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June 18, 1986

BY HAND

Mr. Vandy L. Miller
Chief Materials Licensing Branch
Nuclear Regulatory Commission
7915 Eastern Avenue
Silver Spring, Maryland 20901

Re: North American Philips Lighting Corporation,
Materials License No. 29-20609-02

Dear Mr. Miller:

Enclosed is an original and two copies of an application for a license amendment by North American Philips Lighting Corporation. Because of the competitive situation in which North American Philips finds itself, the company requests that this amendment be given expedited processing.

Please feel free to contact me if I can provide any further information. I very much appreciate your assistance.

Sincerely,

Richard A. Meserve
Richard A. Meserve

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NMSS LIC30
29-20609-02 PDR

RAM:jeg

Enclosure

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PHILIP F. DIETZ
Senior Vice President

June 17, 1986

Mr. Vandy L. Miller
Chief, Materials Licensing Branch
Nuclear Regulatory Commission
Washington, D.C. 20055

Re: North American Philips Lighting Corporation,
Materials License No. 29-20609-02

Dear Mr. Miller:

The above-captioned license authorizes North American Philips Lighting Corporation ("North American Philips") to possess and store glow switches containing krypton-85, to install the glow switches in fluorescent lamps, and to distribute the lamps to persons exempt from licensing. I am writing to request that the NRC issue a license amendment authorizing North American Philips to possess, store, install, and distribute glow switches containing tritium in fluorescent lamps as well. North American Philips also seeks authorization to use its krypton-85 glow switches in certain lamps in addition to those specified in its original application.

North American Philips requests the expedited processing of this request because the amendment has a very substantial economic significance to North American Philips, its employees, and its customers. We understand that several other manufacturers are selling similar lamps within the United States and any failure to obtain prompt disposition of this request for an amendment will place North American Philips at a substantial marketing disadvantage. This is particularly the case since it is difficult in the commercial lighting business to recover a customer that has been lost to a competitor.

I.

The glow switches containing tritium will be used in certain 10-, 13-, 18- and 26-watt lamps. The switches are manufactured by N.V. Philips Gloeilampenfabrieken ("N.V. Philips"), which is located in Eindhoven, The Netherlands. Initially fluorescent lamps containing the glow switches will also be manufactured by N.V. Philips, and imported to North American Philips. The lamps will eventually be produced in the North American Philips' facility in Lynn, Massachusetts, using glow switches produced by N.V. Philips.



NORTH AMERICAN PHILIPS LIGHTING CORPORATION

One Westinghouse Plaza — Bloomfield, New Jersey 07003
(201) 429-3000

Mr. Vandy L. Miller
June 17, 1986
Page 2

In support of the exempt distribution of the lamps and glow switches we submit the following information as required by 10 CFR 32.14:

(1) CHEMICAL AND PHYSICAL FORM AND MAXIMUM QUANTITY OF BY-PRODUCT MATERIAL IN EACH PRODUCT

Each glow switch will contain trace amounts of gaseous atomic tritium. The glow switch contains a filling gas of 60% argon, 29% neon, and 11% helium, with 500 nanocuries (maximum) of tritium.

(2) DETAILS OF CONSTRUCTION AND DESIGN OF EACH PRODUCT

The glow switch is used in the starting circuit of the fluorescent lamp along with a small capacitor that is wired in parallel. This circuit preheats, through an in-series ballast, the two electrodes within the fluorescent bulb prior to ignition of the discharge. Initial lamp discharge occurs when the glow switch opens, supplying a high voltage pulse across the fluorescent bulb. The main lamp discharge occurs directly thereafter, with the lamp current being regulated by the in-series ballast. Tritium is used in the glow switch starter to initiate the ionization of the argon, helium, and neon filling gases and serves to insure predictable operation of the switch.

The glow switch and its capacitor are attached to the bottom of the lamp and protected by a rigid plastic base. The glow switch is identical in construction to the switch described in the North American Philips application; Exhibit A to the exempt-distribution application sets out the details of construction.

(3) THE METHOD OF CONTAINMENT OR BINDING OF THE BY-PRODUCT MATERIAL IN THE PRODUCT

The gases in the glow switch are contained in a fusion-sealed, 20% lead glass capsule having a nominal wall thickness of 0.016 inches.

