

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.

<p>FEDERAL AGENCIES FILE APPLICATIONS WITH:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS WASHINGTON, DC 20555</p> <p>ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:</p> <p>CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION I NUCLEAR MATERIAL SECTION B 631 PARK AVENUE KING OF PRUSSIA, PA 19406</p> <p>ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION II MATERIAL RADIATION PROTECTION SECTION 101 MARIETTA STREET, SUITE 2900 ATLANTA, GA 30323</p>	<p>IF YOU ARE LOCATED IN:</p> <p>ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION III MATERIALS LICENSING SECTION 799 ROOSEVELT ROAD GLEN ELLYN, IL 60137</p> <p>ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION IV MATERIAL RADIATION PROTECTION SECTION 611 RIVERSIDE PLAZA DRIVE, SUITE 1000 ARLINGTON, TX 76011</p> <p>ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION V MATERIAL RADIATION PROTECTION SECTION 1450 MARIA LANE, SUITE 210 WALNUT CREEK, CA 94596</p>
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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.

<p>1. THIS IS AN APPLICATION FOR (Check appropriate item)</p> <p><input type="checkbox"/> A. NEW LICENSE</p> <p><input type="checkbox"/> B. AMENDMENT TO LICENSE NUMBER _____</p> <p><input checked="" type="checkbox"/> C. RENEWAL OF LICENSE NUMBER <u>45-02429-02G</u></p>	<p>2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)</p> <p>MOLINS RICHMOND, INC. P. O. BOX 6159 RICHMOND, VA. 23222</p>
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3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

MOLINS RICHMOND, INC.
3900 CAROLINA AVENUE
RICHMOND, VA. 23222

<p>4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION</p> <p>Philip N. Theurer</p>	<p>TELEPHONE NUMBER</p> <p>(804) 329-9081</p>
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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.

<p>5. RADIOACTIVE MATERIAL</p> <p>a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.</p>	<p>6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.</p>		
<p>7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.</p>	<p>8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.</p>		
<p>9. FACILITIES AND EQUIPMENT.</p>	<p>10. RADIATION SAFETY PROGRAM.</p>		
<p>11. WASTE MANAGEMENT.</p>	<p>12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)</p> <table style="width:100%;"> <tr> <td style="width:60%;">FEE CATEGORY <u>3J</u></td> <td style="width:40%;">AMOUNT ENCLOSED \$ <u>700.00</u></td> </tr> </table>	FEE CATEGORY <u>3J</u>	AMOUNT ENCLOSED \$ <u>700.00</u>
FEE CATEGORY <u>3J</u>	AMOUNT ENCLOSED \$ <u>700.00</u>		

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 25, 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	TITLE	DATE
	Alan C. Palmer	Executive Vice President	9/5/89

a. ANNUAL RECEIPTS		b. NUMBER OF EMPLOYEES (Total for entire facility excluding outside contractors)	c. NUMBER OF BEDS	14. 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)	
<\$250K	\$1M—3.5M			<input type="checkbox"/> YES	<input type="checkbox"/> NO
\$250K—500K	\$3.5M—7M				
\$500K—750K	\$7M—10M				
\$750K—1M	>\$10M				

FOR NRC USE ONLY			
TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS
Ren	Dep 5-II	3J	
AMOUNT RECEIVED	CHECK NUMBER	9003080012 900123	
\$700	056027	REG2 LIC30	
		45-02429-02G PDR	
			APPROVED BY
			DATE
			9/14/89

NRC License Renewal 45-02429-02G

5. **RADIOACTIVE MATERIAL**

As per NRC license no. 45-02429-01

6. **PURPOSE FOR WHICH LICENSED MATERIAL WILL BE USED**

No change.

7. **INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY TRAINING PROGRAM AND THEIR TRAINING AND EXPERIENCE.**

NAME: Philip N. Theurer

TITLE: Senior Project Engineer - Radiation Safety Officer

DEGREE: BSEE Purdue University, 1972

TRAINING: Radiation Safety Principles and Procedures given by Timothy W. Osborne of Radiation Services Organization, July, 1981. This course covered principles and practices of radiation protection, radioactivity measurement standardization and monitoring techniques and instruments, mathematics and calculations basic to the use and measurement of radioactivity, and biological effects of radiation.

Radiation Safety Officer Training given by Timothy Osborne and Mike Terpilak of Radiation Services Organization, March, 1985 (20 hrs). This course covered fundamentals of radioactivity, health risks from exposure, instruments, measurements, and shielding, standards for protection/NRC requirements, scaler counting for leak testing & contamination monitoring, management of radiation accidents, radioactive materials licenses,

NRC License Renewal 45-02429-02G

RSO functions & radiation protection programs, disposal of radioactive materials, and transportation of radioactive materials.

EXPERIENCE: Molins Richmond, Inc.
Richmond, Va.
Jan. 1981 - present
Installation, service, and repair of cigarette density gauges in laboratory and field using Sr90 sealed sources in laboratory and field, radiation surveys and monitoring, wipe testing, and maintenance of records.

NAME: John S. Rains

TITLE: Manager of Electrical/Electronic Engineering

DEGREE: HNC E.E. Woolwich Polytechnic Institute, London, England 1971

TRAINING: Radiation Safety Principles and Procedures given by Timothy W. Osborne of Radiation Services Organization, July, 1981. This course covered principles and practices of radiation protection, radioactivity measurement standardization and monitoring techniques and instruments, mathematics and calculations basic to the use and measurement of radioactivity, and biological effects of radiation.

NRC License Renewal 45-02429-02G

EXPERIENCE: Molins Richmond, Inc.
Richmond, Va.
1976 - present
Installation, service, and repair of
cigarette density gauges in laboratory
and field using Sr90 sealed sources in
laboratory and field, radiation surveys
and monitoring, wipe testing, and
maintenance of records.

NAME: Larry Horn

TITLE: Electronics Technician

DEGREE: A.S. (Electronics) - 1972
B.S. Vocational Ed., Electronics, Southern
Illinois Univ. - 1982

TRAINING: Currently enrolled for 32hr Radation
Safety Officer Training course scheduled
for Sep. 18 - 22 presented by NUS
Corporation of Gaithersburg, Md. This
course will cover basic radiation
protection concepts and theory, exposure
reduction methodology, radiation
measurement applications, license and
regulatory requirements, and industry
source handling experience.

EXPERIENCE: Molins Richmond, Inc.
June, 89 - present
Installation of cigarette density gauges,
surveys of installed gauges, and wipe
tests using Sr90 sealed sources.

NRC License Renewal 45-02429-02G

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

No change.

9. FACILITIES AND EQUIPMENT

No change.

10. RADIATION SAFETY PROGRAM

No change

MOLINS

Machine Company Inc

RECEIVED

Richmond Division

3900 Carolina Avenue
P. O. Box 16008
Richmond, Virginia 23222

Telephone: 804-329-5081
Telex: 0827431
Cables: Molinismo, Richmond, Va.

Our Reference

1980 FEB 28 AM 10 55

Your Reference

U.S. NUCLEAR REG
COMMISSION
MAIL SECTION

February 20, 1980

Radioisotope Licensing Branch
Division of Fuel Cycle & Material Safety
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

*June 81-1
S ↓ D*

RECEIVED BY LFMS	
Date	MAR 3 1980
Log	request # 2 (hand)
By	<i>Jacobson</i>
Orig. To	
Action Compl	3/4/80

Dear Sirs:

Materials License No. 45-02429-01
Materials License No. 45-02429-02G ✓

Enclosed are two copies of request for amendments to the licenses listed above to allow us to distribute the new Molins "MAID N" cigarette density gage and to include installation, service, relocation, and repair of these gages in our licensed activities.

Two copies each of the following drawings are enclosed.

Drawing No. 99766-613 Outline of "MAID N" Scanning Head
Drawing No. 39186-300 Sheets 1 and 2 Radioactive Source
Radiation Contour RC 27
Radiation Contour RC 22
Drawing No. 31113-346 Radiation Warning Label
Drawing No. 99766-176 Radiation Warning Label

General construction and assembly of the unit is illustrated by Drawing No. 99766-613. This drawing also illustrates the "on-off" mechanism and indicator.

The unit uses one 25 millicurie Strontium 90, sealed source type SIF-Q 2874/X117 manufactured by the Radio Chemical Centre, Amersham, Bucks, England. This source type was approved for use in Molins' MODIC gages by amendment to our materials licenses August 9, 1978. Drawing No. 39186-300, sheets 1 and 2 illustrate specification and construction of the sealed source.

Applicant	
Check No.	028458 (Check total \$340)
Amount Paid	\$230.73
Type of	Amendment
Date Check	3/3/80
Received By	Jacobson

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INSPECTION AND ENFORCEMENT

02895

Radioactive Licensing Branch
February 20, 1980
Page 2

Radiation dose levels for the Molins' "MAID N" scanning unit are shown on Radiation Contour RC 27. It may be observed by comparison with RC 22 (MODIC) that the radiation levels are either equal to, or in most positions significantly lower than those of the "MODIC" using the same type of source.

Reduced stray radiation is achieved by use of stainless steel for the source and ionization chamber blocks, whereas these blocks were made from aluminum alloy in the "MODIC."

Warning labels as required by U.S.N.R.C. regulations are fitted to the outer lead/steel cover as shown on Drawing No. 99766-613. Details of the labels are shown on Drawing Nos. 31113-346 and 99766-613. Please note that Drawing No. 31113-346 is being up-dated to change the letters "A.E.C." to "N.R.C." (4 places) and to change the words "ATOMIC ENERGY COMMISSION" to "NUCLEAR REGULATORY COMMISSION." Warning labels on the units will be to the up-dated wording.

Our check in the amount of \$340.00 to cover fees for processing these amendments is enclosed.

We thank you in advance for your attention to our request for amendments to our licenses.

Yours truly,

MOLINS MACHINE CO., INC.

E. Harrison, Jr.

E. Harrison, Jr.
Special Projects Engineer

Enclosures: Drawings
(as listed)
Check No. 28458

cc: Mr. D.E.H. North

MOLINS

Machine Company Inc

Richmond Division

3900 Carolina Avenue
P. O. Box 16008
Richmond, Virginia 23222

Telephone: 804-329-9081
Telex: 0827431
Cables: Molinismo, Richmond, Va.

