

January 24, 1997

FOR: The Commissioners

FROM: Hugh L. Thompson, Jr. /s/  
Acting Executive Director for Operations

SUBJECT: REMOVAL OF RTI, INC., FROM SITE DECOMMISSIONING MANAGEMENT PLAN

## PURPOSE:

To inform the Commission that remedial action has been completed at the RTI, Inc., site in Rockaway, New Jersey. The staff plans to release the site for unrestricted use and remove the site from the Site Decommissioning Management Plan (SDMP).

## SUMMARY:

The licensee has resolved all outstanding issues related to former onsite disposals, soil contamination, and financial assurance. Based on the actions taken by the licensee, the results of the licensees' final surveys, and the results of Nuclear Regulatory Commission confirmatory surveys, the staff plans to notify the licensee, by letter, that the NRC "plans no further action on this site." Region I discussed the results of the surveys with the State of New Jersey, Department of Environmental Protection. New Jersey representatives indicated that they have no unresolved concerns regarding the radiological issues at the site.

## BACKGROUND:

In SECY-90-121, the original SDMP, and in subsequent revisions to the SDMP (SECY-91-096, -92-200, -93-179, and -95-209), the staff identified approximately 50 sites that warranted special NRC oversight, to ensure timely and safe remediation of residual radioactive material in excess of the current NRC criteria for release for unrestricted use. One of these sites is the RTI, Inc., facility in Rockaway, New Jersey.

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The staff added this site to the SDMP list for the following reasons:

1. Onsite disposals had been made but the location and extent of the disposals were not well-known;
2. The extent and location of soil contamination on this site were not well-known;
3. Past problems with licensee management led to uncertainty about the licensee's willingness and ability to remediate this site in a timely and effective manner; and
4. The NRC staff had concerns about the licensee's compliance with the financial assurance provisions outlined in 10 CFR 30.35.

This facility was originally licensed as Radiation Technology Incorporated in 1970. RTI, Incorporated (RTI) -- the current company name -- was licensed to operate a megacurie pool irradiator near Rockaway, New Jersey. The site is located in a suburban location on approximately 6 hectares (15 acres) of land in northeastern New Jersey. The irradiator and facility buildings occupy a 2-hectare (5-acre) fenced site on the north side of Lake Denmark Road about 90 meters (300 feet) south of Lake Denmark. RTI also owns approximately 81 hectares (201 acres) of property, directly across the road from the licensed site.

The irradiator uses up to  $1.1 \text{ E}+17 \text{ Bq}$  (3 million curies) of Cobalt-60 (Co-60) in sealed sources to produce high-intensity gamma ray fields for the sterilization of disposable medical supplies. In addition, RTI irradiates, to a much lesser extent, cosmetics, hospital supplies, and pharmaceuticals, as well as spices and food containers. Irradiation services are supplied principally to manufacturers whose products are prepackaged for irradiation before delivery to the site. The Co-60 sources are stored in a pool of water for shielding when the source racks are not in use. RTI operates two other facilities located in North Carolina and New Jersey. The irradiator at the Rockaway facility is surrounded by a concrete biological shield. The facility is constructed of ordinary reinforced concrete.

In 1976 and 1977, the licensee disposed of solid radioactive waste by burial onsite. These burials were intended to be made pursuant to 10 CFR 20.304, but the documentation of such burials was poor. The only documented burials were located in the northeast corner of the 2-hectare (5-acre) fenced area of the site, and included the spent resins used in pool cleanup activities. The extent of these burials was unknown. These burials also resulted in Co-60 soil contamination in the areas around the burials.

In the late 1970s, a product commercially known as "radwood" evidently struck one of the stationary source racks as the tank containing the radwood was being lowered into the pool, damaging one of the sealed sources. Leakage from the damaged source resulted in Co-60 contamination of the irradiator storage pool water. The contamination was not immediately identified. Flocculent and other cleaning agents used in cleaning the (believed uncontaminated) pool of dirt and algae were swept onto the ground south of the irradiator building. During the first few years after the introduction of the contamination from the damaged source, the resins used for pool cleanup activities were disposed of in onsite burial pits.

