

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
831 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30333

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
811 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94598

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- A. NEW LICENSE
- B. AMENDMENT TO LICENSE NUMBER _____
- C. RENEWAL OF LICENSE NUMBER STB-258

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

S. F. Appliances Limited
613 W. Washington Street
Morris, IL 60450

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Same as 2.

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Bonnie J. Joneson

TELEPHONE NUMBER

(815) 942-0864

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

9. FACILITIES AND
8702270281 870217
REG3 LIC40
STB-0258 PDR

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)
FEE CATEGORY 2.G. AMOUNT ENCLOSED \$ 230.00

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 28, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE—CERTIFYING OFFICER

TYPED/PRINTED NAME

Bonnie J. Joneson

TITLE

Radiation Safety Officer 7/29/86

DATE

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS	
<\$250K	\$1M-3.8M
\$250K-500K	\$3.8M-7M
\$500K-750K	\$7M-10M
\$750K-1M	>\$10M

b. NUMBER OF EMPLOYEES (Total for entire facility excluding outside contractors)

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Dollar and/or staff hours) ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit it to protect confidential commercial or financial—proprietary—information furnished to the agency in confidence)

YES NO

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS
		2C	

AMOUNT RECEIVED	CHECK NUMBER
\$ 4.30	5166

CONTROL NO. 81546

APPROVED BY

DATE

A-78

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY:** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).
2. **PRINCIPAL PURPOSE(S):** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30, 32, 33, 34, 35 and 40 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.
3. **ROUTINE USES:** The information may be (a) provided to State health departments for their information and use; and (b) provided to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.
5. **SYSTEM MANAGER(S) AND ADDRESS:** U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

S. F. Appliances Limited
613 W. Washington Street
Morris, Illinois 60450

Reference: NRC Form 313 (1 - 84)

Item 5: RADIOACTIVE MATERIAL

- a. Element and Mass #: Natural Thorium
- b. Chemical and/or Physical Form: Thorium Nitrate, granular
- c. Maximum Amount to be Possessed
at any one Time: 910 kilograms

Item 6: PURPOSE FOR WHICH RADIOACTIVE MATERIAL WILL BE USED

For use in manufacturing of incandescent mantles, packaging, and distribution to persons exempt from licensing pursuant to Section 40.13(c) (1) (1) of 10 CFR 40.

Currently the manufacturing process is limited to burning, shaping and cutting of the mantles prior to packaging for distribution. No "solutioning" of mantles is performed. If this step were to be initiated, we would first request an amendment and submit further information.

Procedures for Burning and Shaping Mantles:

- a. Mantles are purchased in an already "solutioned" state mounted on a ceramic ring. These are placed manually on hot molds for shaping.
- b. The mantles are then transferred manually to the process line, a conveyor consisting of rods transported by a chain. Each rod holds 10 mantles.
- c. After traveling approximately 3 feet on the conveyor, the mantles are burned with a gas flame using approximately 12 pounds of gas pressure. The flaming step lasts for about 27 seconds for each rod. On days when mantle burning takes place, about 15 rods (150 mantles) are processed.
- d. After burning, the mantles are left in an ash state and travel another 12 feet down the process line. There are then two additional burning steps which accomplish final shaping of the mantles.
- e. The rod then travels another 3 feet for the cooling process.
- f. Each mantle is then dipped in a "rehardening" solution (non-radioactive) and allowed to dry for 1 hour.

- g. After drying, the mantles are placed in a cutting machine which cuts the bottoms to a uniform length. The scraps from this step are placed in a covered bucket and transferred to the radioactive waste barrel.
- h. The mantles are then packaged for distribution.

Item 7: INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY PROGRAM/TRAINING AND EXPERIENCE

The individual responsible for the radiation safety program is the Radiation Safety Officer, Bonnie J. Joneson. Mrs. Joneson's training and experience records are already on file with your agency, submitted with previous applications. A health physics consulting firm (currently Standard Nuclear Consultants, Ltd., NRC license #12-20362-12) is also retained for regularly scheduled radiation safety consulting visits as well as for "on call" assistance as needed.

