CINTICHEM, INC.
a wholly owned subsidiary of
Medi-Physics, Inc. P.O. BOX 816, TUXEDO, NEW YORK 10987 (914) 351-2131

June 29, 1990

Director, Office of Nuclear Material
Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

SUBJECT: Request for Amendment of SNM-639/Docket 70-687;
Program Code 21130

Cintichem, Inc., Long Meadow Road, Tuxedo, New York requests amendment of our Special Nuclear Materials License Number SNM-639. In addition to the revisions/updates submitted for our license renewal in September 1989, enclosed are requested revisions to help support our planned decommission efforts. Each revision is indicated with a hash mark in the right hand column. These revisions will not decrease the overall effectiveness of our Special Nuclear Material Program. Please find enclosed a company check for license amendment application fee of $150.00

To help support this amendment request, Cintichem submits the following justifications for each proposed revision:

1. CURRENT: SECTION 2.5, PAGE 1.2 - 6

Health Physics Supervisor	B.S. Degree in science or physics and at least five years experience in radiological health and safety.

PROPOSED REVISION:

Health Physics Supervisor	B.S. Degree in science, physics, or equivalent and/or at least five years experience in radiological health and safety.

JUSTIFICATION:

Proposed revision better reflects current technical requirements and qualified available personnel for Cintichem site position of Health Physics Supervisor.

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2. CURRENT: SECTION 3.2.1 (4), PAGE 1.3 - 2

4. A changing room and shower facility shall be provided for personnel. The shower facility shall be used by employees for removal of body contamination as recommended by Health Physics. Contamination levels over significant portions of the body which are above the skin contamination limits of Chapter 12, Section 8.4, shall normally require decontamination. In addition, a washer/dryer unit will be available to attempt to decontaminate personal clothing of employees, visitors, and/or contractors which may become contaminated above the prescribed release limits. This washer/dryer unit will not be utilized to decontaminate any protective clothing specifically used for work with radioactive materials at the site.

PROPOSED REVISION:

4. A changing room and shower facility shall be provided for personnel. The shower facility shall be used by employees for removal of body contamination as recommended by Health Physics. Contamination levels over significant portions of the body which are above the skin contamination limits of Chapter 12, Section 8.4, shall normally require decontamination.

JUSTIFICATION:

Due to current site conditions, Cintichem withdraws amendment request for the installation of a washer/dryer on site.

3. CURRENT: SECTIONS 3.2.2 (5), (10), AND (11), PAGE 1.3 - 3

5. A quarterly efficiency test shall be performed on hot cell carbon effluent filters. The minimum overall efficiency of this filter system is 99.5 percent.

10. The iodine removal efficiency of hot cell effluent charcoal filters in service shall be measured at least quarterly.

11. The filter effectiveness shall be monitored in-place through measurement of actual airborne contaminants in the effluent. If the concentration of particulate airborne radioactive materials approaches 50 percent of the limit specified in Chapter 5 at the location of the nearest resident offsite (locale of concern), the filtering system will be investigated for efficiency and flaws will be corrected.

PROPOSED REVISIONS:

5. A quarterly efficiency test shall be performed on hot cell carbon effluent filters if any radioiodine processing is performed in hot cells. When tested the minimum overall efficiency of this filter system is 99.5 percent.

10. The iodine removal efficiency of hot cell effluent charcoal filters will be measured at least quarterly if any radioiodine processing is performed in the hot cells.

11. If conditions warrant as described in items 5 and 10 above, the filter effectiveness of the hot cell effluent charcoal filters shall be monitored in-place through measurement of actual airborne contaminants in the effluent. If the concentration of particulate airborne radioactive materials approaches 50 percent of the limit specified in Chapter 5 at the location of the nearest resident off-site (locale of concern), the filtering system will be investigated for efficiency and flaws will be corrected.

JUSTIFICATION:

With the cessation of the production, processing, and handling of radioiodine in the Cintichem hot cells, the lack of radioactivity in our effluent is making it very difficult and soon will be impossible to conduct a filter efficiency as per our current SNM-639 license. Therefore, this proposed revision is warranted at this time.