Once identified in 1986, the Co-60 contamination in the pool was removed primarily via the water treatment system, by ion exchange on the resin demineralizers and by adsorption on activated charcoal and diatomaceous earth. As the contamination in the pool water diminished, it became

permissible to regenerate the resins. Each regeneration resulted in 1100 to 1500 liters (300 to 400 gallons) of backwash water. The backwash water was chemically neutralized and analyzed for radioactive material concentration before disposal. Backwash water was disposed of by pumping the water onto the ground outside of the equipment room, on the south side of the irradiator building. Although there are no indications that the level of Co-60 in the backwash water exceeded the limit permitted by 10 CFR Part 20, over a period of several years this method of disposal caused a significant accumulation of Co-60 on and near the surface of the ground immediately south of the irradiator building.

RTI has also been the subject of several escalated enforcement actions. In connection with a 1986 investigation of the licensee's facility, NRC temporarily suspended the Company's license to operate for an aggregate of 77 days. The suspension was based on willful violations of NRC regulations involving deliberate bypassing of certain safety systems designed to protect plant workers from accidental exposure to radiation. In addition, Company officials pled guilty to two felony convictions for willfully providing false information to NRC and were fined \$100,000. The Company officials were found guilty and sentenced to two-year prison terms for violating conditions of the license and willfully providing false information to NRC.

In April 1986, the RTI Board initiated major changes in personnel, equipment, and key management positions, in response to NRC escalated enforcement. These changes were intended to make the personnel more cognizant of regulations applicable to the licensed activities onsite. Inspections, interviews, direct observations, and reviews of old records by staff and the new management revealed that past management practices had resulted in accumulation of poorly documented low-level contaminated waste at the Rockaway facility. In response to these findings, the new management initiated a series of remedial action tasks to identify, characterize, and remediate the site, to come into full compliance with Federal and State regulations. NRC eventually renewed the license for a probationary period of six months. Since that time the licensee has been in good standing.

Finally, in 1990, staff informed the licensee that, based on the possession limits for the sealed sources in the irradiator and the Co-60 contamination listed on the license, an additional \$150,000 would be required for financial assurance. The licensee provided adequate financial assurance for the sealed sources in the irradiator, but argued that the possession limit for Co-60 contamination listed on its license should be reduced based on surveys and remediation activities performed to date. Staff maintained that radioactive contamination was present and as such, this licensee would be required to either submit appropriate financial assurance, or provide evidence that the site could meet the guidelines for unrestricted release.

In April 1996, SteriGenics International notified NRC that it planned to purchase the stock of South Jersey Process Technology, Inc. (RTI's Salem, New Jersey, facility) and lease the irradiator facility in Rockaway, New Jersey, from RTI, Inc. This SteriGenics International purchase of RTI stock also included the purchase of RTI's third irradiator facility in Haw River, North Carolina. SteriGenics International operates seven commercial irradiators in the United States, under various Agreement State licenses, and one facility in Ohio, under NRC jurisdiction. SteriGenics was issued a new license for the Rockaway, New Jersey, irradiator facility on August 8, 1996. The remediated areas on the Rockaway site remain as a separate license issued to RTI, Inc.; this license will be terminated after removal of this site from the SDMP list. The license issued to SteriGenics for operations of the irradiator will not be affected by this action.

#### DISCUSSION:

During a search of buried chemical and possibly radioactive waste in December 1986, RTI informed Region I of the initial findings of excavations conducted on the northeast corner of the property. Initial radiation surveys were performed and exploratory excavations were made in areas where burials were believed to have occurred. One of the excavations resulted in a positive identification of buried radioactive material, including resin material used in pool cleanup activities and other equipment such as disposable gloves that had been disposed of in burial pits within the fenced site. Radiation levels indicated a reading of  $1.6 \text{ E-}7 \text{ C/kq/hr}$  (600 microR/hr) at the bottom of one excavation. Soil and water samples taken from the same excavation revealed no radioactive contamination. However, Co-60 contaminated soil was identified outside the fenced site in a wooded area, evidently resulting from surface water run-off in that area. In addition, a small amount of cesium-137 contamination was identified in an area north of the fence, evidently resulting from wash-off of external contamination from a shipping cask.