June 23, 1978

Our Reference EGN/jmk
Your Reference

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

Re: By-Product Material License No.
45-02429-02G & 3 Amendments

Dear Sirs:

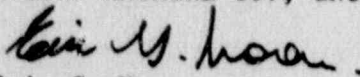
Please find enclosed duplicate copies of application for renewal of the above license due to expire on August 31, 1978.

In accordance with 10CFR170-131-3-G, please find enclosed a check for \$570.00 to cover this transaction.

Your attention is drawn to the fact that Molins Machine Co., Inc. currently has an application for an amendment to the above license, which has been assigned Control No. 94015.

Yours truly,

MOLINS MACHINE CO., INC.


Eric G. Noon

encls. License Renewal application (2)
Facilities Sketch (1)
Check for \$570.00 (1)

**COPIES SENT TO OFF. OF
INSPECTION AND ENFORCEMENT**

95262

UNITED STATES ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1 (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital, person, etc. Include ZIP Code.)

Molins Machine Company, Inc.
3900 Carolina Avenue
Richmond, Virginia 23222

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1 (a). Include ZIP Code.)

As in 1.(a) and also at various customers' plants in the states of Georgia, Kentucky, North Carolina and Virginia.

2 DEPARTMENT TO USE BYPRODUCT MATERIAL

Stock Department

3 PREVIOUS LICENSE NUMBER(S) (If this is an application for renewal of a license, please indicate and give number.)

30-8/78
Renewal 45-02429-02G and 3 amendments.

4 INDIVIDUAL USER(S) (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)

Eric George Noon
Edmund Harrison, Jr.

5 RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)

Same as 4

6 (a) BYPRODUCT MATERIAL (Elements and mass number of each.)

Strontium 90
All Source Types

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLCURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)

Sealed sources supplied by the Radio-Chemical Center, Amersham Bucks., England. The following types are composed of Strontium Titanate embedded in ceramic material and are mounted in sealed source holders:

Amersham Code	SIF-7	.....	2	Millicuries	Each
"	"	SIF-10	.....	4	"
"	"	SIF-K142	.....	20	"
"	"	SIF-K262	.....	1	"
"	"	SIF-W513	.....	25	"

Total holdings not to exceed 800 Millicuries.

RECEIVED BY LFMB

Date 6/29/78
Log June 28-9 Rev
By [Signature]
Orig. To [Signature]

7 (a) DESCRIBE BRIEFLY HOW EACH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. (If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

For storage and use in Molins Machine Co. cigarette density gages as follows:

MARK 8 Gages: Model SIF-7 used in balance unit.
Model SIF-10 Used in scanning unit.

MODIC gages: Model SIF-K142 used in scanning unit.
Model SIF-K262 used in balance unit.
Model SIF-W513 used in scanning unit.

Applicant.....
Check No. 018707
Amount/Fee Category \$570-38
Type of Fee Renewal
Date Check rec'd. 6/29/78
Received By Jackson

95262

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

B. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	AS PER ORIGINAL APPLICATION AND AMENDMENTS		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

9. EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
AS PER ORIGINAL APPLICATION AND AMENDMENTS				

10. RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm ²)	USE (Monitoring, surveying, measuring)
Nuclear Measurements Corp. Model DS-3 Scaler w/NCA LWAA Geiger tube	1	Beta	Maximum Count rate 10 ⁷ C/min.	1.58 mg/cm ²	Source leak tests
Victoreen Model 493	1	Alpha/Beta/Gamma	0.5-5.0-50 mr/hr	1.4 mg/cm ²	Radiation surveys & monitoring
Victoreen Model 489-35 Alpha/Beta/Gamma probe	1	Alpha/Beta/Gamma	0.5-5.0-50 mr/hr	1.5 mg/cm ²	Radiation surveys & monitoring
Universal Atomic Model #700 Survey Meter	1	Alpha/Beta/Gamma	0.5-5.0-50 mr/hr		

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE. Scaler is calibrated with internal counter and by use of certified check source quarterly. Survey meters returned to manufacturer for recalibration yearly and checked with check source each use.

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)
Film badges, body type, supplied by ICN Pharmaceuticals, Inc. Changed monthly.

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No **As per original application except that laboratory facility has been relocated as per attached sketch.**

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.
Same as per original application.

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved. **Radio-Chemical Centre, Amersham, Bucks., England and Nuclear Engineering Co., Inc., Louisville, Kentucky.**

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date June 23, 1978

By: MOLINS MACHINE COMPANY, INC.
Applicant named in item 1

D. E. H. North
President - Richmond Division
Title of certifying official

WARNING.— 18 U. S. C., Section 1001; Act of June 25, 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.

MOLINS
Machine Company Inc

Richmond Division

3900 Carolina Avenue
P. O. Box 16008
Richmond, Virginia 23222

Telephone: 804-329-9081
Telex: 0627431
Cables: Molinismo, Richmond, Va.

Our Reference

Your Reference

April 5, 1978

Radioisotope Licensing Branch
Division of Fuel Cycle and Material Safety
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sirs:

Byproduct Material License No. 45-02429-01
Byproduct Material License No. 45-02429-02G

Please find enclosed two copies of request for amendments to the licenses listed above to include Amersham sealed sources types SIF-Q 2874, containing 25 millicuries of Strontium 90, and SIF-V184, containing 1 millicurie of Strontium 90.

Both types of sources are manufactured by the Radiochemical Centre, Amersham, Bucks, England.

Intended use is in our "MODIC" cigarette density gages.

The Radiochemical Centre wish to discontinue production of existing source types SIF-W513 and SIF-K262, which we are now supplying with our MODIC gages, and to supply instead a more modern form of construction.

The improved types have the same activities and external dimensions as the existing types and are directly interchangeable with them.

Construction of Source Type SIF-Q2874 is illustrated by the attached drawings No. ARC 10457/S and No. 99741-709.

ARC 10457/S illustrates construction of the sealed source capsule as supplied by the Radiochemical Centre to Molins, Limited. Note that this construction consists of Strontium 90 (the chemical form is Strontium Carbonate) incorporated in the glazed surface of an alumina ceramic pellet sealed in a welded stainless steel inner capsule. This inner capsule is enclosed in an outer capsule of welded stainless steel construction. Inner and outer capsules have separate windows of stainless steel, welded to the capsule bodies by argon arc process.

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This source assembly is designated Type X117 by the Radiochemical Centre. We understand that this source construction is recognized by the U.S.N.R.C. as Type SIF 1177.

Molins Limited place the sealed capsule in an outer stainless steel capsule having a titanium window and a heavy metal closure plug, ref drawing no. 99741-709. Labelling is as shown on 99741-709, and consists of an anodized aluminum alloy plate having gold background and magenta radiation symbol.

The enclosed Certificate of Radioactive Source Integrity QCS 185 gives results of tests per British Standard 5288 and Draft International Standard ISO 2919.

Quality control during manufacture consists of leak test of the completed inner capsule before being assembled into the outer capsule; this test must yield less than .005 micro-curie of active material.

Construction of Source Type SIF-V184 is illustrated by the attached drawing no. 99741-710. Strontium 90 in the chemical form of Strontium Titanate is fused into the face of a strontium titanate ceramic pellet. This pellet is sealed into a welded stainless steel inner capsule, which is housed in a welded stainless steel outer capsule. Inner and outer capsules have separate stainless steel windows, argon arc welded to the respective capsule bodies. Labelling is as shown on drawing no. 99741-710 and consists of an anodized aluminum alloy plate having gold background and magenta radiation symbol. The plate is attached to the outer source holder with drive screws.

The inner capsule is designated XN38 and is approved under GB 172S, copy enclosed. Also enclosed is Certificate of Radioactive Source Integrity No. QC S192 which gives results of tests per British Standard 5288 and Draft International Standard ISO 2919.

Quality control during manufacture consists of leak test of the completed inner capsule; this test must yield less than .005 micro-curie of active material.

We are enclosing our check in the amount of \$80.00 to cover cost of processing these amendments.

Please do not hesitate to call us at 804-329-9081 if additional information is required.

Yours truly,

MOLINS MACHINE COMPANY, INC.

E. Harrison, Jr.

E. Harrison, Jr.

94015

Radioisotope Licensing Branch
U. S. Nuclear Regulatory Commission

Page 3

Enclosures: Drawing No. 99741-709)
99741-710) 2 each
ARC 10457/S)

GB/172/S

QCS 185

QCS 192

Quality Control Data

Check in the amount of \$80.00

MOLINS
Machine Company Inc

Tobacco Machinery Division

3901 Carolina Avenue

P O Box 16008

Richmond, Virginia 23222

Telephone: 703 649-9081

Telex: 0827431

Cables: Molmimo, Richmond, Va.

February 22, 1971

Our Reference EGN/ms

Your Reference

U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C. 20545

Dear Sirs,

Please find enclosed two copies of an application for amendments to our Byproduct Material Licenses

45-02429-01/
45-02429-02 G

This is to enable us to handle our new "MODIC" Cigarette Density Gage.

Enclosed also are one complete set of drawings of the equipment together with a copy of the Radiation Isodose Contours. We would appreciate receiving prompt attention to this application, so that we may put this equipment into operation.

Yours very truly,

MOLINS MACHINE COMPANY, INC.

Eric G. Noon

Eric G. Noon
Electronics Engineer

EGN/ms

Encls:

cc: Mr. T. O. Chewing

20429

Apple

MOLINS

Machine Company Inc

February 22, 1971

List Of Drawings For Modic Weight Control

20000-591		31642-420
31038-401		31642-480
31041-091		31642-490
31091-592		31642-500
31094-534		31642-580
31094-544		31642-590
31111-961	to 980	31642-610
31112-781		31642-670
31115-001	to 020 (Sheets 1 & 2)	31642-681
31115-223		31642-691
31311-071		31642-700
31315-471		31642-710
31316-021		31643-971
31382-411		31652-220
31599-750		31660-170
31599-950	to 999	98025-061
31018-140		98025-074
31629-941		98030-790
31631-540		15663-A
31631-550		34112
31631-570		34115-A
31635-050		34209
31635-550		34209-B
31635-500		34210
31635-570		34211
31635-590		34496-A

Form AEC-313
9-64
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 38-8027

INSTRUCTIONS.— Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital, person, etc. include ZIP Code)		(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1(a). Include ZIP Code)	
Molins Machine Co., Inc. 3901 Carolina Avenue Richmond, Virginia 23222		As in 1(a) and at various customer's plants in Virginia and the agreement states of North Carolina and Kentucky	
2. DEPARTMENT TO USE BYPRODUCT MATERIAL Stock Department		3. PREVIOUS LICENSE NUMBER(S) (If this is an application for renewal of a license, please indicate and give number.) 45-02429-01) Amendments requested for 45-02429-02) equipment listed below	
4. INDIVIDUAL USER(S) (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.) Eric George Noon Edmund Harrison, Jr.		5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.) Eric George Noon	
6. (a) BYPRODUCT MATERIAL (Elements and mass number of each) Strontium 90/ Yttrium 90		(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.) Sealed Sources supplied by: Radio-Chemical Centre, Amersham Bucks, England Amersham Code S.I.F. K 401 0.5 millicuries each S.I.F. K 264 4.0 millicuries each Chemical Form of Above Types:- Titanate, Embedded in Ceramic Total Holdings: 40 Sources, not to exceed 90 millicuries	
7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.) For storage and used in Molins Machine Company cigarette Density Gages, as follows:- SIF K 401) SIF K 264) One of each source, used in Molins Double Ionisation Chamber Weight Controller referred to as 'MODIC' Controller.			