4. CURRENT: SECTION 3.2.3 (9), PAGE 1.3 - 5

Lab Equipment and Survey Meters - 3 months (not exceeding 4 months)

PROPOSED REVISION:

Lab Equipment and Survey Meters - 6 months (not exceeding 7 months)

JUSTIFICATION:

With the reduction in the overall radiation, contamination, operational levels on site due to preparations for decommissioning this revision helps reduce health physics' workload without a reduction in program effectiveness.

5. CURRENT: SECTION 3.2.4 (6), PAGE 1.3 - 5

6. Annual urine analysis shall be required on all individuals working with open sources of radioactive material.

PROPOSED REVISION:

6. Additional urine analysis including other bioassay techniques such as whole body counting shall be performed at the discretion of the Health, Safety, and Environmental Affairs Department.

JUSTIFICATION:

With a significant decrease in employees working with open sources of radioactivity due to preparations for decommissioning and since periodic whole body counting will be performed, this revision will not decrease the effectiveness of our SNM program.

6. CURRENT: SECTION 3.2.4 (12), PAGE 1.3 - 6

12. Surface contamination shall be controlled through daily sampling with the following action levels:

PROPOSED REVISION:

12. Surface contamination shall be controlled through periodic sampling (minimum of three times per week) with the following action levels:

JUSTIFICATION:

With a significant reduction in the potential contamination levels in buildings 1 and 2 due to cessation of operations, a reduction to three times per week versus daily contamination level surveys will not decrease the overall effectiveness of our current program.

7. CURRENT: TABLE 5.2.1 (3) AND (4), PAGES 1.5 - 6 AND 7

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Number of Samples and Sample Locations	Sampling and Collection Frequency	Type and Frequency of Analysis
Water	Indian Kill Inlet	Monthly	Gross Beta - mthly
	Indian Kill Outlet	Monthly	Gross Beta - mthly
	Indian Kill Outlet below sewer plant outlet	Monthly	Gross Beta - mthly
	Warwick Brook	Monthly	Gross Beta - mthly
	Sterling Lake Outlet	Monthly	Gross Beta - mthly
	Jones Spring	Monthly	Gross Beta - mthly
	Ramapo River	Monthly	Gross Beta - mthly
	Holding Pond Outlet	Monthly	Gross Beta - mthly
Natural Precipitation	Four off-site air sample locations	Monthly	Gross Beta - mthly
Holding Tank Composite	On-site holding tanks	Monthly	Gross Beta - mthly

PROPOSED REVISIONS:

Exposure Pathway and/or Sample	Number of Samples and Sample Locations	Sampling and Collection Frequency	Type and Frequency of Analysis
Water	Indian Kill Inlet	Quarterly	Mixed Gamma Fission Products
	Indian Kill Outlet	Quarterly	Mixed Gamma Fission Products
	Indian Kill Outlet below sewer plant outlet	Quarterly	Mixed Gamma Fission Products
	Warwick Brook	Quarterly	Mixed Gamma Fission Products
	Sterling Lake Outlet	Quarterly	Mixed Gamma Fission Products
	Jones Spring	Quarterly	Mixed Gamma Fission Products
	Ramapo River	Quarterly	Mixed Gamma Fission Products
	Holding Pond Outlet	Quarterly	Mixed Gamma Fission Products
Natural Precipitation	Four off-site air sample locations	Quarterly	Mixed Gamma Fission Products
Holding Tank Composite	On-site holding tanks	Quarterly	Mixed Gamma Fission Products

JUSTIFICATION:

In preparation for decommissioning and due to the cessation of operations in buildings 1 and 2, a reduction in certain sampling frequencies is warranted. Also, since our analytical techniques have vastly improved, gross beta analysis will no longer be performed as indicated.

