 Licensee: Shertech Laboratories, LLC Type of Action: New Date Issued: 12/14/05	License No.: 816 Amendment No.: N/A License Reviewer: MB
File No.: 4 Licensee: Smurfit-Stone Container Enterprises, Inc. Type of Action: Amendment Date Issued: 7/13/07	License No.: 080 Amendment No.: 32 License Reviewer: MW
File No.: 5 Licensee: Medical University of SC Type of Action: Renewal Date Issued: 1/24/07	License No.: 081 Amendment No.: 70 License Reviewer: MB
File No.: 6 Licensee: Palmetto Health Richland Type of Action: Renewal Date Issued: 9/9/03	License No.: 586 Amendment No.: 9 License Reviewer: MB
File No.: 7 Licensee: Georgetown Cancer Center Type of Action: New Date Issued: 9/28/04	License No.: 786 Amendment No.: N/A License Reviewer: MB
File No.: 8 Licensee: Carolina Cardiology Consultants, P.A. Type of Action: New Date Issued: 7/13/07	License No.: 854 Amendment No.: N/A License Reviewer: KW

File No.: 9  
Licensee: ESP Associates, P.A.  
Type of Action: Amendment  
Date Issued: 10/11/06

License No.: 792  
Amendment No.: 2  
License Reviewer: LC

File No.: 10  
Licensee: Furman University  
Type of Action: Amendment  
Date Issued: 3/6/07

License No.: 052  
Amendment No.: 15  
License Reviewer: AR

File No.: 11  
Licensee: Washington Group International, Inc.  
Type of Action: Amendment  
Date Issued: 3/22/07

License No.: 419  
Amendment No.: 48  
License Reviewer: MW

File No.: 12  
Licensee: Bausch & Lomb  
Type of Action: Amendment  
Date Issued: 7/19/06

License No.: 431  
Amendment No.: 12  
License Reviewer: AR

File No.: 13  
Licensee: JANX Integrity Group  
Type of Action: Reciprocity  
Date Issued: 6/12/06

License No.: NRC 21-16560-01  
Amendment No.: 16  
License Reviewer: HL

File No.: 14  
Licensee: Westinghouse Electric Company  
Type of Action: Termination  
Date Issued: 9/10/03

License No.: 317  
Amendment No.: 18  
License Reviewer: JP

SOUTH CAROLINA DIVISION OF RADIOACTIVE WASTE MANAGEMENT

NOTE: In addition to the files listed below, licensing actions in the casework of the Division listed in Appendix C were also reviewed without comment.

File No.: 15  
Licensee: TD\*X Technical Center, LLC  
Type of Action: New  
Date Issued: 2/23/07

License No.: 843  
Amendment No.: 1  
License Reviewer: MY

File No.: 16  
Licensee: First Equity Investors, LLC  
Type of Action: New  
Date Issued: 6/4/07

License No.: 847  
Amendment No.: 1  
License Reviewer: MY

APPENDIX E  
INCIDENT CASEWORK REVIEWS

NOTE: CASEWORK LISTED WITHOUT COMMENT ARE INCLUDED FOR COMPLETENESS ONLY.

File No.: 1

Licensee: Medical University of South Carolina  
Date of Incident: 7/31/03  
Investigation Date: N/A

License No.: SC-080  
Incident Log No.: SC030006  
Type of Incident: Medical Event  
Type of Investigation: N/A

File No.: 2

Licensee: Costal Engineering and Testing Co.  
Date of Incident: 10/10/03  
Investigation Date: 10/10/03

License No.: SC-368  
Incident Log No.: SC030007  
Type of Incident: Theft of RAM  
Type of Investigation: Licensee Report

File No.: 3

Licensee: Sun Chemical Co.  
Date of Incident: 11/10/03  
Investigation Date: N/A

License No.: SC-765  
Incident Log No.: SC030008  
Type of Incident: Loss of RAM  
Type of Investigation: N/A

File No.: 4

Licensee: Palmetto Health Baptist Hospital  
Date of Incident: 3/17/04  
Investigation Dates: Various

License No.: SC-076  
Incident Log No.: SC040003  
Type of Incident: Overexposure  
Type of Investigation: Licensee Report

File No.: 5

Licensee: Cancer Center of the Carolinas  
Date of Incident: 6/3/04  
Investigation Date: N/A