28429

*No telephoned Feb. 25, 1963
for quote action.
Telephone requested Feb 26, 1963
O.K. amount later*

FEBRUARY 15, 1963

UNITED STATES ATOMIC ENERGY COMMISSION
DIVISION OF LICENSING AND REGULATION
WASHINGTON 25, D. C.

ATTN: MR. WILLIAM O. MILLER, SENIOR LICENSING REVIEWER

GENTLEMEN:

RE: APPLICATION FOR AMENDMENT OF OUR
BYPRODUCT MATERIAL LICENSE GL104(I63)

IN CONNECTION WITH OUR MARK 6 CIGARETTE DENSITY GAGE WHICH IS CURRENTLY LICENSED FOR THE USE OF RADIO CHEMICAL CENTRE SEALED SOURCES MODELS SIF-1 AND SIF-2 WITH RESPECTIVE STRONTIUM 90 STRENGTHS OF 2 AND 5 MILLI-CURIES, IT IS NOW OUR INTENTION TO REPLACE THE 5 MILLI-CURIES SCANNING HEAD SOURCE SIF-2 WITH A 4 MILLI-CURIES SOURCE AMERSHAM CODE SIF-10 WHICH IS OTHERWISE MECHANICALLY INTERCHANGEABLE. ALTHOUGH RADIATION WILL BE LESS BY THE USE OF THIS 4MC SOURCE INSTEAD OF 5MC, WE PROPOSE TO LET THE EXISTING ISODOSE CURVES NOW IN YOUR POSSESSION APPLY.

THEREFORE, WE HEREBY APPLY FOR AMENDMENT TO OUR BYPRODUCT MATERIAL LICENSE No. GL104(I63) TO INCLUDE THIS ADDITIONAL 4MC SOURCE FOR WHICH WE ENCLOSE THE FOLLOW DETAIL AND ASSEMBLY DRAWINGS NOS. ARC 1608, 98009-679, 98009-754, 98008-525, 98009-678, 98008-530, 98008-531 AND 98009-598.

PLEASE GIVE THIS APPLICATION YOUR VERY EARLIEST POSSIBLE ATTENTION AS WE WANT TO BRING ONE OF THESE SIF-10

CONT'D. . . .

UNITED STATES ATOMIC ENERGY COMMISSION

FEBRUARY 15, 1963

SOURCES IN FOR TRIAL IN ABOUT TWO TO THREE WEEKS IF WE
CAN OBTAIN YOUR APPROVAL.

YOURS VERY TRULY,
MOLINS MACHINE COMPANY, INC.

C. B. ROCKHILL
CHIEF ENGINEER

CBR:MKS

ENCL.

CC: MR. R. W. BECK

UNITED STATES ATOMIC ENERGY COMMISSION
DIVISION OF LICENSING AND REGULATION

Your letter, application, dated 2-15-63

RE: APPLICATION FOR AMENDMENT OF BYPRODUCT MATERIAL LICENSE
- UCLL (163)

Including enclosures
is acknowledged and has been assigned:

Docket No. _____ or Control No. 49526

Please refer to the above number(s) in future correspondence.

Date Feb. 18, 1963

*This is an acknowledgment form only.
It is not a reply to your communication.*

November 26, 1963

U. S. Atomic Energy Commission
Division of Licensing and Regulation
Washington 25, D. C.

Attn: Mr. William O. Miller, Senior Licensing Reviewer

Gentlemen:

R: Application for Amendment of our
Byproduct Material License GL 104 (I65)

In connection with our Mark VIII Cigarette Density Gauge which is currently licensed for use of Radio Chemical Centre Sealed Sources Models SIF-1, SIF-2, and SIF-10 with respective Strontium 90 strengths of 2, 5, and 4 millicuries it is our intention to replace the 2 millicuries Balance Unit source Type SIF-1 with the Radio Chemical Centre Sealed Source Type SIF-7 which is also 2 millicuries strength but of slightly different source holder design.

Therefore, we hereby apply for amendment to our Byproduct Material License No. GL 104(I65) to include this additional 2 millicuries source for which we enclose the following detail and assembly drawings Nos. SA1201-22, 33724-113, 31814-517, 34496-A, 34210, 34115-A, 31681-108, 31401-0-VAR., 31684-161-180, 31682-621-640, 34211, 34209-B, and 38446-102.

Please give this application your earliest possible attention in order that we may bring one of these sources in for trial in two weeks subject of course to your approval.

Yours very truly

MOLINS MACHINE COMPANY, INC.

E. Harrison, Jr.
E. Harrison, Jr.
Engineer

EH/rc
Encl:

Copy Received

Dated: 29 November 1963

*Approved Mailed from AEC
Per W.O. Miller Dec. 11, 1963*

August 6, 1965

United States Atomic Energy Commission
Isotopes Branch, Division of Licensing and Materials
Washington 25, D. C.

Attn: Mr. W. O. Miller

Gentlemen:

Byproduct Material License Renewal Application

Please find enclosed two copies of application for renewal of our Byproduct Material License Number GL 104 (165) including eight Amendments, which expires September 30, 1965.

Yours very truly,

MOLINS MACHINE COMPANY, INC.

E. Harrison, Jr.
Electrical Engineer

EH/ms

cc: Mr. T. O. Chewing
With Copy Of Application

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS.—Complete items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital, person, etc. Include ZIP Code.)		(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1 (a). Include ZIP Code.)	
Molins Machine Company, Inc.		1716 Summit Avenue Richmond, Virginia, 23230	
2. DEPARTMENT TO USE BYPRODUCT MATERIAL		3. PREVIOUS LICENSE NUMBER(S) (If this is an application for renewal of a license, please indicate and give number.)	
Steel Department		GL 104 and 9 Amendments (165)	
4. INDIVIDUAL USER(S) (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in items 8 and 9.)		5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in items 8 and 9.)	
Eric G. Noon Edward Harrison, Jr.		Eric G. Noon	
6. (a) BYPRODUCT MATERIAL (Elements and total number of each.)		(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)	
Strontium 90		Sealed Sources:- Amersham Code SIC-15 20 Milli-curies each SIC-16 15 Milli-curies each SIC-17 5 Milli-curies each SIC-18 2 Milli-curies each Chemical form of above: Carbonate, embedded in Silver. Amersham Code SIF-1 2 Milli-curies each SIF-2 5 Milli-curies each SIF-7 2 Milli-curies each SIF-10 4 Milli-curies each Chemical form of above: Titanate, embedded in Ceramic. Total Holdings: 40 sources of above types, not to exceed 800 Milli-curies. All sources supplied by: Radio-Chemical Centre, Amersham, Bucks, England	
7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED (If byproduct material is for human use, supplement A (Form AEC-312a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)			
For storage, and used in Molins Machine Company Cigarette Density Gages, as follows:- SIC-15 Scanning and Balance Units of MK.2M Gages: Model 1 Short Length Scanning Unit. SIC-16 Scanning and early Balance Units of MK.8 Gages. SIC-17 Early MK.6 Scanning Units and later MK.8 Balance Units. SIC-18 Early MK.6 Balance Units. SIF-1 Later MK.6 Balance Units. SIF-2 Later MK.6 Scanning Units SIF-7 Latest MK.6 and latest MK.8 Balance Units SIF-10 Latest MK.6 and latest MK.8 Scanning Units NOTE:- Model 1 Short Length Scanning Unit use one source only. MK.2M, MK.6 and MK.8 Gages use one source each in Scanning Unit and Balance Unit.			

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

9. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)		FORMAL COURSE (Circle answer)	
			Yes	No	Yes	No
a. Principles and practices of radiation protection			Yes	No	Yes	No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes	No	Yes	No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes	No	Yes	No
d. Biological effects of radiation			Yes	No	Yes	No

10. EXPERIENCE WITH RADIATION (Actual use of radionuclides or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

10. RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm ²)	USE (Monitoring, surveying, measuring)

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE

12. TLM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED (For film badges, specify method of calibrating and processing, or name of supplier.)

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

CERTIFICATE (This form must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date August 6, 1963

Molina Machine Company, Inc.
Applicant named in item 1
 By [Signature]
 Vice President
 Title of certifying official

WARNING.—18 U. S. C., Section 1001; Act of June 25, 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.

December 3, 1963

U. S. Atomic Energy Commission
Division of Licensing and Regulation
Washington 25, D. C.

Attn: Mr. Richard E. Cunningham, Chief
Isotopes Branch

Gentlemen:

Replying to your letter of November 29, 1963, please find enclosed the following drawings:

S.A. 1201-22

31401-O-VAR.	31681-108
34115-A	31682-621 to 640
34209-B	31684-161 to 180
34210	31814-517
34211	33724-113
34496-A	38446-102

Anything you can do to expedite the issuance of the amendment to our license will be greatly appreciated.

Yours very truly,

MOLINS MACHINE COMPANY, INC.

E. Harrison, Jr.
Engineer

EH/MS

Encls:

Air Mail - *Spec. Del.*

P.S. The above prints have been furnished in duplicate as per your instructions.

*Telephone to A.E.C. Dec. 6/1963
in hand by William O. Miller
who will call early next week.
C.H.R.*

August 9, 1967

United States Atomic Energy Commission
Isotopes Branch, Division of Licensing and Materials
Washington 25, D. C.