(4) PROCEDURES AND RESULTS OF PROTOTYPE TESTING DEMONSTRATING THAT THE MATERIAL WILL NOT BECOME DETACHED FROM THE PRODUCT AND THAT THE BY-PRODUCT MATERIAL WILL NOT BE RELEASED TO THE ENVIRONMENT

The glow switches will be produced and distributed for sale in Europe by N.V. Philips. Careful testing during manufacture assures that the product does not threaten a release to the environment. These tests are described below.

(5) QUALITY CONTROL PROCEDURES TO BE FOLLOWED IN THE FABRICATION OF PRODUCTION LOTS OF THE PRODUCT

The same procedures used in the production of glow switches containing krypton-85 will be used in the production of the tritium-filled switches. The activity of every bottle of the filling gas used in the glow switches is checked at a gas plant operated by N.V. Philips using a Berthold Radiation Measuring Instrument (Model LB1200) and then is checked again before the bottle is used in the production of the switches with the same model instrument. The fill pressures of the completed glow switches are checked with a McCleod gauge during production using a sample of approximately 3 out of every 10,000 glow switches.

A sample of the completed glow switches are subjected to an endurance test by N.V. Philips immediately following fabrication. The test consists of 5,000 cycles in which during each cycle the switch is turned on for two seconds and then turned off for twenty-eight seconds. Data from the testing of the glow switches containing krypton-85 reveal the reliability of the production process. Approximately 1564 of the krypton-85 glow switches were tested in 1985, and only 1.46% failed the test because of out-of-specification closing. No switches failed due to poor seals. This test reveals the integrity of the fusion seal.

After 500 hours of storage, a sample of the glow switches is tested by N.V. Philips with a spark coil to determine whether the switch is a "slow leaker." The test consists of the observation of the color of the discharge that is initiated by the spark coil. It is estimated that a change in the filling gas of 20 PPM (or more) can be detected using this test. In 1985, approximately 8,400 of the krypton-85 switches were tested this way and 0.048% were determined to be "slow leakers." Because the switches are filled at below atmospheric pressure -- 26mm Hg -- any leak will pull air into the switch. Thus a leak does not threaten an immediate release to the atmosphere.

In the course of fabricating fluorescent lamps using the glow switches, every lamp is tested at the end of the production line to assure the lamp operates. If the glow switch starter is defective -- for example, because the glow switch starter is a slow leaker -- the lamp will not operate and the lamp is rejected.

Mr. Vandy L. Miller
June 17, 1986
Page 4

(6) THE PROPOSED METHOD OF LABELING

The completed lamps are sold for the most part to commercial customers. Some lamps are individually packaged. Other lamps are sold in a "bulk-pack" -- a 50-lamp carton in which the lamps are placed within the carton in trays, but in which each lamp is not placed in an individual package, North American Philips will include a marking on the outside of each individually packaged lamp that reads as follows:

"This lamp uses a glow switch containing less than 500 nCi of ^3H and is distributed by North American Philips Lighting Corporation."

North American Philips will include a marking on the outside of its bulk pack that reads as follows:

"Each lamp uses a glow switch containing less than 500 nCi of ^3H and is distributed by North American Philips Lighting Corporation."

(7) RADIATION LEVELS & METHODS OF MEASUREMENT

The radiation level for the glow switch is less than 0.3 microrentgen/hour at a distance of 1 cm. Any radiation from a glow switch is attenuated in use by the plastic base of the lamp.

In addition to the authorization for exempt distribution, North American Philips seeks authorization to possess, store, and install the glow switches at the same locations and under the same circumstances described in its application. The maximum number of tritium-filled glow switches (including completed lamps containing glow switches) and waste on hand at any one time in the Lynn Facility is estimated at 1.75 million pieces. Thus the maximum inventory of tritium at the Lynn Facility is estimated at 875 millicuries. The maximum inventory of glow switches (in completed lamps) containing tritium in warehouses that are subject to the NRC license is estimated at 1 million pieces, or less than 500 millicuries of tritium.