Additionally, licensed material may be used by Janice Chapell, whose training and experience records are also on file with your agency.

The Radiation Safety Officer will be familiar with the principles of radiation protection and will have the authority to set radiation policy and to stop any use of radioactive material deemed unsafe. Typical duties of the RSO and/or delegate include the following:

- a. General surveillance over all activities involving radioactive material.
- b. Determining compliance with rules and regulations and license conditions.
- c. Furnishing consulting services on all aspects of radiation safety to personnel at all levels of responsibility.
- d. Receiving delivering and surveying of (nonexempt) shipments of radioactive material arriving at the facility.
- e. Distributing and processing personnel monitoring devices, keeping personnel exposure records and notifying individuals of any exposures approaching maximum permissible amounts and recommending appropriate remedial action.
- f. Conducting training programs and otherwise instructing personnel in the proper procedures for working near the radioactive materials prior to use, at periodic intervals (refresher training), and as required by changes in procedures, equipment, regulations, etc.
- g. Supervising and coordinating the waste disposal program, including keeping waste storage and disposal records.
- h. Storing radioactive materials.
- i. Inventorying radionuclides to limit the quantity to amounts authorized by the license.

Item 8: TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

At the time of initial employment and approximately annually thereafter, all personnel who may come in contact with or frequent areas where radioactive materials are handled or stored will receive the Attachment I minimum instructions.

Records of the dates, topics and attendance of these instructions will be maintained.

Item 9: FACILITIES AND EQUIPMENT

Attached are sketches of the areas in which the radioactive material is used and stored. Whenever authorized personnel are not present, entrance doors to rooms in which radioactive materials are present will be locked to prevent unauthorized access.

Item 10: RADIATION SAFETY PROGRAM

A. Evaluation of radiological hazards from current process operations:

1. Airborne Activity, Unrestricted Areas

During the shaping/burning step of the mantle processing, the only point at which airborne release of radioactive material is likely is during the flaming of the mantles. The effluent air from this step is released directly to the outside through a roof stack. We plan to initiate stack sampling to ensure that 10 CFR 20, Appendix B air concentration limits are not exceeded. In the event concentration limits are exceeded, filtering will be added to decrease these releases to well below the limits.

2. Airborne Activity, Restricted Areas

On May 2, 1986, air samples were collected immediately adjacent to the process line during the flaming step. The sample location was at worker breathing zone level. Pb-212 levels were measured to be approximately 5% of the 10 CFR 20, Appendix C restricted area limit and thorium levels (after thoron daughter decay) of approximately 1.5% of the Appendix C restricted area limit for natural thorium. It does not appear that processing controls or respiratory protection devices will be necessary for these employees.

3. Loose contamination

The only point at which loose contamination should be possible is during the trimming of the mantles prior to packaging. This waste is collected and placed in a covered waste container and then transferred to the radioactive waste barrel for later disposal. Instructions for minimizing personnel contamination are included in the general safety rules.

B. Personnel Monitoring

To evaluate external radiation exposure to personnel, film badges are worn by all individuals whose duties require them to work with or in the vicinity of the radioactive materials. The exchange frequency will be monthly and the badges will be obtained from R.S. Landauer, Jr. or Siemens.

Air sampling results and quantities of radioactive material in use do not appear to warrant a requirement for personnel bioassays.

C. Radiation Surveys

Routine radiation surveys with a low level g.m. survey meter will be performed on a weekly frequency using a low level g.m. survey meter. These will be performed to locate areas of elevated exposures from stored mantles and possibly contaminated surfaces. Special surveys will be performed more frequently as needed if the possibility of loose contamination or spillage exists.

On a semi-annual frequency, the surveys will be supplemented by a more detailed survey and series of wipe tests on each of the five floors by an outside health physics consultant, currently Standard Nuclear Consultants, Ltd.