Attn: Mr. W. O. Miller

Gentlemen:

Byproduct Material License Renewal Application

Please find enclosed two copies of application for renewal of our Byproduct Material License Number GI 104 (167) including eleven Amendments, which expires September 30, 1967.

Yours very truly,

MOLINS MACHINE COMPANY, INC.

E. Harrison, Jr.
Electrical Engineer

EH/ms

cc: Mr. T. O. Chewing
With Copy Of Application

August 9, 1967

United States Atomic Energy Commission
Isotopes Branch, Division of Licensing and Materials
Washington 25, D. C.

Attn: Mr. W. O. Miller

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Please find enclosed two copies of application for renewal of our Byproduct Material License Number GL 104 (167) including eleven Amendments, which expires September 30, 1967.

Yours very truly,

MOLINS MACHINE COMPANY, INC.

E. Harrison, Jr.
E. Harrison, Jr.
Electrical Engineer

EHI/ms

cc: Mr. T. O. Chewning ✓
With Copy Of Application

UNITED STATES ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS. - Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20540 Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the licensee is subject to Title 10, Code of Federal Regulations, Part 20.

<p>1 (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital, person, etc. Include ZIP Code.)</p> <p>Molins Machine Company, Inc.</p>	<p>(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1 (a). Include ZIP Code.)</p> <p>3001 Carolina Avenue Richmond, Virginia 23222</p>
<p>2 DEPARTMENT TO USE BYPRODUCT MATERIAL</p> <p>Stock Department</p>	<p>3 PREVIOUS LICENSE NUMBER(S) (If this is an application for renewal of a license, please indicate and give number.)</p> <p>GL 104 and 11 Amendments (167)</p>
<p>4 INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)</p> <p>Eric G. Noon Edmund Harrison, Jr.</p>	<p>5 RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)</p> <p>Eric G. Noon</p>

<p>6 (a) BYPRODUCT MATERIAL (Elements and mass number of each.)</p> <p>Strontium 90</p>	<p>(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)</p> <p>Sealed Sources:-</p> <p>Amersham Code SIC-15 20 Milli-curies each SIC-16 15 Milli-curies each SIC-17 5 Milli-curies each SIC-18 2 Milli-curies each</p> <p>Chemical form of above: Carbonate, embedded in Silver.</p> <p>Amersham Code SIF-1 2 Milli-curies each SIF-2 5 Milli-curies each SIF-7 2 Milli-curies each SIF-10 4 Milli-curies each SIF-43 4 1/2 Milli-curies each (Double source) SIF-44 8 1/4 Milli-curies each (Double source)</p> <p>Chemical form of above: Titanate, embedded in Ceramic.</p> <p>Total Holdings: 40 sources of above types, not to exceed 800 Milli-curies.</p> <p>All sources supplied by: Radio-Chemical Centre, Amersham, Bucks, England</p>
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7 DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

For storage and used in Molins Machine Company Cigarette Density Gages, as follows:-

SIC-15 Scanning and Balance Units of MK.2M Gages: Model 1 Short Length Scanning Unit.
SIC-16 Scanning and early Balance Units of MK.8 Gages.
SIC-17 Early MK.6 Scanning Units and later MK.8 Balance Units.
SIC-18 Early MK.6 Balance Units.
SIF-1 Later MK.6 Balance Units.
SIF-2 Later MK.6 Scanning Units.
SIF-7 Latest MK.6 and latest MK.8 Balance Units
SIF-10 Latest MK.6 and latest MK.8 Scanning Units
SIF-43 } Either type used with Molins Scintillation Counter Weight Control.
SIF-44 }

NOTE:- Model 1 Short Length Scanning Unit use one source only. MK.2M, MK.6 and MK.8 Gages use one source each in Scanning Unit and Balance Unit.

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

B. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	As in original application.		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

9. EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

10. RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm ²)	USE (Monitoring, surveying, measuring)
As in original application.					

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.
As in original application.

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)
As in original application.

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

- 13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No As in original application
- 14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source. As in original application
- 15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date August 9, 1967

Molins Machine Company, Inc.
 Applied for in Item 1
 By: *J. J. Shewring*
 Vice President
 Title of certifying official

WARNING.— 18 U. S. C., Section 1001; Act of June 25, 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.

EGN:1wm

July 6, 1972

U.S. Atomic Energy Commission
Materials Branch, Division of Materials Licensing
Washington, D.C. 20545

Attention: Mr. Jack M. Bell

Dear Sirs:

Application for Renewal of Byproducts
Material License - No. 45-02429-02G

Please find enclosed original and one copy of application for renewal of our byproduct material license No. 45-02429-02G, and 1 amendment, which expires August 31, 1972.

We request amendment to delete certain source models because we no longer use those source models or equipment under this license. The source models that we request to be deleted are as follows:

Model SIC-15, 20 millicuries, used in scanning and balance units on Mark 2H gages and in the Model 1 Short Length Scanning Unit.

Model SIC-17, 5 millicuries, and Model SIC-18, 2 millicuries, used in Mark 6 scanning and balance units, respectively.

Model SIF-2, 5 millicuries, and Model SIF-1, 2 millicuries, used in Mark 6 scanning and balance units, respectively.

Model SIC-16, 15 millicuries, and Model SIC-17, 5 millicuries, used in Mark 8 scanning and balance units, respectively.

U.S. Atomic Energy Commission
Page 2
July 6, 1972

Model SIF-44, 8 and 4 millicuries, (in single holder) used in Scintillation Counter Weight Control scanning and balance unit.

Model SIF-43, 4 and 2 millicuries, (in single holder) used in Scintillation Counter Weight Control scanning and balance unit.

Please note that the information required in Items 8 through 15 of the application has been covered in our previous applications and remain unchanged.

Yours truly,

NOLINS MACHINE COMPANY, INC.

EA

E. Harrison, Jr.
Chief Engineer

Enclosures

cc: Mr. T. O. Chewing

Form AEC-313
(8-64)
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 38-R0027

INSTRUCTIONS — Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT (Institution, firm, hospital, person, etc. Include ZIP Code.)
**Molins Machine Co., Incorporated
3901 Carolina Avenue
Richmond, Virginia 23222**

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED (If different from 1(a). Include ZIP Code.)
As in 1.(a) and also at various customer's plants in the states of Virginia, North Carolina, and Kentucky

2. DEPARTMENT TO USE BYPRODUCT MATERIAL
Stock Dept.

3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)
Renewal 45-02429-02G and 1 amendment

4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)
**Eric George Moon
Edmund Harrison, Jr.**

5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)
Same as 4

6. (a) BYPRODUCT MATERIAL (Elements and mass number of each.)
**Strontium 90
All Source Types**

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)
**Sealed sources supplied by Radio-Chemical Center, Amersham Bucks, England
All models are Strontium Titanate embedded in ceramic material and are mounted in sealed source holders.
Amersham Code SIF-10-4-4 Millicuries Each
" " SIF-7-2-2 " "
" " SIF-K-264-4 " "
" " SIF-K-401-0.5 " "
" " SIF-K-142-20 " "
" " SIF-K-262-1 " "**

Total holdings requested: 40 sources not to exceed a total of 800 millicuries

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored.)
For storage and use in Molins Machine Co. Cigarette Gages as follows:

**Mark 8 gages : Model SIF-7 used in balance unit
Model SIF-10 used in scanning unit
Modic gages: Model SIF-K264 used in scanning unit
Model SIF-K401 used in balance unit
or
Model SIF-K142 used in scanning unit
Model SIF-K262 used in balance unit**

Total holdings requested: 40 sources not to exceed a total of 800 millicuries

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

B. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)		FORMAL COURSE (Circle answer)	
			Yes	No	Yes	No
a. Principles and practices of radiation protection						
b. Radioactivity measurement standardization and monitoring techniques and instruments						
c. Mathematics and calculations basic to the use and measurement of radioactivity						
d. Biological effects of radiation						

9. EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

10. RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm ²)	USE (Monitoring, surveying, measuring)

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No
14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.
15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

Radio Chemical Centre, Amersham, Bucks, England Return to supplier viz:

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date July 6, 1972

Molins Machine Company, Inc.
Applicant named in item 1
By: [Signature]
Vice-President
Title of certifying official

WARNING.— 18 U. S. C., Section 1001, Act of June 25, 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.

EH/fg

September 20, 1973

U.S. Atomic Energy Commission
Materials Branch
Directorate of Licensing
Washington, D. C. 20545

Attention: Mr. Jack M. Bell

Dear Sirs:

Byproduct Material Licenses
Nos. 45-02429-01 & 45-02429-02G

We request amendments to the aforementioned licenses as follows:

Please amend License No. 45-02429-01 to authorize possession and use of Amersham Sealed Sources Radiochemical Centre types SIFK-142, SIFK-262, and SIF-W513 in our MODIC Gauges. Information describing construction and use of Sources Models SIFK-142 and SIFK-262 is on file in your office and information pertaining to Source Model SIF-W513 is included with this request.

Please amend License No. 45-02429-02G to authorize distribution of Source Model SIF-W513 for use in our MODIC Gauges. Sources Models SIFK-142 and SIFK-262 are authorized by earlier amendment to this license.

Details of construction of Source Model SIF-W513, its adaptation to the MODIC Scanning Unit, and Isodose Contours are enclosed with this request. A general description of the MODIC Scanning Unit with Source Model SIF-W513 is also included.

COPY

U.S. Atomic Energy Commission
September 20, 1973
Page 2

Please let us know if you require additional information.

We thank you in advance for your attention to our requests for amendments.

Yours truly,

MOLINS MACHINE COMPANY INC.

E. Harrison, Jr.

E. Harrison, Jr.

Enclosures:

Drawing CRC 10233/S
Drawing SK-1-139
Drawing 31667-710 to 719
Drawing CRC 10232/S
Drawing 98050-205
Drawing SK-1-138
Drawing 41205-950 to 999
Drawing 99921-323
Drawing 31691-690
Drawing 99916-970

Radiat: 1 Measurements on Machine

Radiation Measurements of Scanning Unit Away from Machine

Description "Application for AEC Approval"

cc: Mr. T. O. Chewing
A.E.C. License File

MOLINS

Machine Company Inc

Richmond Division

3900 Carolina Avenue
P. O. Box 16008
Richmond, Virginia 23222

Telephone: 804-329-9081
Telex: 0827431
Cables: Molinismo, Richmond, Va.