8. CURRENT: SECTION 9.1 AND 9.2, PAGE 11.9 - 1

PART II - SAFETY DEMONSTRATION

CHAPTER 9 OVERVIEW OF OPERATION

9.1 CORPORATE INFORMATION

The land and improvements of the Cintichem facility in Tuxedo, New York, are owned by Medi+Physics, Inc. of Paramus, New Jersey which is a wholly-owned subsidiary of Hoffmann-La Roche of Nutley, New Jersey.

9.2 FINANCIAL QUALIFICATION - OPERATION

The Cintichem facility in Tuxedo, New York, operates under the financial and administrative control of Medi+Physics, Inc. The 1989 Medi+Physics, Inc. Annual Report is enclosed as evidence of financial responsibility. (Refer to Annex "C").

PROPOSED REVISIONS:

9.1 CORPORATE INFORMATION

The land and improvements of the Cintichem facility in Tuxedo, New York, are owned by Hoffmann-La Roche of Nutley, New Jersey.

9.2 FINANCIAL QUALIFICATION - OPERATION

The Cintichem facility in Tuxedo, New York, operates under the financial and administrative control of Hoffmann-La Roche.

JUSTIFICATION:

Revision is necessary to reflect current parent company due to purchase of Medi+Physics, Inc. by Amersham International (not including Cintichem, Inc.) on June 13, 1990.

9. CURRENT: SECTION 10.3, PAGE 11.10 - 9

Iodine in hot lab exhaust is grab sampled before and after the exhaust air carbon filter bank to check the filter bank efficiency.

PROPOSED REVISION:

As required, iodine in hot lab exhaust is grab sampled before and after the exhaust air carbon filter bank to check the filter bank efficiency.

JUSTIFICATION:

As indicated in item 3 above, the lack of radioiodine in our hot cell effluent will soon make it impossible to perform a filter bank efficiency as per our current SNM license. This specific proposed revision is a reflection of this situation.

In closing, if any further information is necessary regarding this amendment request, please contact me. Your prompt consideration of this matter is greatly appreciated.

Sincerely,

T. L. Vaughn
Manager, Health, Safety and
Environmental Affairs

TLV/bjc

Enclosures

cc: U. S. Nuclear Regulatory Commission
Regional Administrator
Region I
475 Allendale Road
King of Prussia, PA 19406

CINTICHEM, INC.

STERLING FOREST LABORATORY

SPECIAL NUCLEAR MATERIALS LICENSE

SNM - 639

DOCKET - 70 - 687

JUNE 27, 1990

SNM/20E

Reactor Supervisor	B.S. Degree in engineering or science with emphasis in nuclear technology and/or a minimum of five years work experience in nuclear reactor operations. Incumbent must possess a Senior Reactor Operator's License.
Hot Lab Operations Supervisor	B.S. Degree in science or engineering or a minimum of five years operating experience in reactor or hot cell operations.
Reactor Project Engineer	B.S. Degree in science or engineering or at least five years related work experience in nuclear reactor operations. Incumbent should possess a Reactor Operator's License.
Health Physics Supervisor	B.S. Degree in science, physics, or equivalent and/or at least five years experience in radiological health and safety.
Staff Health Physicist	B.S. Degree in science, physics, or biology and at least five years experience in radiological health and safety.
Radiation Safety Officer	B.S. Degree in science, physics, or biology and at least five years experience in radiological health and safety.

2.6 TRAINING

Training and requalification of personnel in safety related matters shall be accomplished as follows:

(a) New personnel shall be assigned to the Health Physics Department for initial radiation safety training. The Health Physics Department shall determine the duration and depth of training which will be dependent on the job assignment and previous experience of the new employee. Upon completion of this initial radiation safety training, the employee's knowledge shall be tested and documented by means of a written examination. This initial training shall be sufficient so that follow-up job training can be continued by the supervisor who will assign an experienced radiation worker to work with the new employee. The Health Physics Department shall determine the need for additional formal training from follow-up observations and the results of personnel monitoring.

5. All production procedures involving radioactive material must be formally reviewed and found in compliance with the ALARA concept. The review committee shall include a member of Health Physics.