Air sampling will also be performed by the outside consultant. This will be performed on each of the five floors of the building, on a semi-annual frequency.

Action Levels:

Surface contamination levels of greater than 200 dpm/100cm² will indicate the need for cleaning and re-wipe testing until the levels are reduced as far below 200 dpm/100cm² as possible. Survey meter readings will be used to arrange stored materials to result in lowest possible exposure to personnel.

Air concentrations will be compared to 10 CFR 20 limits and all attempts made to keep those concentrations as far below the limits as reasonably achievable.

D. Radiation Detection Equipment

One (1) Ludlum Model 14 C g.m. survey meter equipped with a Model 44-7 thin-end-window detector, approximately 2 mg/cm² window thickness.

Ranges: 0-0.2 mR/hr through 0-2000 mR/hr.

Calibration of the instrument will be performed annually by Standard Nuclear Consultants, Ltd., License # 12-20362-01, or by other individuals or firms authorized by the NRC to perform these services.

E. General Safety Rules:

1. All areas in which non-exempt quantities of radioactive materials are used or stored are to be posted with "Caution, Radioactive Materials" signs.
2. All containers (unless exempt) of radioactive material are to be clearly marked as to the radioactive content.
3. In the event of theft or loss of radioactive material, every attempt will be made to recover the material as quickly as possible. A calculation will then be made of the amounts of radioactive materials involved and an evaluation of the reporting requirements of 10 CFR 20.402. A report will then be filed by the Radiation Safety Officer within the specified time limit.
4. In the event of an internal emergency such as fire or explosion which involves a radioactive material usage or storage area, employees are to notify the Radiation Safety Officer or delegate immediately and exit the building via the closest exit assigned to the employee's department. Fire extinguishers and intercoms are located on each floor of the building for use by employees.

The local fire department has been apprised of the contents and construction of the building.
5. Radioactive wastes are to be disposed only in specially designated receptacles.
6. Shoes are to be changed when entering and leaving controlled areas. Protective clothing is to be worn at all times except in the lunchroom.
7. Smoking, eating, drinking and application of cosmetics are prohibited in controlled areas.
8. Hands are to be thoroughly washed when leaving a controlled area.
9. Film badges are to be worn at all times when in a controlled area and left in the designated low radiation area when leaving the premises.
10. Accidents are to be reported immediately to the supervisor and employees are to request clarification of any instructions which are not perfectly clear.

Item 11: WASTE MANAGEMENT

Disposal of unused radioactive material waste will follow one or more of the following methods:

- a. Return to supplier
- b. Transfer to an NRC licensed commercial waste disposal service such as U.S. Ecology, Chem-Nuclear or Adco Services.
- c. Transfer to other authorized recipient.

DECOMMISSIONING

At such time that S.F. Appliances current facilities are to be removed from NRC licensed activities, S.F. Appliances, Limited commits to providing the necessary manpower, funding and contractor assistance to decontaminate the building and property to within NRC guidelines for release for unrestricted use.

S.F. Appliances, Limited management has been made aware by the NRC of the February 1986 results of an Oak Ridge Associated Universities radiological survey of its Morris, IL facilities. S.F. Appliances, Limited is committed to following the recommendations of that survey and clean all surfaces, equipment and soil which exceed the applicable NRC limits prior to release for unrestricted use.

Current activities at S.F. Appliances do not appear to be contributing significantly to the contamination of the premises and management is committed to ensuring that all applicable regulations and safety considerations are being met.

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PERSONNEL TRAINING PROGRAM

- I. Individuals who work in or frequent restricted areas will be instructed in the items specified in 10 CFR 19.12 at the time of initial employment and at least annually thereafter.