Our Reference

Your Reference

January 19, 1984

**Licensing Branch
Division of Fuel Cycle and Material Safety
Office of Nuclear Material and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C., 20555**

**Re: By-Product Materials License No. 45-02429-02G
and 6 amendments.**

Dear Sirs:

We request renewal of the aforementioned license pursuant to your notice dated Dec. 1, 1983.

We wish to make the following changes:

- 1.) Under condition 10 of the license, delete the Mark 6 gauge as this device is obsolete and no longer in use.
- 2.) Under condition 18 of the license, delete reference to correspondence dated June 25, 1962. This letter requested the addition of the Mark 6 gauge and a source type, SIC-18, which was deleted in a renewal application dated July 6, 1972.
- 3.) Under condition 18 of the license, delete reference to correspondence dated Aug. 3, 1962. This letter requested the addition of source types SIF-1 and SIF-2 also deleted by renewal application dated July 6, 1972.
- 4.) Under items 4 and 5 of renewal application dated June 23, 1978, delete Edmund Harrison, Jr. and add Philip N. Theurer (two copies of supporting resume enclosed).
- 5.) Under item 10 of renewal application dated June 23, 1978, change number of Victoreen Model 493 available from 1 to 2, delete Victoreen Model 489-35 Alpha/Beta/Gamma probe, add Victoreen Model 491-40 Beta/Gamma probe, add Victoreen Model 471 survey meter, and delete Universal Atomics model #700 survey meter (two copies of additional information enclosed).

January 19, 1984

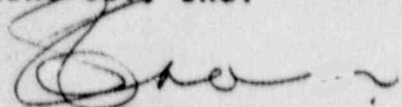
- 6.) Under item 11 of renewal application dated June 23, 1978, survey meters are now calibrated every 6 mo. by Radiation Service Organization, 5204 Minnick Rd., Laurel, Md. 20707. RSO is licensed by the state of Maryland to calibrate radiation survey instruments (Maryland license no. MD-33-021-01). The calibration procedures of RSO have been reviewed by the NRC and are on file with the Medical and Academic Section, Material license Branch. RSO is carried on their list of approved consultants.
- 7.) Under item 13 of renewal application dated June 23, 1978, the laboratory facilities have been relocated as per two copies of enclosed sketches.

Condition 18 of our license references letters dated Aug. 8, 1963, June 14, 1971, Aug. 18, 1971, Aug. 6, 1972, and Oct. 16, 1972. We are unable to locate these documents in our files. In a call to the License Branch File Room Jan 5, 1984 the clerk was unable to locate copies of these letters in the license file. Since we are unable to determine the contents of these documents we respectfully request that they be deleted from condition 18. If in reviewing the license renewal any or all of the documents are found, please provide us with copies and we will advise you of how they may reflect upon our current program.

We will continue to operate in accordance with the following documents listed in condition 18: Feb. 15, 1963, Nov. 26, 1963, Aug. 6 1963, (received with letter dated Aug. 5 1965), Dec. 3, 1963, Aug. 9, 1967, Feb. 22, 1971, July 6, 1972, Sep. 20, 1973, Apr. 5, 1978, June 23, 1978, Feb. 20, 1980, Jan. 5, 1981, and Mar. 3, 1981.

In accordance with 10CFR170.31-3-G, please find enclosed a check for \$570 to cover this renewal. Any questions regarding this renewal may be directed to Philip N. Theurer at 804-329-9081.

Yours truly,
Molins Machine Co., Inc.


D. E. H. North - President

DEHN/pnt

ENC. Copies of letter (2)
 Renewal Application (2)
 Resume of P.N. Theurer (2)
 Instrumentation detail (2)
 Facilities sketch (2)
 Renewal fee check (1)

10. RADIATION DETECTION INSTRUMENTS

a.

TYPE: Survey meter probe
MANUFACTURE: Victoreen
MODEL: 491-40
NO. AVAIL.: 2
RADIATION: Beta/Gamma
DETECTED
WINDOW: 30mg/cm²

b.

TYPE: Survey Meter
MANUFACTURE: Victoreen
MODEL: 471
NO. AVAIL.: 1
RADIATION: Alpha/Beta/Gamma/X-ray
DETECTED
SENSITIVITY: 1.0 - 3.0 - 10 - 30 - 100 - 300 mR/hr and R/hr (rate)
RANGE 1.0 - 3.0 - 10 - 30 - 100 - 300 mR/hr (integrate)

16. FORMAL TRAINING IN RADIATION SAFETY

NAME: Philip N. Theurer
TITLE: Project Engineer
DEGREE: BSEE Purdue University, 1972
TRAINING: Radiation Safety Principles and Procedures
given by Timothy W. Osborne of Radiation
Services Organization, July, 1981
This course covered principles and practices of
radiation protection, radioactivity measurement
standardization and monitoring techniques and
instruments, mathematics and calculations basic to
the use and measurement of radioactivity, and
biological effects of radiation.

17. EXPERIENCE

MOLINS MACHINE CO., INC.
RICHMOND, VA.
JAN. 1981 - JAN. 1984

Installation, service, and repair of cigarette density
gages in laboratory and field using Sr90 sealed sources
in laboratory and field, radiation surveys and monitoring,
and maintenance of records.

MOLINS
Machine Company Inc

RECEIVED

Richmond Division

3900 Carolina Avenue
P. O. Box 16006
Richmond, Virginia 23222

Telephone: 804-329-9081
Telex: 0827431
Cables: Molinismo, Richmond, Va

Our Reference

Your Reference

MAR 9 AM 10 39

U.S. POSTAL REG.
COMMISSION
AIR MAIL SECTION

March 3, 1981

United States Nuclear Regulatory Commission
Material Certification and Procedures Branch
Division of Fuel Cycle and Material Safety
Mail Stop 396 SS
Washington, D.C. 20555

Attn: Mr. Mark L. Au

Gentlemen:

Ref: Control No. 80-49

Further to our telephone conversation of February 9, 1981 and Mr. Earl G. Wright's letter of February 17, 1981 we enclose two copies of the report covering tests of the Molins MAID N Scanning Unit explaining classification of the unit under American National Standard N538-1979.

We sincerely hope that information contained in the report will enable you to complete your evaluation of the unit.

Sincerely,

MOLINS MACHINE COMPANY, INC.

E. Harrison, Jr.
E. Harrison, Jr.

Enclosure: 2 Copies of Report

cc: Mr. D. E. H. North

CLASSIFICATION OF THE MOLINS MAID-N SCANNING UNIT IN
ACCORDANCE WITH AMERICAN NATIONAL STANDARD N 538

INTRODUCTION:

The objective of this report is to clarify why we believe the MAID-N Scanning Unit should be classified according to the designation:

ANSI-33-685-685-R2

The device safety performance classification and associated test procedures are at least equivalent to the minimum requirements of American National Standard N538-1979, as detailed in sections 6 and 7 of N.B.S. Handbook 129. All paragraph references quoted in this report are from N.B.S. Handbook 129.

6.1.1. CLASSIFICATION DESIGNATION:

6.1.1 Temperature Range:

The first two digits of the designation (33), identifies the temperature range of 0°C to 60°C within which the device could be used under extreme conditions. The safety features, stray radiation and source integrity have therefore been checked at these temperature limits as detailed in section 7.2. In practice, however, the working temperature would normally be in the range 20°C to 45°C.

6.1.1 Stray Radiation - Source ON Condition:

The second set of digits (685) identifies the performance for stray radiation in the source ON condition (Shutter Open) when the Scanning Unit is mounted on a cigarette making machine with the source shutter open and with cigarette rod present in the device, as shown in Radiation Contour RC30. The digits 685 were in fact, determined from the maximum stray radiation levels shown in RC29 at 5cm, 30cm and 100cm, but ignoring the radiation levels on the cigarette rod axis. The radiation levels on the cigarette rod axis of RC29 are measurements of beta radiation with the source shutter open and with no cigarette rod present. Whereas, no significant level of beta radiation exists elsewhere on RC29, the remaining measurements are of bremsstrahlung radiation and are identical to those in RC28 with the source shutter closed.

In normal operation, the region defined by the cigarette rod axis is not accessible to the operator, due to the presence of cigarette rod, which is the only condition under which the source shutter can be continuously open. Also, under these conditions, any accessible residual beta radiation external to the device is attenuated to an insignificant level (see RC30).

The only condition under which the high beta radiation levels on the cigarette rod axis are accessible to the operator, is immediately after the machine is started and just prior to the cigarette rod entering the Scanning Unit, when for calibration purposes, the source shutter is automatically opened for a controlled period of six seconds. During operation of a cigarette making machine, this condition occurs on average once per hour, or less frequently if the process is running well. In practice, no part of the operator's body would be in the high radiation region, as he would be involved in other functions of the process during the automatic calibration sequence.

The calibration sequence cannot be manually initiated by the machine operator. Manual initiation of the sequence by means of a push-button on the MAID-N control panel is however, available to licensed personnel, but this function is protected by two keys; one for opening the rear door of the MAID-N control cabinet and the other for operating a key-switch to select the 'maintenance' mode. The rear door cannot be closed until the 'maintenance' mode is cancelled and its key removed. The maintenance mode enables the licensed person to initiate the calibration sequence by pressing a button. Under this condition, the source shutter opens for a controlled period of nine seconds. Cigarette rod density measurement and machine operation cannot be performed while the MAID-N is in the 'maintenance' mode.

It is worth noting that the 'Health and Safety Executive' department responsible for nuclear installations in the U.K. (British equivalent to N.R.C.) examined the above calibration features

of the MAID-N in great detail before issuing an 'Exemption Certificate,' copies of which were handed to Messrs. Au & Wright of the U.S.N.R.C. on 11 December 1980.

6.1.1 Stray Radiation - Source OFF Condition:

The third set of digits (685) identifies the performance for stray radiation in the source OFF condition (shutter closed) as shown in Radiation Contour RC28. In this condition, no beta radiation exists at the 5cm, 30cm and 100cm contours. All measurements are of bremsstrahlung radiation. It can be seen from RC28 that at no point on the 5cm, 30cm and 100cm contours, does the stray radiation exceed the 5m rem/h, 0.25m rem/h and 0.25m rem/h respective limits for designation 685.

RC27 also shows the stray radiation level on the surface of the Scanning Unit and at 10cm from the surface.

6.1.1 Type of Source:

The letter 'R' identifies the source as a radioactive source. The source consists of 25 mCi of Strontium-90 in a sealed capsule, type SIF Q2874, to American National Standard classification ANSI 77 C64343.