In March 1987, Region I identified specific documentation that revealed that burials or re-burials of radioactive waste (i.e., material that was reportedly buried between 1976-1977 which might have been unearthed and re-buried between 1981-1982) had occurred. In response to these findings, Region I accelerated actions to characterize the RTI property and issued a Confirmatory Action Letter (87-92) that documented the licensee's commitments to: 1) comprehensively survey the suspected portions of the property inside the 2-hectare (5-acre) fenced site; 2) develop a plan to detect buried matter via non-invasive techniques (i.e., ground-penetrating radar), by a qualified contractor; and 3) develop a remediation action plan for any contamination identified and inform the regional office before performing any invasive action to explore or uncover buried waste.

Region I also contracted Oak Ridge Associated Universities (now Oak Ridge Institute for Science and Education) to perform an independent characterization survey of the unrestricted areas of RTI's property.

On April 6, 1987, a magnetometry scan was performed, over a wide area of the RTI property, that indicated that ferromagnetic materials were buried on parts of the site, specifically on the northeast corner of the fenced area. On April 13, 1987, Oak Ridge Associated Universities initiated an independent characterization survey of the unrestricted areas of RTI's property to determine if the licensee's contamination control procedures had been effective in the past. The survey identified four areas contaminated with Co-60 in excess of NRC guidelines. Three of the areas were located within the fenced area of the site and the fourth was located outside the fenced area along a creek that drains into Lake Denmark. One of the locations within the fenced area of the site included a survey immediately south of the irradiator building, which indicated that the soil was slightly contaminated with Co-60 and Cs-137. The cesium contamination was most likely from a contaminated GE model 1500 cask that was periodically used and situated at this location.

The licensee submitted a remedial action plan and schedule in May 1987 and remediation began on June 4, 1987. Based on the magnetometry scan performed earlier that year, five separate pits were selected for excavation. The remediation began by initiating excavation of pit 1. The final size of pit 1 was 15 meters (50 feet) long, 9 meters (30 feet) wide, and 2.7 meters (9 feet) deep. Excavation of pit 1 unearthed a number of contaminated items

including drums, pails, diatomaceous earth pumps, resins, filters, and poly bags containing contaminated items. Excavation of pits 2 and 3 unearthed debris consisting of rotted wood, corroded metal objects, and gravel, but no radiological nor hazardous wastes were encountered, based on direct radiation measurements and independent analysis of split soil samples taken from pits 2 and 3 by the licensee and NRC. Excavation of pits 4 and 5 also revealed no radiological nor hazardous wastes. Backfilling of the excavated pits was completed in October 1987 and liquid/sludge analysis was performed. The contaminated soil and dry waste were collected, packaged, and shipped for disposal at a commercial radioactive waste disposal facility in Barnwell, South Carolina. Approximately 14 m<sup>3</sup> (500 ft<sup>3</sup>) of waste were sent for disposal as radioactive waste. Between June and October 1987, Region I inspected the characterization and remediation activities on at least seven separate occasions, including all of the excavations listed above.

In July 1989, the licensee proposed to remediate the area inside the 2-hectare (5-acre) fenced site to 0.55 Bq (15 pCi) of Co-60 per gram of soil and to place a concrete cover over the area south of the irradiator building and to maintain it as a restricted area for at least 5 years (one half-life for Co-60). In May 1990 NRC agreed on the condition that the licensee commit to further remediate the areas if they were to be released for unrestricted use. NRC also required the licensee to provide evidence demonstrating that no additional buried radioactive material or soil contamination in excess of 0.3 Bq/gram (8 pCi/gram) of Co-60 remained onsite. In addition, the licensee was required to provide plans to monitor for potential migration of Co-60 contamination and to provide results of surveys performed to show that remediation activities had been completed as originally proposed. Since no soil contamination in excess of 0.3 Bq/gram (8 pCi/gram) of Co-60 remains, no concrete cover was installed.

In July 1990, the licensee performed limited core sampling as evidence that no contamination existed inside and outside the fenced area of the site. Between 1990 and 1995, licensee efforts to decommission the site continued. In June 1995, NRC required additional surveys and sampling as further evidence to verify that these areas met the release criteria. Since the primary pathway for exposure of individuals from Co-60 is by direct radiation, the licensee and NRC conducted radiation-level surveys. Surveys performed by the licensee on April 24, 1996, showed that radiation levels averaged between 1.0 E-9 to 1.8 E-9 C/kg/hr (4 to 7 R/hr) above background. All areas now meet the exposure criteria of less than 2.6 E-9 C/kg/hr (10 R/hr) above background. All soil samples taken in the areas of concern, inside and outside the fenced areas, revealed that the highest level of Co-60 in the soil was 0.13 Bq/gram (3.4 pCi/gram), below the subsurface limits of 0.30 Bq/gram (8 pCi/gram).