6. Entrance into a high radiation area requires Health Physics approval.

7. All radiation exposures in excess of 50 percent of the limit shall be reported to management at least quarterly.

8. All jobs with projected radiation exposures exceeding 100 mRem or airborne exposures exceeding 10 MPC-Hours to an employee shall require approval from senior Health Physics staff.

9. At the conclusion of jobs requiring senior Health Physics approval the job shall be reviewed to identify areas requiring improvement.

3.2 TECHNICAL REQUIREMENTS

3.2.1 Access Control

1. Hand and foot counters shall be provided at the routine exits of the facility. Employees shall be required to monitor themselves and report contamination levels as per administrative guidelines.

2. Areas requiring special protective clothing will be posted by Health Physics.

3. Health Physics approval shall be required for access to a High Radiation Area.

4. A changing room and shower facility shall be provided for personnel. The shower facility shall be used by employees for removal of body contamination as recommended by Health Physics. Contamination levels over significant portions of the body which are above the skin contamination limits of Chapter 12, Section 8.4 shall normally require decontamination.

3.2.2 Ventilation Requirements

1. Magnahelic pressure drop measuring devices shall be provided on all effluent particulate (HEPA) filters.

2. A magnahelic check of all HEPA filters shall be performed monthly.

3. A check for minimum fume hood air flow of 100 feet per minute is performed quarterly.

4. All plant ventilation systems shall be designed so that air flows from regions of less to more contamination. All hot cells and glove boxes are kept under negative pressure.

5. A quarterly efficiency test shall be performed on hot cell carbon effluent filters if any radioiodine processing is performed in hot cells. When tested the minimum overall efficiency of this filter system is 99.5 percent.

6. The pressure in the hot cells shall be maintained negative relative to ambient pressure within Building 2. The negative pressure shall be sufficient to maintain a flow of 100 linear feet per minute at the commonly used cell penetrations.

7. The pressure drop across any HEPA filter or bank of filters will not exceed 9.5 inches of water. Also, dust loading on HEPA filters which lowers the hood flow velocity below 100 feet/minute will require a change of filters.

8. The auxiliary exhaust fan in Building 2 (EF-12A) will be tested for operability once each quarter. It shall be capable of maintaining a measurable negative pressure inside the hot cells.

9. New or replacement HEPA filters shall be certified as being 99.97 percent efficient for filtering particle sizes greater than 0.3 microns. Particulate releases will be evaluated weekly. An investigation of filter efficiency shall be conducted if the release rate exceeds 25 percent of the license limit.

10. The iodine removal efficiency of hot cell effluent charcoal filters will be measured at least quarterly if any radioiodine processing is performed in the hot cells.

11. If conditions warrant as described in Items 5 and 10 above, the filter effectiveness of the hot cell effluent charcoal filters shall be monitored in-place through measurement of actual airborne contaminants in the effluent. If the concentration of particulate airborne radioactive materials approaches 50 percent of the limit specified in Chapter 5 at the location of the nearest resident off-site (locale of concern), the filtering system will be investigated for efficiency and flaws will be corrected.

Criticality Drill - 6 months
(not exceeding 7 months)

Lab Equipment and Survey Meters - 6 months
(not exceeding 7 months)

The calibration sources used shall be traceable to the National Institute of Standards and Technology (NIST).

10. Instruments will be recalibrated after major repair.

3.2.4 Air Sampling and Internal Radiation Protection

1. Air sampling equipment shall be operated continuously in all areas where unencapsulated radioactive materials are handled.

2. Air sample locations shall be chosen to represent maximum breathing zone concentrations.

3. Air shall be sampled continuously at representative areas of the facility. The samples are evaluated each work day and analyzed weekly. Levels exceeding 10 MPC-Hours shall be investigated.

4. The effluent stack air shall be sampled continuously and analyzed weekly for alpha, iodine, particulate, and noble gas radioactivity.

5. Urine analysis shall be required on all individuals in an area where air sampling results indicate they may have been exposed to airborne radioactivity exceeding 40 MPC-Hrs.