6.1.1 Fire Accident Condition:

The last digit (2) identifies the fire accident condition at 538°C (1000°F) for five minutes. This designation was agreed with U.S.N.R.C on 11 December 1980 as being appropriate for a cigarette machinery application.

6.2 Other Conditions:

6.2.1 Other Potential and Accident Conditions:

- (a) Corrosion is not considered to be a problem, as the radioactive source itself is of the double encapsulation type and is covered by ANSI 77 C64343. In addition, the Scanning Unit components immediately surrounding the source capsule, and the source

shutter are manufactured from stainless steel. Any corrosive constituents of the cigarette manufacturing process would not affect the components.

- (b) Vibration encountered on a cigarette machine would not constitute a safety hazard. Experience in the application of the MAID-N Scanning Unit has also shown this to be the case.
- (c) Impact - not applicable.
- (d) Puncture - virtually impossible, due to the non-accessibility of the source within the Scanning Unit.
- (e) Compressive Loads - not applicable.
- (f) Explosion - The cigarette manufacturing process does not involve explosive materials.
- (g) Flooding - not applicable.
- (h) Distance to Work Stations - The operator is normally in a standing position at an average distance of one metre from the Scanning Unit.
- (i) Personnel Occupancy Times - Already considered under 6.1.1 - Source ON Condition.
- (j) Maintenance is partly considered under 6.1.1 - Source ON Condition (manual initiation of calibration sequence by licensed personnel.) Other procedures, only to be conducted by licensed personnel, are detailed in the equipment handbook and involve such procedures as: replacing an ionisation chamber, fitting the source and fitting the Scanning Unit to the cigarette making machine.

6.2.2 Other Features Considered for Evaluation:

- (a) Loss of activity is virtually impossible with this type of radioactive source and its encapsulation. Statutory wipe tests would reveal any minimal loss of activity.
- (b) The quantity of radioactive material used is necessary to achieve the desired measuring performance of the gauge. 25 mCi of Strontium-90 is not an excessive quantity for this type of application.

- (c) Radiotoxicity of the source material is high, but the sealed construction around a strontium-90 titanate/ceramic pellet renders it harmless during normal use.
- (d) See (c)
- (e) The environment to which the gauge is exposed during normal use and maintenance is not detrimental to its safety.
- (f) Protection afforded by the sealed source capsule is in accordance with ANSI 77 C64343.
- (g) Protection afforded the source by the gauge is more than adequate for its application.
- (h) Additional protection is by means of a spring assisted gravity source shutter which can only be opened by means of an internal solenoid. In the event of power failure, the shutter reverts to its safe condition. The shutter is also arranged to close when the machine stops or when the cigarette rod is not moving through the Scanning Unit. This is automatically signalled from external detection devices.
- (i) The only shielding which can be lost is: in the event of a serious fire, the lead alloy lining of the outer cast iron cover will melt. Radiation Contours of the Scanning Unit with the lead alloy lining removed are shown in RC31 and RC32. It can be seen that under these conditions the surface radiation level does not exceed 10 m rem per hour.

7. Testing Procedures:

7.2 Use - Condition Temperature Tests.

The Scanning Unit was placed in an environmental chamber (FISONS type 280E/C/R10/IND) with electrical connection made through an access hole in the side of the chamber. Gauge measurement performance was also tested in addition to the required safety tests.

- 7.2.3 The stray radiation was measured at 20°C prior to the test, which conformed to Radiation Contours RC27

and RC28. The safety shutter and indicators were operating correctly.

The temperature of the chamber was reduced to 0°C and the Scanning Unit temperature, as monitored by a built-in thermistor probe, allowed to stabilise. 30 and 60 minutes after stabilisation the source shutter operation was verified.

The chamber temperature was returned to 20°C and allowed to stabilise, the source shutter operation was then again verified.

The chamber temperature was then increased to 60°C and the Scanning Unit temperature allowed to stabilise. At 30 and 60 minutes after stabilisation, the source shutter was again verified.

The chamber temperature was then reduced to 20°C and allowed to stabilise, after which the source shutter operation was verified.

For reasons other than safety, the Chamber was then cycled at 0°C for twelve hours followed by 60°C for twelve hours with the source shutter continuously open. This cycling was repeated for one week.

After removal from the chamber, there was found to be no degradation of stray radiation levels, source shutter/indicator operation or source integrity. The radioactive source capsule was removed and leak tested, no detectable leakage was present.

- 7.3.1 An air ionisation chamber survey meter was not
7.3.2 & used during the stray radiation tests. The
7.3.3 radiation monitor used was a 'Nuclear Enterprise'
type PDR4 fitted with an external G.M. counter tube
type BP1/1 (Mullard MX168) with a 17mm diameter
window. The monitor, together with the external
tube was however, calibrated specifically for
Strontium-90 beta and Bremsstrahlung radiation
(copy of test certificate attached). The beta
component of the radiation measurements was
determined by taking the difference between the
count-rate reading with and without a 1cm plastic
additional absorber and then applying the appropriate
conversion factor of 12 counts/sec. = 1 m Rem/h.

It was not considered necessary to use the 300 mg/cm² absorber described in 7.3.2.1 as this would give lower readings for beta radiation only, to which the operator's body would not be exposed. At worst, the operator's hands may be exposed to an occasional six-second dose of beta radiation, where the 7 mg/cm² absorber would apply. A piece of polyethylene film having an approximate thickness of 4 mg/cm² was attached to the G.M. tube mica window of 2.5 - 3.0 mg/cm².

7.4 Accident Condition Fire Test.

7.4.1 Equipment: The furnace used for this test was a 'Wild-Barfield' model HW2014/40X, having internal dimensions of approx. 120cm x 80cm x 50cm with 34kw of electrical heating power via a temperature controller. The temperature of the Scanning Unit was monitored by means of an iron/copper thermocouple inserted into a close fitting hole in the Scanning Unit back-plate. The thermocouple e.m.f. was recorded on a potentiometric chart recorder having a full scale sensitivity of 50mv. (see fig. 1).

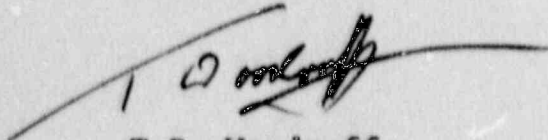
7.4.2 Procedure: The furnace temperature was first of all raised to what was thought to be 550°C, as indicated by the temperature controller. The Scanning Unit, fitted with a dummy source capsule (as permitted in section 6.1) was then placed in the furnace. The Scanning Unit temperature, increased as shown in fig. 1 and stabilised after two hours at 475°C. This temperature was verified by means of a separate probe inserted through an inspection hole in the furnace door, and it was concluded that the furnace temperature control indication was incorrect. A further increase in the temperature control setting resulted in a final temperature, after one hour stabilisation, of 550°C as shown in fig. 1. The Scanning Unit was then removed from the furnace and allowed to cool.

7.4.3 Evaluation: The Scanning Unit was examined after cooling to room temperature. The dummy source capsule was found to be still captive in its protective source housing, which was still firmly retained in the Scanning Unit back-plate and block assembly. The source shutter was still safely positioned in the closed condition. As expected, the lead alloy lining of the cast iron cover had

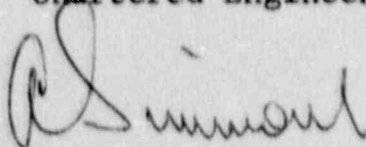
melted, which was the only change in radiation shielding conditions during the fire test. Radiation Contours RC31 and RC32 show measurements of stray radiation around the Scanning Unit without the lead alloy lining in the cover (source shutter closed.)

To the best of our knowledge and belief, the information contained in this report is a true representation of the tests performed and the results obtained therein.