In this connection, North American Philips requests that the NRC authorize North American Philips to possess a limited quantity of the tritium-filled glow switches in its warehouses pending the disposition of this request for an amendment. Lamps containing the Tritium-filled glow switches are sold in Europe and, as a result of premature and inadvertent orders, a limited quantity of lamps have

Mr. Vandy L. Miller
June 17, 1986
Page 5

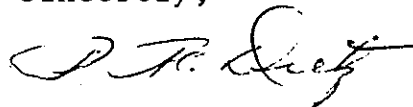
recently been received and other lamps are in transit. In particular, North American Philips now has possession of approximately 2000 lamps, containing a total of less than 1000 microcuries of tritium, at its warehouse in Fairmont, West Virginia. (This possession is authorized by the NRC regulations governing exempt quantities. See 10 C.F.R. 30.18, 30.71, Schedule B.) Approximately 13,000 lamps, containing a total of less than 6500 microcuries of tritium, are now in transit from N. V. Philips. North American Philips will assure that none of these lamps are sold and that no further orders for such lamps are placed pending NRC approval.

II.

North American Philips' application specifies that the krypton-85 glow switches will be installed in certain 5-, 7-, 9-, and 13-watt lamps. North American Philips now seeks authorization to install and distribute the glow switch previously licensed for the 13-watt lamp in certain 14-, 20-, and 28-watt lamps. The glow switch will be located in the plastic base of the lamp using the same construction described in the application. In all respects other than the wattage of the lamp, this use of the glow switch is fully described in the North American Philips application.

I enclose a check in the amount of \$180 for the processing of this application for an amendment. Please contact Mr. Ed Morton (617/599-7500) if you need any additional information.

Sincerely,



P. F. Dietz
Senior Vice President
Corporate Development

PFD/11
Encl.



PHILIPS

~~PHILIPS LIGHTING COMPANY~~

May 26, 1988

Mr. Vandy L. Miller, Chief
Material Licensing Branch
Division of Fuel Cycle and
Material Safety
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Philips Lighting Company
Materials License No. 29-20609-02

Dear Mr. Miller:

The above license, as amended, authorizes Philips Lighting Company, a division of North American Philips Corporation, to possess and store glow switches containing krypton-85, tritium and promethium-147, to install the glow switches in electric lamps, and to distribute the lamps to persons exempt from licensing.

Philips Lighting Company ("PLC") hereby requests that the NRC issue a license amendment to authorize PLC to possess, store and distribute glow switches containing tritium in certain lamps in addition to those previously specified. The new lamps are known as high pressure sodium ("HPS") lamps and are used mainly for street lighting and other industrial/commercial applications.

The glow switches are manufactured by N.V. Philips Gloeilampenfabrieken ("N.V. Philips"), Eindhoven, The Netherlands and will be imported by Philips Lighting Company for incorporation into the lamps at our Bath, New York manufacturing plant. Lamps may also be imported in finished form from N.V. Philips. Appropriate licenses from the State of New York will be obtained. The finished lamps will be stored and distributed through the warehouse locations licensed for handling of PL and PLC lamps under our existing radioactive materials license.

In support of the exempt distribution of the lamps with glow switches we submit the following information as required by 10 CFR 32.14:

(1) CHEMICAL AND PHYSICAL FORM AND MAXIMUM QUANTITY OF BY-PRODUCT MATERIAL IN EACH PRODUCT.

Each glow switch contains a maximum of 0.4 microcuries (400 nanocuries) of adsorbed tritium (hydrogen 3), along with a neon/argon filling gas mixture.

Philips Lighting Company
P.O. Box 6800 • Somerset, NJ 08875-6800

A Division of North American Philips Corporation

(2) DETAILS OF CONSTRUCTION AND DESIGN OF EACH PRODUCT.

The glow switch is used in the starting circuit of the lamp. The discharge is started when the glow switch opens, supplying a high voltage to the high pressure sodium arc tube from an external ballast. Hydrogen-3 is used in the switch to initiate the ionization of the neon/argon filling gas and serves to insure predictable operation of the switch. The switch is attached between the arc tube and the lamp stem, and the sealed glow switch capsule is fully enclosed within the sealed glass outer bulb of the lamp; this outer bulb is typically made of borosilicate glass having a nominal thickness of .025 inches. A detailed drawing of the switch is provided in Exhibit A.

(3) THE METHOD OF CONTAINMENT OR BINDING OF THE BY-PRODUCT MATERIAL IN THE PRODUCT.

The tritium is adsorbed on a titanium substrate, and this material is contained in a fusion-sealed, 20% lead glass capsule having a nominal wall thickness of 0.032 inches.