6. Additional urine analysis including other bioassay techniques such as whole body counting shall be performed at the discretion of the Health, Safety, and Environmental Affairs Department.

7. Thyroid uptake shall be determined at least quarterly for all employees processing and dispensing iodine.

8. If a thyroid burden exceeding 25 percent of the limit is detectable in any employee, all other employees working in the same area shall also have their thyroids monitored.

9. Any employee with a thyroid burden exceeding 50 percent of the limit shall have his/her thyroid monitored weekly until the burden falls below 20 percent of that level.

10. If it is suspected that exposure to 10 MPC-Hours occurred, a measurement of thyroid burden will be performed.

11. Respiratory protection is not required under normal conditions of plant operation. Respiratory equipment shall be available for use by approved personnel only. The Health Physics staff shall determine the need for respiratory protection for approved personnel.

12. Surface contamination shall be controlled through periodic sampling (minimum of three times per week) with the following action levels:

    Surfaces of permanent structures within the RCA work areas are controlled and posted if the smearable contamination levels exceed 1,000 dpm/100 cm^2 Beta-Gamma or 100 dpm/100 cm^2 Alpha (Green shoe cover areas). Other (non-shoe cover areas) areas where smearable contamination exceeds 500 dpm/100 cm^2 Beta-Gamma (or 33 dpm/100 cm^2 Alpha) should be decontaminated to maintain the levels in the normally "clean" non-posted areas as low as practical. Examples of these areas are offices, restrooms, break rooms, etc.

    NOTE:

    > Posting is required if smearable contamination exceeds 500 dpm/100 cm2 (Beta-Gamma) or 33 dpm/100 cm^2 Alpha <u>outside of the RCA.</u>

    Controlled contamination areas (Yellow shoe cover areas) such as the conveyor station work areas, where frequent occupancy is anticipated, will be maintained less than 2,000 dpm/100 cm^2 smearable (Beta-Gamma) contamination unless otherwise directed by the Radiation Safety Officer/Designate due to ALARA considerations. Uranium lab controlled contamination areas will be maintained less than 1,500 dpm/100 cm^2 smearable Alpha contamination.

    The requirements for entry into contaminated areas will be as specified on the local postings, on the applicable RWP, or as directed by Health Physics.

TABLE 5.2.1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Number of Samples and Sample Locations	Sampling and Collection Frequency	Type and Frequency of Analysis
3. INGESTION			
Food Products			
	Location to be determined from Land Use Census.	At time of harvest. One sample of broad leaf vegetation.	* I-131 analysis.
Water	Indian Kill Inlet	Quarterly	Mixed Gamma Fission Products
	Indian Kill Outlet	Quarterly	Mixed Gamma Fission Products
	Indian Kill Outlet below sewer plant outlet	Quarterly	Mixed Gamma Fission Products
	Warwick Brook	Quarterly	Mixed Gamma Fission Products
	Sterling Lake Outlet	Quarterly	Mixed Gamma Fission Products
	Jones Spring	Quarterly	Mixed Gamma Fission Products
	Ramapo River	Quarterly	Mixed Gamma Fission Products
	Holding Pond outlet	Quarterly	Mixed Gamma Fission Products
Fish	Indian Kill Reservoir Number determined at time of sampling.	Spring of year after spring overturn	Mixed fission products.
Benthos	Indian Kill Reservoir Number determined at time of sampling.	Annually	Mixed fission products.

TABLE 5.2.1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Number of Samples and Sample Locations	Sampling and Collection Frequency	Type and Frequency of Analysis
4. OTHER			
Sediment	Indian Kill Reservoir Number determined at time of sampling.	Annually	Mixed fission products.
Sewage Sludge	Treatment Plant	Annually	Mixed fission products.
Soil	Selected sites surrounding plant	Annually	Mixed fission products.
Natural Precipitation	Four off-site air sample locations	Quarterly	Mixed Gamma Fission Products
Holding Tank Composite	On-site holding tanks	Quarterly	Mixed Gamma Fission Products

* The maximum values for the lower limit for I-131 are 7×10^{-2} pCi/m^3 airborne concentration and 60 pCi/Kg, wet weight leafy vegetables.