For and on behalf of MOLINS TOBACCO MACHINERY LTD



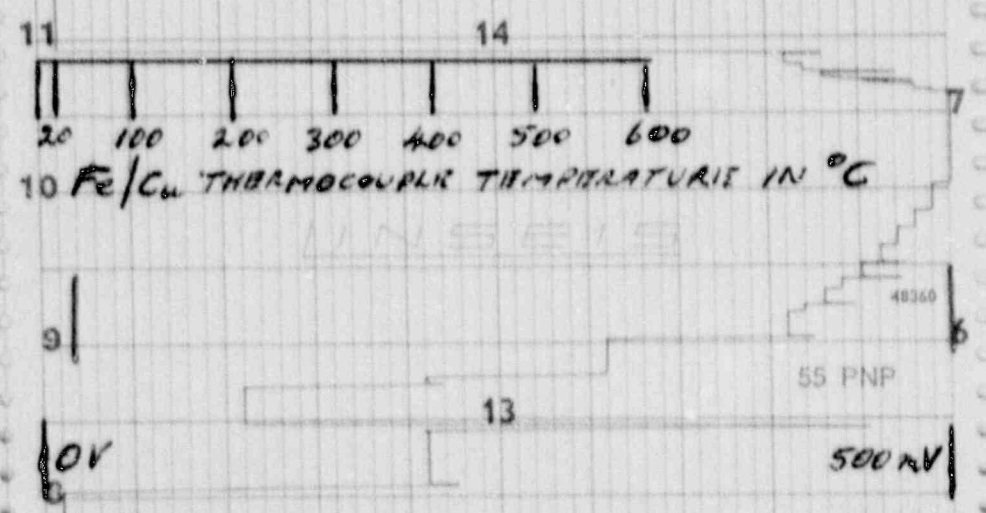
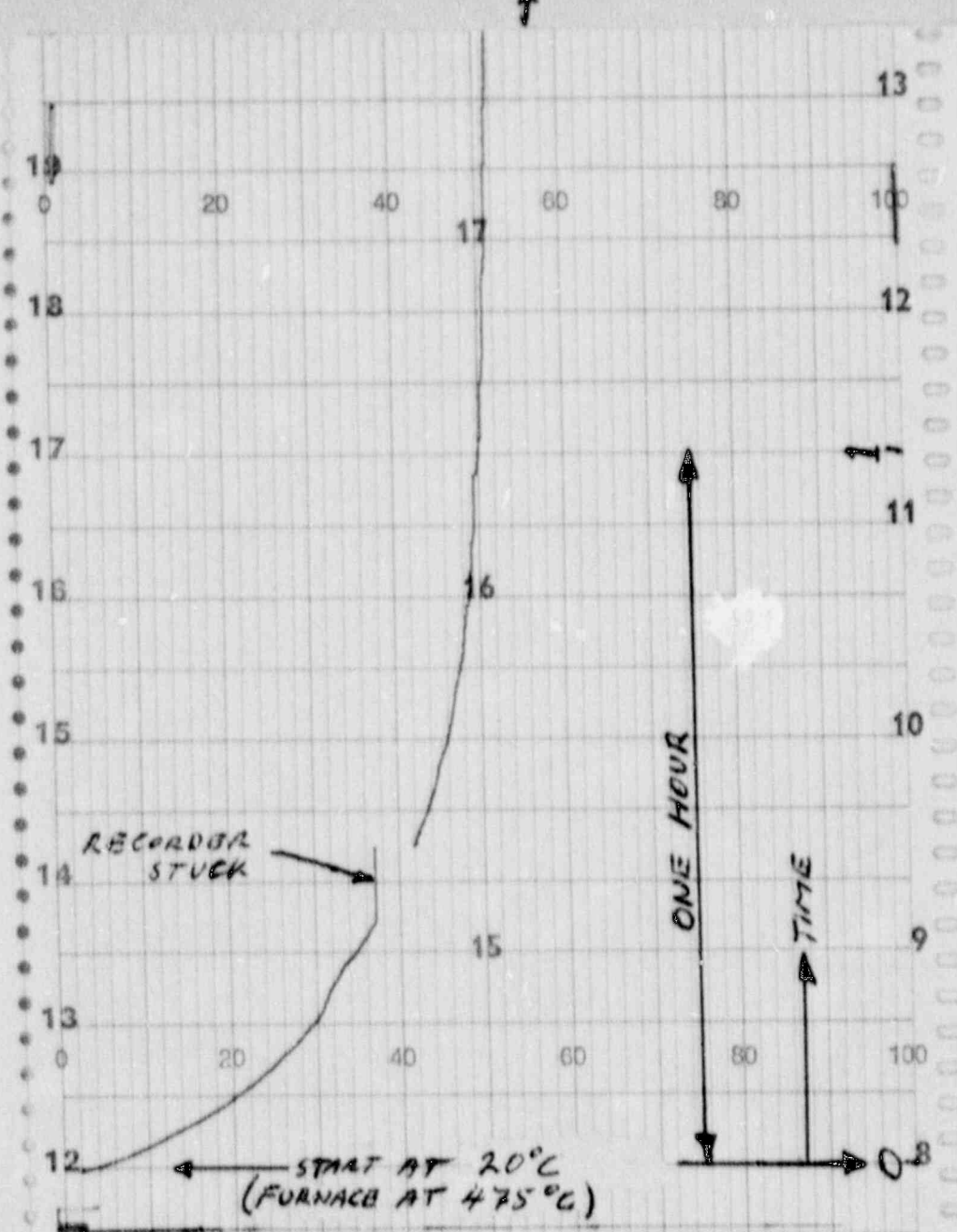
T.R. Woodruff
Chartered Engineer

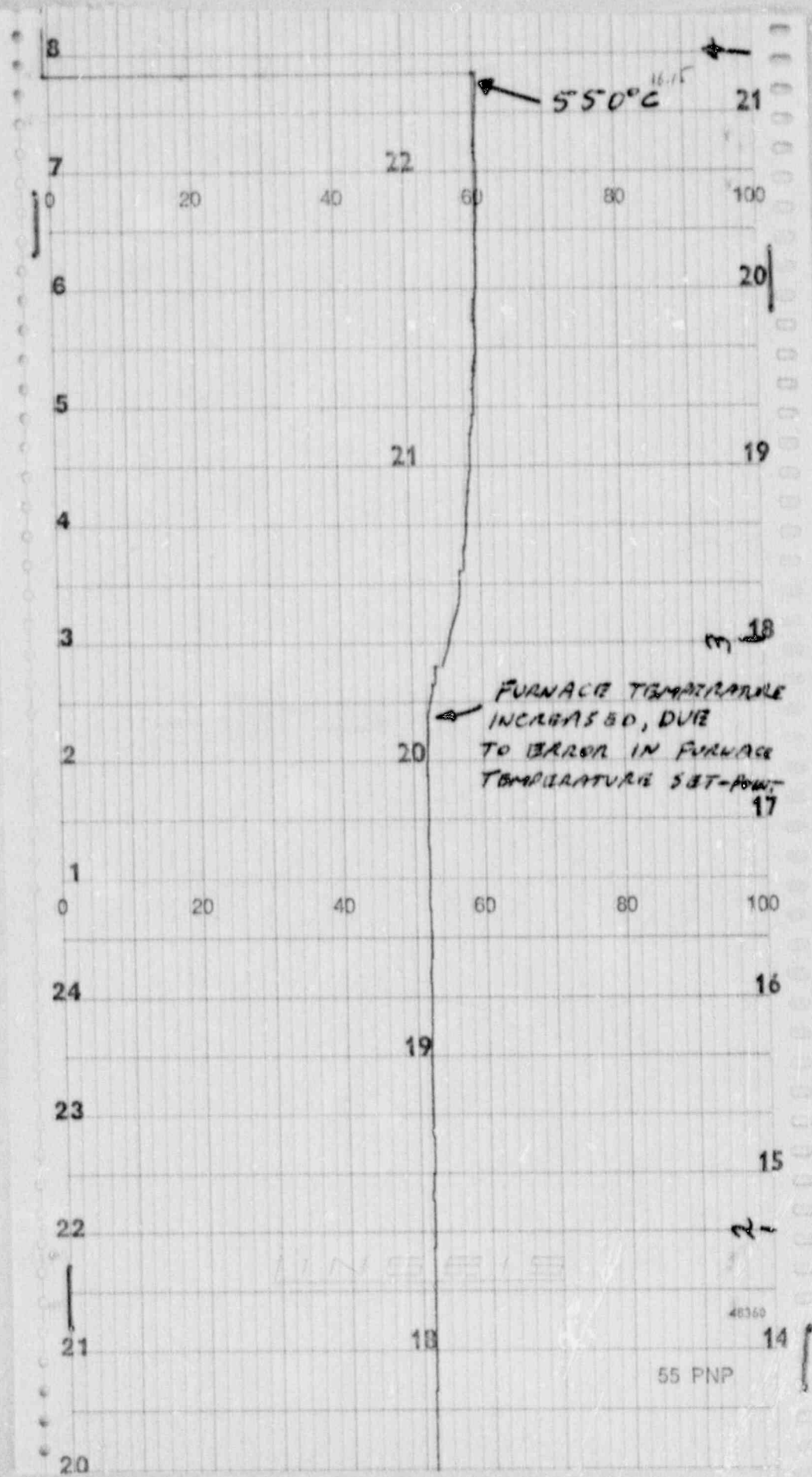


A. Simmons
Chartered Engineer

25 February 1981.

CONTINUED





Certificate of Test of a Radiation Measuring Instrument

REPORT NO. IT

A Details of user

1 Name and address of occupier

Molins Ltd.,
Saunderton,
High Wycombe,
Bucks. HP14 4JE

2 Address of factory for which the instrument is provided (if different from (1))

B Details of instrument

Description of instrument See over

Distinguishing number or mark of instrument See over

C Details of test

Reason for test Periodic retest Date of test 18 November 1980

Nature of test

See over

Results of test See over

Full name and description of person who made the test

A. Wiltshire

Asst. Scientific Officer

A. Wiltshire

Instrument Test No.	Type of Instrument	Identity No.	Result of Test
NRPB/ 6617	Mini Instrument 5.10E	7168	<u>Tested with Am-241 and Cs-137 gamma radiation</u> For measuring Cs-137 gamma and bremsstrahlung arising from Sr-90/Y-90 35 cps = 1 mrem/h (10 μSv/h). See attached notes.
NRPB/ 6618	Nuclear Enterprises PDR4 with probe HP1/1	030 1257	<u>Tested with Am-241 and Cs-137 gamma radiation</u> <u>Internal GM Tube</u> For measuring Am-241, Cs-137 gamma radiation, x radiation and Bremsstrahlung of effective energy greater than 50 keV the scale reading correct to within ± 30%. <u>External G.M. Tube</u> Unsatisfactory. The wire was broken at one of the plugs.
NRPB/			
NRPB/ 6619	Nuclear Enterprises PDR4 with probe HP1/1	019 1271	<u>Tested with Am-241 and Cs-137 gamma radiation and Sr-90/Y-90 beta radiation</u> <u>Internal GM Tube</u> For measuring Am-241, Cs-137 gamma radiation, x radiation and bremsstrahlung of effective energy greater than 50 keV the scale reading correct to within ± 30%. <u>External GM Probe</u> For measuring bremsstrahlung arising from Sr-90/Y-90 20 cps = 1 mrem/h (10 μSv/h) For measuring Sr-90/Y-90 beta radiation 12 cps = 1 mrem/h. See attached notes.
NRPB/			

NOTES

- 1 A statement in the section "Results of Test" of satisfactory implies that within the range specified the indicated dose rate is not more than double nor less than one half of the dose rate, measured in millirads per hour (mrad/h), which would be received at the point of measurement by soft biological tissue (taken as similar to water). Dose rates in mrad/h may be considered as numerically equal to dose equivalent rates in millirem per hour (mrem/h), the unit used in current legislation and Codes of Practice.
- 2 The response of an instrument when measuring X-ray dose rates is difficult to specify because it depends both on the X-ray equipment in use and the conditions under which measurement are made. In particular scattered radiation, whether X- or Y-ray, if significantly degraded in energy may considerably affect the instrument response.

performance represents the most convenient and adequate summary that is possible, bearing in mind the instrument's inherent limitations and the range of measurements for which it is to be employed. However, it should be noted that a well designed instrument incorporating an ionisation chamber detector should be capable of accurate results over a wide range of radiation energies, whatever the conditions of measurement.