(4) PROCEDURES AND RESULTS OF PROTOTYPE TESTING DEMONSTRATING THAT THE MATERIAL WILL NOT BECOME DETACHED FROM THE PRODUCT AND THAT THE BY-PRODUCT MATERIAL WILL NOT BE RELEASED TO THE ENVIRONMENT.

Careful testing during manufacture of the glow switches and the finished lamps assures that the products will not threaten a release to the environment. These tests are described below.

(5) QUALITY CONTROL PROCEDURES TO BE FOLLOWED IN THE FABRICATION OF PRODUCTION LOTS OF THE PRODUCT.

A sample of the completed glow switches is subjected to an endurance test by N.V. Philips immediately following fabrication. The test consists of 2,000 cycles in which during each cycle the switch is turned on for 3 seconds and then turned off for 27 seconds. The test reveals the integrity of the glow switch.

In addition, after 500 hours of storage, a sample of the switches is tested by N.V. Philips with a spark coil to determine whether the switch is a "slow leaker." The test consists of the observation of the color of the discharge that is initiated by the spark coil. It is estimated that a change in the filling gas of 20 ppm (or more) can be detected using this test. During the past seven months (since October, 1987), 3643 switches have been tested and none were slow leakers. At room temperature, the hydrogen-3 is absorbed on the titanium substrate and would not evaporate even from such a "slow leaker". (At 25 C, the vapor pressure of hydrogen-3 on the glow switch is less than 10^{-8} torr.) At temperatures above 200

C such as occur in an operating lamp, the hydrogen-3 can escape from the glow switch into the sealed, normally evacuated outer bulb of the lamp. Any such leak would release the neon/argon mixture into the outer bulb of the lamp.

The activity of every bottle of the hydrogen-3 suspension used in manufacturing is checked at a gas plant operated by N.V. Philips using a Berthold Radiation Measuring Instrument (Model LB 1200) and then is checked again before the bottle is used in the production of the switches with the same model instrument. The fill pressure of the completed switches is checked with a McCleod gauge during production using a sample of approximately 3 out of every 10,000 switches.

Finally, in the course of manufacturing lamps containing the glow switches in both Bath and The Netherlands, every lamp is tested at the end of the production line to assure that the lamp operates. If the glow switch is defective -- for example, because the switch is a "slow leaker" -- the lamp will not operate and the lamp is rejected.

(6) THE PROPOSED METHOD OF LABELING.

The completed lamps are sold mainly to commercial customers. Some lamps are individually packaged, whether other lamps are sold in bulk cartons.

For the lamps placed in individual packages, Philips Lighting will include a marking on the outside of each individually packaged lamp that reads as follows:

"The lamp uses a glow switch containing less than 400 nCi of ^3H and is distributed by Philips Lighting Company, a division of North American Philips Corporation."

Philips Lighting Company will include a marking on the outside of its bulk pack that reads as follows:

"Each lamp uses a glow switch containing less than 400 nCi of ^3H and is distributed by Philips Lighting Company, a division of North American Philips Corporation."

(7) : RADIATION LEVELS AND METHODS OF MEASUREMENT.

The radiation level from an intact glow switch cannot be detected because it is stopped by the glass walls of the glow switch. The radiation level from a glow switch with a broken glass capsule is about 0.1 Bq (beta-range in air is about 5mm); any

radiation from such a glow switch is attenuated in actual use by the outer bulb of the lamp.

* * *

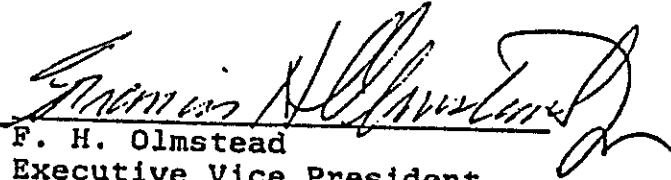
The lamps will be made with wattages of 150, 220 and 360. The maximum number of glow switches (including completed lamps containing glow switches) at any one time in the Bath, New York facility is estimated at 100,000 pieces. Because each glow switch contains about 0.4 microcuries of tritium, the maximum inventory of tritium at the Bath facility is estimated at less than 40 millicuries. The maximum inventory of glow switches (in completed lamps) in our licensed warehouses, excluding Bath, is estimated at 50,000 pieces, or less than 20 millicuries of tritium. The glow switches will not be distributed by Philips Lighting Company as separate components.