CHAPTER 9 OVERVIEW OF OPERATION

9.1 CORPORATE INFORMATION

The land and improvements of the Cintichem facility in Tuxedo, New York, are owned by Hoffmann-LaRoche of Nutley, New Jersey.

9.2 FINANCIAL QUALIFICATION - OPERATION

The Cintichem facility in Tuxedo, New York, operates under the financial and administrative control of Hoffmann-LaRoche.

9.2.1 Financial Qualifications

The 1989 operating budget for the Reactor and Hot Laboratory is approximately $3.2 million. It is estimated that the annual cost of operations over the next five years will remain relatively constant and the total cost over the new license period will amount to about $16 million (1989 dollars).

9.2.2 Financial Qualifications - Decommissioning

Pursuant to the NRC final rule of June 27, 1988, entitled "General Requirements for Decommissioning Nuclear Facilities, Cintichem will be submitting an updated plan to the NRC by July 26, 1990. Therefore, our current decommissioning plan is submitted for the October 1989 license renewal as originally filed in 1984 with dollar estimates based on 1989 disposal costs.

The following plan and cost estimate for decommissioning the Reactor and Hot Laboratory facility was prepared for NRC license R-81 renewal, docket 50-51.

In order to make this first approximation, the following assumptions are made:

a. Cintichem continues to reside at the Sterling Forest Site.

b. The Reactor and Hot Laboratory buildings remain intact.

c. The USNRC, N.Y.S. Dept. of Health, N.Y.S. Dept. of Environmental Conservation, U.S. Dept. of Environmental Protection, and Sterling Forest Corporation, agree to our proposal for decommissioning.

The cells are maintained at a negative pressure with respect to the operating area and the charging area.

All exhaust air from the Hot Lab passes through roughing filters and absolute filters in the main filter bank prior to discharge, via an exhaust fan, to the stack. The exhaust air from the hot cells is prefiltered through roughing, HEPA, and charcoal filters. Exhaust air from all hoods or glove boxes is prefiltered through roughing and HEPA filters before it passes into the main filter bank. Charcoal filters are provided for hoods or glove boxes in which radioactive iodine is processed. The 50 horsepower exhaust fan, operating on normal power, has a capacity of 30,000 cu.ft/min against a head of 7.5" of water. In the event of a power failure, the fan is automatically switched onto an emergency power system (diesel driven generator) and operates at 1/2 speed on this emergency power supply. (The emergency power supply is described in paragraph 10.2.)

An auxiliary fan (5 horsepower) with a capacity of 8,000 cu.ft/min against a head of 3.0" of water is provided as backup for the 50 horsepower fan. This fan can be operated on either normal or emergency power.

If a rear door of any cell or the door to the decontamination room is opened, the flow of air can be increased by the adjustable louver dampers in the cell filter bank. Normal in-cell operations are not conducted unless normal ventilation is functional. When the normal exhaust ventilation is not functional processes are placed in the safest condition that is practicable.

Exhaust air from the Hot Lab is added to the exhaust air from the reactor area and the combined flow discharges into a 4-foot diameter vent header which leads to a stack. Its base is located on a ridge at an elevation of 945 feet. The stack is 50 feet high and the top is at an elevation of 995 feet, about 187 feet above the main floor of the Hot Lab. All exhaust air entering the stack is continuously monitored for iodine, gaseous and particulate radioactivity. The stack monitor is described in the reactor description.

As required, iodine in hot lab exhaust is grab sampled before and after the exhaust air carbon filter bank to check the filter bank efficiency. The air samples are passed through a collection media of potassium iodide treated activated carbon. The relative amount of iodine-131 on the air sample filter media is counted for both the "before" and "after" samples. The efficiency of the carbon filter bank is determined by applying the following formula:

$$\frac{\text{"before" counts} - \text{"after" counts}}{\text{"before" count}} \times 100 = \text{Percent Efficiency}$$