This instruction will include:

- a. All terms of the license pertinent to radiation safety.
- b. Areas where radioactive material is used or stored.
- c. Potential hazards associated with radioactive material.
- d. Radiological safety procedures appropriate to their respective duties.
- e. Pertinent NRC regulations, including 10 CFR Parts 19, 20, and 40.
- f. Obligation to report unsafe conditions to the Radiation Safety Officer.
- g. Appropriate response to emergencies or unsafe conditions.
- h. Right to be informed of their radiation exposure and bioassay results.
- i. Locations where the licensee has posted or made available notices, copies of pertinent regulations, and copies of pertinent licenses and license conditions (including applications and applicable correspondence), as required by 10 CFR Part 19.

- II. Individuals whose duties may require them to work in the vicinity of licensed material will be informed about radiation hazards and appropriate precautions at the time of initial employment, at least annually thereafter and as required by significant changes in procedures, equipment and/or regulations.

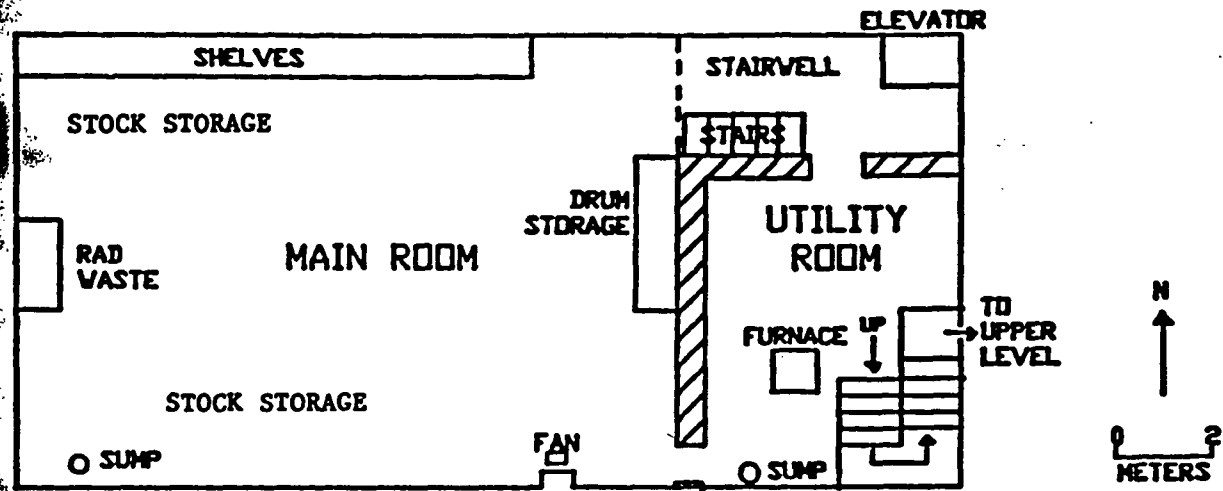


FIGURE 2: Floor Plan of the Sunflame Appliances Facility Subbasement.