Therefore, we respectfully request an amendment to our federal radioactive material license to increase the maximum amount of tritium from 875 millicuries to 900 millicuries that may be stored in our licensed warehouses and distributed to persons exempt from licensing in the finished lamps described above. To the extent that the State of New York requires licensing for the manufacture, storage and distribution of the finished lamps containing tritium within New York, Philips Lighting Company will make due application to comply with that Agreement State's requirements.

Enclosed is a check for \$240.00 for the processing of this application for an amendment. If there is any further information you need to complete your review, please let us know so we may expeditiously respond.

PHILIPS LIGHTING COMPANY

By:


F. H. Olmstead
Executive Vice President
and General Manager
I/C Division

/asm
Enclosure

bcc: M. Markarian - Lynn
R. Meserve, Esq.
D. Tracey
G. Truncellito
D. Work
J. Uipkes



PHILIPS

Philips Lighting

FEDERAL EXPRESS

September 29, 1988

Mr. Vandy L. Miller, Chief
Material Licensing Branch
Division of Fuel Cycle and
Material Safety
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Philips Lighting Company
Materials License no. 29-20609-02

Dear Mr. Miller:

The above license, as amended, authorizes Philips Lighting Company, a Division of North American Philips Corporation, to possess and store glow switches containing krypton-85, tritium and promethium-147, to install glow switches in electric lamps, and to distribute the lamps to persons exempt from licensing.

Philips Lighting Company ("PLC") hereby requests that the NRC issue a license amendment to authorize PLC to possess, store and distribute compact fluorescent lamps containing glow switches with tritium in addition to those previously specified. The new lamps are known as SL*18 lamps and are used as energy saving replacements for standard incandescent lightbulbs.

The glow switches and finished lamps are manufactured by N. V. Philips Gloeilampenfabrieken ("N.V. Philips"), Eindhoven, The Netherlands and will be imported by Philips Lighting Company as finished lamps. The finished lamps will be stored and distributed through the warehouse locations licensed for handling of PL and PLC lamps under our existing radioactive materials license.

In support of the exempt distribution of the lamps with glow switches we submit the following information as required by 10 CFR 32.14:

(1) CHEMICAL AND PHYSICAL FORM AND MAXIMUM QUANTITY OF BY-PRODUCT MATERIAL IN EACH PRODUCT.

Each glow switch contains a maximum of 0.110 microcuries (110 nanocuries) of adsorbed tritium (hydrogen 3), along with a 50/50 argon/helium fill gas mixture at a pressure of 32 millimeters of mercury.

Philips Lighting Company
P.O. Box 6800 • Somerset, NJ 08875-6800

A Division of North American Philips Corporation

(2) DETAILS OF CONSTRUCTION AND DESIGN OF EACH PRODUCT.

The glow switch is used in the starting circuit of the lamp along with a small capacitor. This circuit preheats the cathodes within the fluorescent tube prior to ignition of the discharge. The discharge is started when the glow switch opens, supplying a high voltage to the fluorescent tube from an internal ballast. Hydrogen-3 is used in the switch to initiate the ionization of the argon/helium filling gas and serves to insure predictable operation of the switch. The switch is attached to the bottom of the lamp in such a way that it is protected by the outside base shell of the lamp. A detailed drawing of the switch is provided in Exhibit A.

(3) THE METHOD OF CONTAINMENT OR BINDING OF THE BY-PRODUCT MATERIAL IN THE PRODUCT.

The tritium is adsorbed on a titanium substrate, and this material is contained in a fusion-sealed, 20% lead glass capsule having a nominal wall thickness of 0.032 inches.

(4) PROCEDURES AND RESULTS OF PROTOTYPE TESTING DEMONSTRATING THAT THE MATERIAL WILL NOT BECOME DETACHED FROM THE PRODUCT AND THAT THE BY-PRODUCT MATERIAL WILL NOT BE RELEASED TO THE ENVIRONMENT.

Careful testing during manufacture of the glow switches and the finished lamps assures that the product will not threaten a release to the environment. These tests are described below.

(5) QUALITY CONTROL PROCEDURES TO BE FOLLOWED IN THE FABRICATION OF PRODUCTION LOTS OF THE PRODUCT.

A sample of the completed glow switches is subjected to an endurance test by N. V. Philips immediately following fabrication. The test consists of 2,000 cycles in which during each cycle the switch is turned on for 3 seconds and then turned off for 27 seconds. The test reveals the integrity of the glow switch.