License No.: SC-676  
Incident Log No.: SC040004  
Type of Incident: Medical Event  
Type of Investigation: N/A

File No.: 6

Licensee: King Asphalt, Inc.  
Date of Incident: 9/3/04  
Investigation Date: 9/3/04

License No.: SC-436  
Incident Log No.: SC040005  
Type of Incident: Theft of RAM  
Type of Investigation: Phone

File No.: 7

Licensee: Shealy Environmental Services  
Date of Incident: 10/18/04  
Investigation Date: 10/18/04

License No.: SC-426  
Incident Log No.: SC040006  
Type of Incident: Loss of RAM  
Type of Investigation: Phone

File No.: 8

Licensee: Atlantic Shutter  
Date of Incident: 3/22/05  
Investigation Date: N/A

License No.: N/A  
Incident Log No.: SC050001  
Type of Incident: Loss of RAM  
Type of Investigation: N/A

File No.: 9

Licensee: Professional Service Industries, Inc.  
Date of Incident: 5/12/05  
Investigation Date: N/A

License No.: SC-090  
Incident Log No.: SC050003  
Type of Incident: Theft of RAM  
Type of Investigation: N/A

File No.: 10

Licensee: Geo-Systems Design and Testing  
Date of Incident: 9/1/05  
Investigation Date: 9/6/05

License No.: SC-412  
Incident Log No.: SC050004  
Type of Incident: Loss of RAM  
Type of Investigation: Phone

File No.: 11

Licensee: East Coast Isotopes, Inc.  
Date of Incident: 12/14/05  
Investigation Date: N/A

License No.: SC-705  
Incident Log No.: SC050007  
Type of Incident: Theft of RAM  
Type of Investigation: N/A

File No.: 12

Licensee: Froehling and Robertson, Inc.  
Date of Incident: 6/23/06  
Investigation Date: N/A

License No.: SC-170  
Incident Log No.: SC060006  
Type of Incident: Damaged Gauge  
Type of Investigation: N/A

File No.: 13

Licensee: Trident Medical Center  
Date of Incident: 6/27/06  
Investigation Date: N/A

License No.: SC-210  
Incident Log No.: SC060007  
Type of Incident: Equipment Failure  
Type of Investigation: N/A

File No.: 14

Licensee: Giant Cement Co.  
Date of Incident: 7/5/2006  
Investigation Date: N/A

License No.: GL-0081  
Incident Log No.: SC060008  
Type of Incident: Loss of RAM  
Type of Investigation: N/A

File No.: 15

Licensee: Cryovac Sealed Air Corporation  
Date of Incident: 5/6/06  
Investigation Date: N/A

License No.: SC-231  
Incident Log No.: SC060009  
Type of Incident: Leaking Source  
Type of Investigation: N/A

File No.: 16

Licensee: Care Alliance Health Services-Roper Hospital

Date of Incident: 1/9/07

Investigation Date: N/A

License No.: SC-646

Incident Log No.: SC070001

Type of Incident: Equipment Failure

Type of Investigation: N/A

File No.: 17

Licensee: Millikin

Date of Incident: 12/21/06

Investigation Date: 1/4/07

License No.: GL-0060

Incident Log No.: SC070002

Type of Incident: Loss of RAM

Type of Investigation: Site

File No.: 18

Licensee: McLeod Regional Medical Center

Date of Incident: 10/9/06

Investigation Date: 11/2/06

License No.: SC-139

Incident Log No.: SC070003

Type of Incident: Medical Event

Type of Investigation: Site

Comment:

This event resulted in an Abnormal Occurrence.

APPENDIX F  
SEALED SOURCE AND DEVICE CASEWORK REVIEW

File No. 1:

Registry No.: SC-1276-D-101-G

Applicant's Name: Mahlo America, Inc.

Date Issued: 4/26/07

SS&D Use Code: (E) Beta Gauges

Type of Action: New Registration

SS&D Reviewers: JJ, JP

Comments:

- a) Promethium-147 is incorrectly identified as Promathium-147 twice on Page 1 of the registration.
- b) Sr-90 is incorrectly identified as Sr-95 on page 4 of the registration.
- c) A letter referenced in the registration as letter dated October 30, 2006, was actually received on October 30, 2006. The letter was dated October 24, 2006.