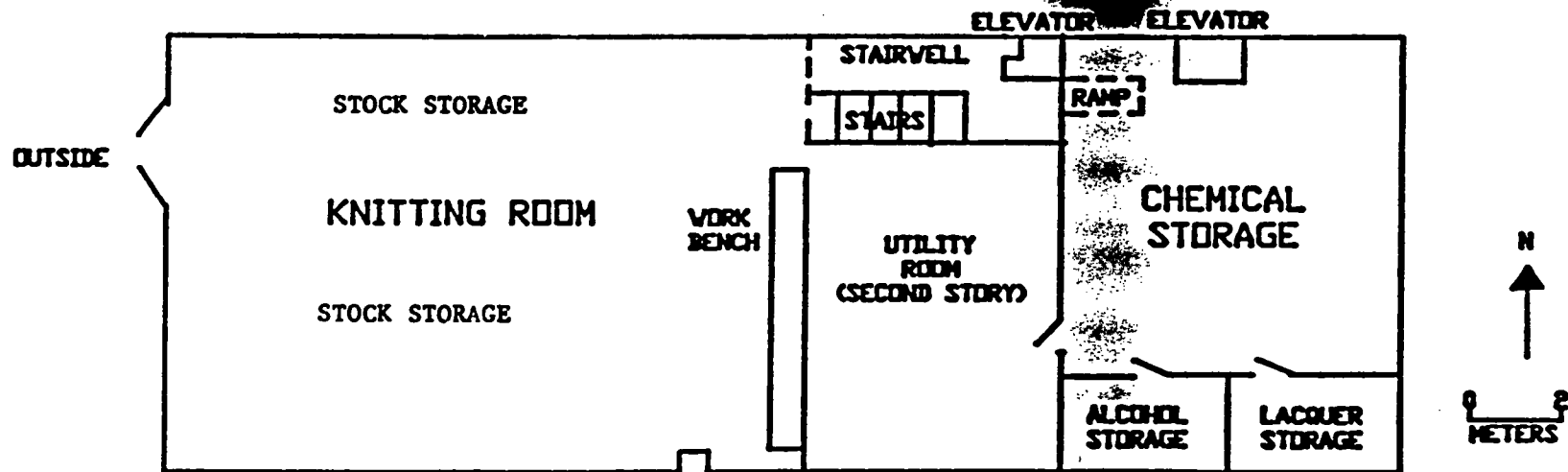


FIGURE 3: Floor Plan of the Sunflame Appliances Facility Basement.

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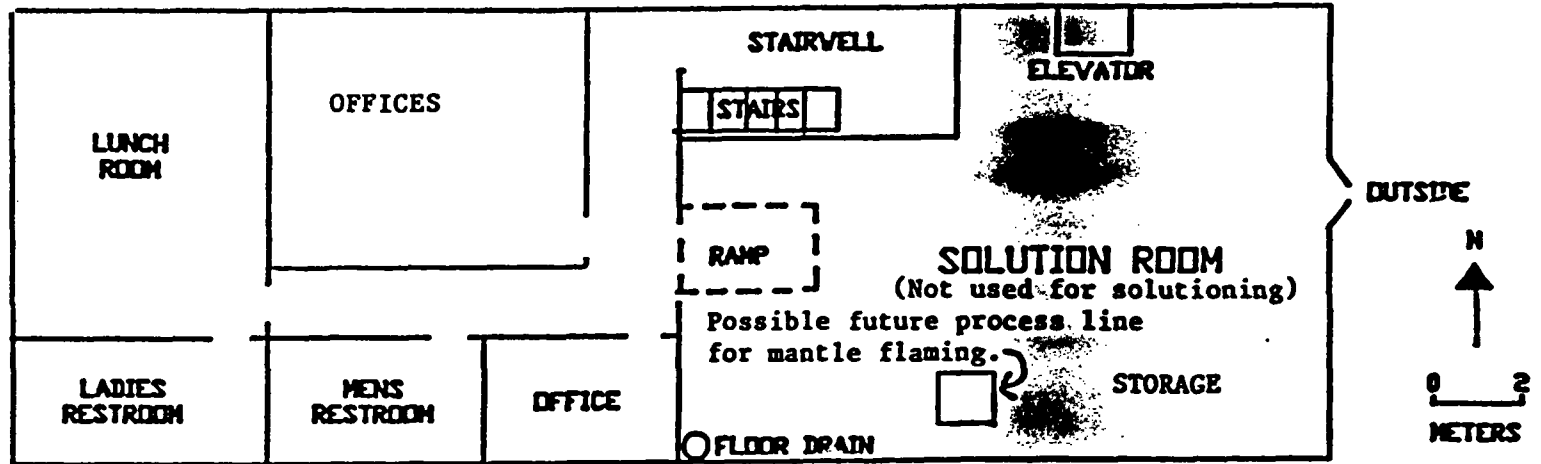


FIGURE 4: Floor Plan of the Sunflame Appliances Facility Main (First) Floor.