In addition, after 500 hours of storage, a sample of the switches is tested by N. V. Philips with a spark coil to determine whether the switch is a "slow leaker." The test consists of the observation of the color of the discharge that is initiated by the spark coil. It is estimated that a change in the filling gas of 20 ppm (or more) can be detected using this test. During the past six months, 4000 switches have been tested and none were slow leakers. At room temperature, the

hydrogen-3 is adsorbs on the titanium substrate and would not evaporate even from such a "slow leaker". (At 25°C, the vapor pressure of hydrogen-3 on the glow switch is less than 10^{-8} torr.)

The activity of every bottle of the hydrogen-3 suspension used in manufacturing is checked at a gas plant operated by N. V. Philips using a Berthold Radiation Measuring Instrument (Model LB 1200) and then is checked again before the bottle is used in the production of the switches with the same model instrument. The fill pressure of the completed switches is checked with a McCleod gauge during production using a sample of approximately 3 out of every 10,000 switches.

Finally, in the course of manufacturing lamps containing the glow switches, every lamp is tested at the end of the production line to assure that the lamp operates. If the glow switch is defective -- for example, because the switch is a "slow leaker" -- the lamp will not operate and the lamp is rejected.

(6) THE PROPOSED METHOD OF LABELING.

All lamps are individually packaged and sold in bulk cartons of four or six lamps each.

Philips Lighting will include a marking on the outside of each individually packaged lamp that reads as follows:

"This lamp uses a glow switch containing less than 110 nCi of H^3 and is distributed by Philips Lighting Company, P.O. Box 6800, Somerset, N. J. 08875-6800, a Division of North American Philips Corporation.

Philips Lighting will include a marking on the outside of its bulk pack that reads as follows:

Each lamp uses a glow switch containing less than 110 nCi of H^3 and is distributed by Philips by Philips Lighting Company, P.O. Box 6800, Somerset, N.J. 08875-6800, a Division of North American Philips Corporation".

(7) RADIATION LEVELS AND METHODS OF MEASUREMENT.

The radiation level from an intact glow switch cannot be detected because it is stopped by the glass wall of the glow switch. The radiation level from a glow switch with a broken glass capsule is about 0.025 Bq (beta-range in air at about 5mm).

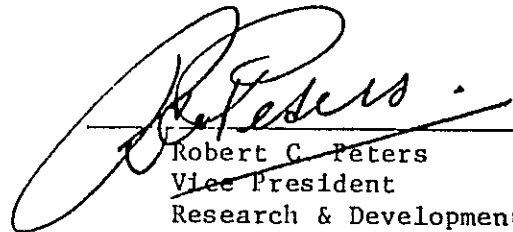
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The lamps will be made with a wattage of 18. The maximum number of completed lamps containing glow switches at any one time in the licensed storage facilities is estimated at 100,000 pieces. Because each glow switch contains about 0.110 microcuries of tritium, the maximum inventory of tritium at any time is estimated at less than 11 millicuries. The glow switches will not be distributed by Philips Lighting Company as separate components.

Therefore, we respectfully request an amendment to our federal radioactive material license to increase the maximum amount of tritium to 911 millicuries (we have an application dated May 26, 1988 pending to permit an increase from 875 millicuries to 900 millicuries) that may be stored in our licensed warehouses and distributed in the form of finished lamps to persons exempt from licensing.

Enclosed is a check for \$120.00 for the processing of this application for an amendment. If there is any further information you need to complete your review, please let us know so we may expeditiously respond.

PHILIPS LIGHTING COMPANY


Robert C. Peters
Vice President
Research & Development

bcc: D. Calleo
R. Cassidy
M. Markarian
R. Meserve, Esq.
D. Tracey



PHILIPS

File Copy

September 6, 1989

Mr. Vandy L. Miller, Chief
Material Licensing Branch
Division of Fuel Cycle and Material Safety
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Sep. 1 1989	
Check No.	482460
Amount	\$120
Fee Category	3B 3I
Type of Fee	AM D
Date Check Rec'd.	10/2/89
Date Completed	10/2/89
By:	S. Kimbrell

Re: Philips Lighting Company
Materials License No. 29-20609-02

030-22295

Dear Mr. Miller:

The above license, as amended, authorizes Philips Lighting Company, a Division of North American Philips Corporation, to possess and store glow switches containing Krypton-85, tritium and promethium-147, to install the glow switches in electric lamps, and to distribute the lamps to persons exempt from licensing.