3 Saturation

Some instruments, particularly those incorporating geiger tubes, have reduced counting efficiency in higher dose rates. The extreme case of this is when the scale reading drops from full scale deflection (perhaps to ZERO) in dose rates considerably in excess of the maximum indicated on the scale. As part of the test this factor is checked and when the report indicates that saturation occurred

Instrument Test No.	Type of Instrument	Identity No	Result of Test
NRPB/ 6617	Mini Instrument 5.10E	7168	<u>Tested with Am-241 and Cs-137 gamma radiation</u> For measuring Cs-137 gamma and bremsstrahlung arising from Sr-90/Y-90 35 cps = 1 mrem/h (10 µSv/h). See attached notes.
NRPB/ 6618	Nuclear Enterprises PDR4 with probe EP1/1	030 1257	<u>Tested with Am-241 and Cs-137 gamma radiation</u> <u>Internal GM Tube</u> For measuring Am-241, Cs-137 gamma radiation, x radiation and Bremsstrahlung of effective energy greater than 50 keV the scale reading correct to within $\pm 30\%$. <u>External G.M. Tube</u> Unsatisfactory. The wire was broken at one of the plugs.
NRPB/			
NRPB/ 6619	Nuclear Enterprises PDR4 with probe EP1/1	019 1271	<u>Tested with Am-241 and Cs-137 gamma radiation and Sr-90/Y-90 beta radiation</u> <u>Internal GM Tube</u> For measuring Am-241, Cs-137 gamma radiation, x radiation and bremsstrahlung of effective energy greater than 50 keV the scale reading correct to within $\pm 30\%$. <u>External GM Probe</u> For measuring bremsstrahlung arising from Sr-90/Y-90 <u>20 cps = 1 mrem/h (10 µSv/h)</u> For measuring Sr-90/Y-90 <u>beta radiation</u> <u>12 cps = 1 mrem/h.</u> See attached notes.
NRPB/			

NOTES

- 1 A statement in the section "Results of Test" of satisfactory implies that within the range specified the indicated dose rate is not more than double nor less than one half of the dose rate, measured in millirads per hour (mrad/h), which would be received at the point of measurement by soft biological tissue (taken as similar to water). Dose rates in mrad/h may be considered as numerically equal to dose equivalent rates in millirem per hour (mrem/h), the unit used in current legislation and Codes of Practice.
- 2 The response of an instrument when measuring X-ray dose rates is difficult to specify because it depends both on the X-ray equipment in use and the conditions under which measurement are made. In particular scattered radiation, whether X- or Y-ray, if significantly degraded in energy may considerably affect the instrument response. This may be particularly so with an instrument which incorporates a Geiger-Muller tube. The generalised statement of the instrument's

performance represents the most convenient and adequate summary that is possible, bearing in mind the instrument's inherent limitations and the range of measurements for which it is to be employed. However, it should be noted that a well designed instrument incorporating an ionisation chamber detector should be capable of accurate results over a wide range of radiation energies, whatever the conditions of measurement.

3 Saturation

Some instruments, particularly those incorporating geiger tubes, have reduced counting efficiency in higher dose rates. The extreme case of this is when the scale reading drops from full scale deflection (perhaps to ZERO) in dose rates considerably in excess of the maximum indicated on the scale. As part of the test this factor is checked and when the report indicates that saturation occurred during the tests then care must be exercised if the instrument is to be used in areas where high dose rates might be encountered.

MOLINS

Machine Company Inc

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Our Reference
Your Reference

January 5, 1981

United States Nuclear Regulatory Commission
Fuel Cycle Material Certification and Procedure Branch
Mail Stop 396SS
Washington, D.C. 20555

Attn: Mr. Mark L. Au

Gentlemen:

Ref: Control No. 80-49

We hereby submit additional information in support of our application for amendments to our byproduct material licenses as follows:

1. Identification:
Molins MAID N Scanning Unit
2. Proposed Use:

This device will be used to measure rod density on continuous rod cigarette makers. Users of the device are non-technically trained machine operators, male and female, usually of age 21 years or older. The normal operating environment is at temperature of 30 degrees to 50 degrees centigrade and 50 percent to 65 percent relative humidity. There are no corrosive gases, vapors, or dusts in the normal environment.

The unit is constructed in such a way that it will survive explosion, earth quake, and all but the worst fires. The probable effect of a bad fire would be electrical failure that would cause the source shutter to close. It is unlikely that the device would "melt-down" and expose the radioactive source because it is mounted to the massive body of the cigarette maker.

Design of the device is for specific use on cigarette makers; application to other uses would require extensive redesign and modification.

3. Radioactive Material:

The device contains a single sealed source Amersham Model SIF2874/X117 containing 25 millicuries of Strontium 90. This source has been registered with the NRC.

4. Construction:

Construction of the device is illustrated by Outline Drawing of MAID N Scanning Unit Drawing No. 98-052-168
SA Sheets SA 4613-001-1 SA 4618-001-1
 SA 4614-001-1 SA 4619-001-1

Mask Tube Assembly 39209-080
S.U. Cover 39208-580
Warning Plate SK.U. 17420

The Scanning Unit cover is secured by four tamper-proof screws of the socket cap type having pins in the center of the socket. These screw heads are recessed into the cover and require a special tool for removal.

The radioactive source, along with warning plate SK.U. 17420, is secured by tamper-proof screws of the button-head socket type with pins in the socket, requiring special tool for removal.

5. Human Access:

Human access to the head is limited by the location on the machine and by the cut-off guard. Photograph Nos. 2, 3, and 4 show the unit in place with the cut-off guard open. The source shutter is closed under this condition except when a specifically licensed person actuates a locked switch in the equipment cabinet and presses the SU check button on the cabinet front panel.

Photograph Nos. 1 and 5 show the unit on the machine with the cut-off guard closed. This is the normal operating condition.

6. Useful Life:

The useful life of the device is 20 years.

7. ANSI Classification Designation:

The ANSI Classification designation of the device is 33-685-685-P2. The ANSI Classification of the SIFQ2874/X117 source is ANSI 770-C-64343.

8. Labelling and Instructions for Use:

Labelling of the device consists of Radiation Warning Plates Drawing No. 3113-346 and 31125-693 (enclosed).

Warning plate Drawing No. SKU. 17420 (enclosed) is attached behind the radioactive source.

The Molins MAID N Customer Handbook is enclosed.

An additional section of the Handbook, separate from the Handbook, and covering Installation and Radioactive Source Handling, is also enclosed. This section is for use by persons specifically licensed by the NRC or an Agreement State to perform these procedures.

9. Availability of Services:

Installation and relocation of the units; initial and relocation radiation surveys; leak testing of radioactive sources; repair; periodic maintenance and periodic shutter checks; source exchange; emergency procedures; and source disposal services are available from Molins Machine Company, Inc., operated in Richmond, Virginia under the terms of Byproduct Material License No. 45-02429-01.

With the exception of source disposal, all of the aforementioned services are available on a day to day basis. Source disposal is by transfer from Molins Machine Company, Inc., to a licensed disposal contractor.

10. Radiation Exposure to Personnel:

Very low external radiation levels have been achieved by the shielding and beam geometry. In the "shutter closed" condition as shown by RC 28 (enclosed), the working beam of Beta particles is blocked by the stainless steel shutter. In the normal operating condition, the shutter is open and the cigarette entrance and exit guides are closed by the cigarette rod, limiting external radiation to the valves shown by RC 30 (enclosed).

RC 29 (enclosed) shows the external radiation levels during the six second period that the shutter is open with no cigarette rod in the guides, as during the manual check that can be initiated only by a qualified person.

Under normal operating conditions, the operator will spend only two hours per working day within 30 cm of the scanning unit and during this time would receive a whole-body dose rate less than 0.2 mr/hour; this would result in an exposure of no more than 100 mr/year of 250 working days. During the remaining 6 hours per day his exposure would be less than 0.1 mr/hour and would result in a yearly exposure of no more than 150 mr/year, for a total of no more than 250 mr/year.

Exposure to the operator's hand, if within 20 cm of the entrance guide, would be no more than 200 mr/hour for a period of 6 seconds, 10 times per day, 250 days per year, giving a yearly total of no more than 833 mr.

The enclosed photograph Nos. 2, 3, and 4 show the unit mounted in the normal position on a Molins MARK 9 cigarette making machine. The cut-off guard is open. It would be impossible to start the machine in this condition, and, since maintaining the source shutter open depends on actually making cigarettes, the shutter would always be closed when this guard is open. The only exception to this is the condition where a specifically licensed person would use the "maintenance check" feature on the MAID cabinet; use of this feature requires a special key plus manual operation of a button on the front panel.

Photograph Nos. 1 and 5 show the unit in position on the machine, but with the cut-off guard cover closed. This guard is not an effective radiation shield, but it limits bodily proximity to the unit, particularly to the areas of the cigarette rod guide apertures.

Drawing No. SK.U. 17420 depicts the warning plate to be placed behind the radioactive source and to be held in place by the tamper-proof source mounting screws. Screws holding the scanning unit outside cover are also tamper-proof. Special tools are required to remove the source mounting screws and the outside cover screws.

11. Quality Control:

Quality control procedures in the manufacture of the MAID N Scanning Unit entail in-process piece part inspection to assure that dimensions are within the design tolerance. -

The finished unit is tested for proper operation of the source shutter mechanism and radiation surveys are carried out to assure that radiation levels are no greater than those shown by RC 28 and RC 29.

Each source is leak tested to assure that leakage or contamination does not exceed 0.005 microcuries. In practice, any source showing contamination or leakage significantly above background level would be rejected.

No certificate of assay of source strength is supplied by the source manufacturer; each source is tested by comparison with a known standard source in an ionization chamber test device.

12. Documents Supplied with Device:

A sample of the source leak test certification letter and leak test record as supplied with each device is enclosed.

The initial survey sheet RC 30 is also supplied upon completion of the installation. Actual values are recorded adjacent to the printed values on the sheet.

Two copies of the following are enclosed:

- Radiation Surveys RC 27, RC 28, RC 29, and RC 30.
- Photograph Nos. 1, 2, 3, 4, and 5
- Manuals MAID N Scanning Unit Customer Handbook
- Special Section of Handbook "Installation and Radioactive Source Handling"
- Source Leak Test Certification Letter and Leak Test Record
- Drawing No. 39209-080 Mask Tube Assembly
- Drawing No. 39208-580 S. U. Cover
- Drawing No. 98052-168 Outline Drawing MAID N Scanning Unit
- Drawing No. 3113-346 Radiation Warning Plate
- Drawing No. 31125-693 Radiation Warning Plate
- Drawing No. SK.U. 17420 Warning Plate
- SA Sheets SA 4513-001-1 SA 4618-001-1
- SA 4614-001-1 SA 4619-001-1
- SA 4617-001-1

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We hope that this information will enable you to complete your safety evaluation.

Yours truly,

MELINS MACHINE COMPANY, INC.

E. Harrison, Jr.

E. Harrison, Jr.

Enclosure

cc: Mr. L. E. H. North