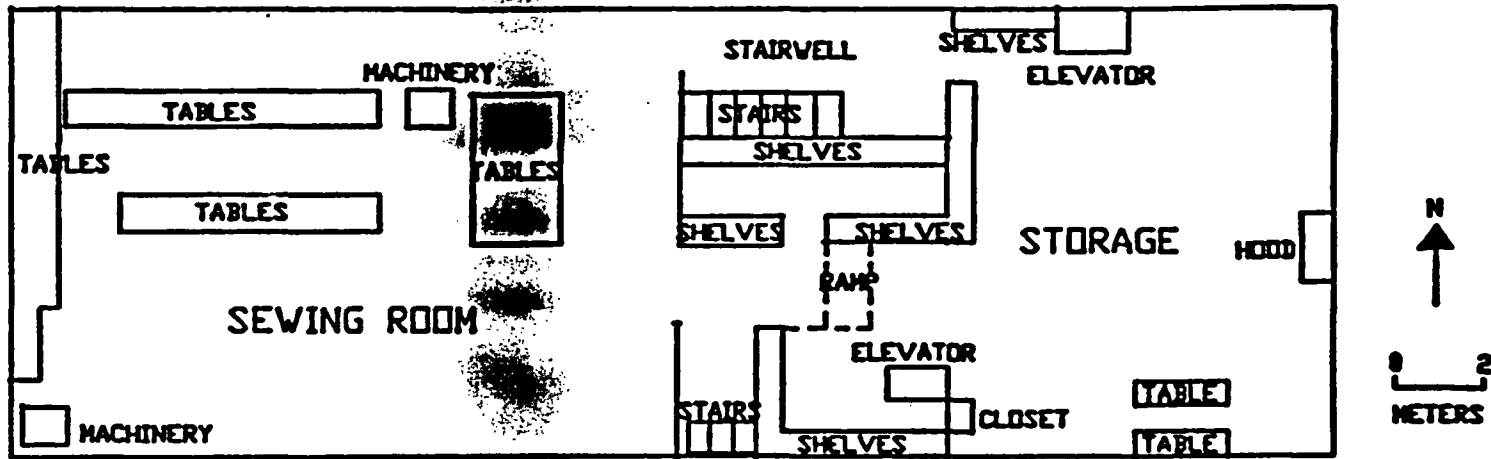


FIGURE 5: Floor Plan of the Sunflame Appliances Facility Second Floor.

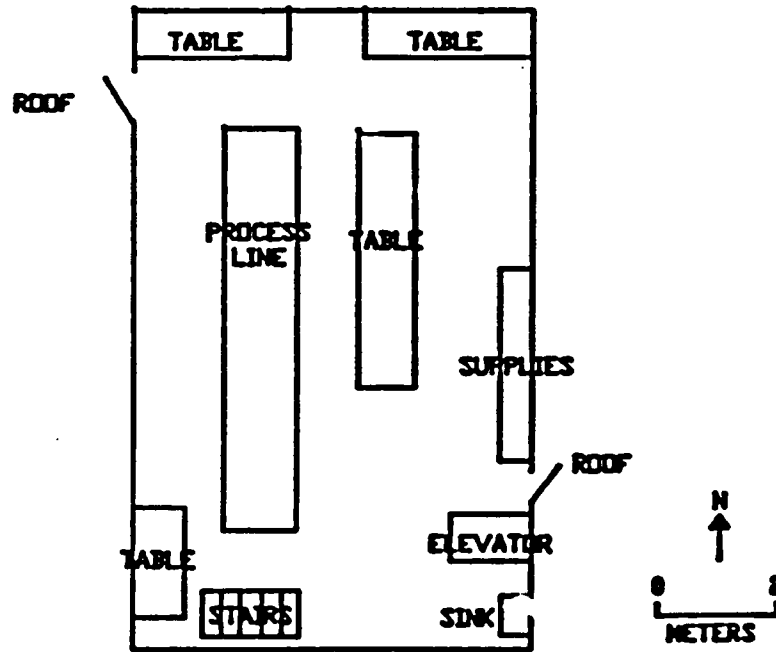


FIGURE 6: Floor Plan of the Sunflame Appliances Facility Penthouse.