On April 24, 1996, Region I staff collected split samples and performed confirmatory radiological measurements inside and outside the fenced areas of the site property, and in the vicinity of the various buildings. NRC's measurements averaged between 1.3 E-9 to 2.1 E-9 C/kg/hr (5 to 8 R/hr) above background, consistent with the licensee's findings. Soil sample results show that the highest levels in the soil were 0.1 Bq/gram (2.7 pCi/gram) for Co-60 and 0.003 Bq/gram (0.07 pCi/gram) for Cs-137. (The subsurface limit for Cs-137 is 0.56 Bq/gram (15 pCi/gram)).

After review of the soil sample data and the exposure rates of the excavated areas, the staff concludes that the areas of concern at the facility now meet the guidelines for unrestricted release.

#### RECOMMENDATION:

Based on the results of the remedial actions taken by RTI, Inc., the staff review of the docket files, radiological survey reports, and the results of NRC confirmatory measurements, the staff concludes that decommissioning has been satisfactorily completed in the areas of concern (unrestricted areas) at the RTI, Rockaway, New Jersey site. The staff has placed a notice in the Federal Register (61 FR 36585, dated July 11, 1996) stating that the areas of concern meet NRC guidelines for release for unrestricted use. NRC plans no further actions and intends to remove this site from the SDMP and terminate the license.

In addition, the staff has notified the U.S. Environmental Protection Agency and the State of New Jersey of NRC's intent to remove the site from the SDMP.

It is the staff's intention, unless otherwise directed by the Commission, within ten days from the date of this paper, to send a letter to RTI, Inc., (attachment) stating that the RTI site meets current NRC requirements for release for unrestricted use and that NRC intends to remove the site from the SDMP. The license will then be terminated.

#### COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.

Hugh L. Thompson, Jr.  
Acting Executive Director for Operations

Attachment: Draft letter to RTI, Inc.

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ATTACHMENT

**DRAFT**

Mr. John D. Schlecht  
Director of Operations  
RTI Incorporated  
108 Lake Denmark Road  
Rockaway, New Jersey 07866

SUBJECT: REMOVAL OF THE RTI, INC., ROCKAWAY, NEW JERSEY, FACILITY FROM THE U. S. NUCLEAR REGULATORY COMMISSION SITE  
DECOMMISSIONING MANAGEMENT PLAN

Dear Mr. Schlecht:

I am responding to your letter dated June 14, 1996, requesting that the U.S. Nuclear Regulatory Commission release the RTI, Inc., Rockaway, New Jersey, site for unrestricted use and remove the site from the Site Decommissioning Management Plan (SDMP). We have reviewed your reports from the radiological surveys and analysis of soil samples and conducted our own radiological survey. We conclude that all remediated areas at the facility meet the criteria for release for unrestricted use as discussed in the "Action Plan to Ensure Timely Cleanup of Site Decommissioning Management Plan Sites" (the Action Plan) (57 FR 13389-13392) and NRC's current soil contamination criteria.

In accordance with your request, we are removing the RTI, Inc., Rockaway, New Jersey, site from the SDMP list. Further remedial action is not required.

As noted in the Action Plan, this is the Commission's final action on the referenced license. NRC will not require any additional decommissioning in response to future NRC criteria or standards, unless additional contamination, or noncompliance with your Remedial Action Plan submitted to NRC in April 1987, is found, indicating a significant threat to public health and safety.

Thank you for your cooperation in this matter. If you have any questions about our action, please contact Anthony Dimitriadis of my staff at (610) 337-6953 or me at (610) 337-5200. I trust that this reply responds to your request.

Sincerely,  
Ronald R. Bellamy, Chief  
Decommissioning & Laboratory Branch  
Division of Nuclear Materials Safety

License No.29-13613-02

Docket No.030-07022

cc: State of New Jersey  
EPA, Region II

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