Philips Lighting Company ("PLC") hereby requests that the NRC issue a license amendment to authorize PLC to possess, store and distribute electric lamps containing Krypton-85 in an inner arc tube in addition to the lamps containing glow switches previously specified. The new lamps are known as metal halide lamps designated MHN-TD and MHN-T and are used mainly for store lighting and other industrial/commercial applications.

The lamps are manufactured by N.V. Philips Gloeilampen-fabrieken ("N.V. Philips"), Eindhoven, The Netherlands at their plant in Turnhout, Belgium. The completed lamps will be imported by Philips Lighting Company. The lamps will be stored and distributed through the warehouse locations licensed for handling PL, PLC and SL under our existing radioactive materials license.

In support of the exempt distribution of the lamps with an inner arc tube containing Krypton-85, we submit the following information as required by 10 CFR 32.14:

1. CHEMICAL AND PHYSICAL FORM AND MAXIMUM QUANTITY OF BY-PRODUCT MATERIAL IN EACH PRODUCT.

There are three wattages of inner arc tubes used in these lamps. Each wattage version contains a different maximum amount of Krypton-85; as per the following table:

MHN-TD) MHN-T)	70 watt	.030 microcuries (30 nanocuries)
MHN-TD) MHN-T)	150 watt	.090 microcuries (90 nanocuries)
MHN-TD	250 watt	.200 microcuries (2100 nanocuries)

The Krypton-85 gas is in the inner arc tube along with an argon fill gas, mercury and iodide salts.

2. DETAILS OF CONSTRUCTION AND DESIGN OF EACH PRODUCT.

The inner arc tube is composed of quartz glass. Electrical connections are sealed into both ends of the quartz glass tube. Arc tube wall thicknesses vary with wattage. The 70 watt arc tubes have a wall thickness of $1.4 \text{ mm} \pm 0.15$, the 150 watt tubes $1.35 \text{ mm} \pm 0.15 \text{ mm}$ and the 250 watt have a wall thickness of $1.6 \text{ mm} \pm .2 \text{ mm}$. Tungsten electrodes attached to the electrical connections are inside the arc tube. This inner arc tube is inside an outer envelope, also made of quartz glass in the case of the MHN-TD lamps. The MHN-T lamps have outer envelopes of borosilicate glass. The outer envelopes have a wall thickness of $1.25 \text{ mm} \pm 0.13$. The electrical connections from the inner arc tubes are sealed into the ends of the outer envelope which makes connection to the outside electrical supply. The Krypton-85 in the inner arc tube is used to facilitate the initiation of the arc struck between the tungsten electrodes. Drawings of the construction along with a dimension table are shown in Exhibits A and B.

3. THE METHOD OF CONTAINMENT OR BINDING OF THE BY-PRODUCT MATERIAL IN THE PRODUCT.

The Krypton is introduced into the inner arc tube through a fill tube attached to the side wall of the arc tube along with the argon; the ends of the arc tube having been sealed in the previous assembly operations. When the required dose is in the arc tube, the fill tube is sealed by melting the fill tube near the wall. The Krypton is thus sealed within the inner arc tube. The inner tube is then mounted in the outer tube, the ends sealed and an inert gas fill introduced into the outer envelope through a fill tube which is melted closed when required pressure is achieved.

4. PROCEDURES AND RESULTS OF PROTOTYPE TESTING DEMONSTRATING THAT THE MATERIAL WILL NOT BECOME DETACHED FROM THE PRODUCT AND THAT THE BY-PRODUCT MATERIAL WILL NOT BE RELEASED TO THE ENVIRONMENT.

Careful testing during manufacture of the arc tubes and the finished lamps assures that the products will not threaten a release to the environment. These tests are described below.

5. QUALITY CONTROL PROCEDURES TO BE FOLLOWED IN THE FABRICATION OF PRODUCTION LOTS OF THE PRODUCT.

Before dosing/exhausting, each arc tube is leak checked on a leak detector to make sure the press seals and tubulation attachment are leak tight. In the dosing/exhausting step, but before dosing, each arc tube is again leak checked by making sure the exhaust manifold pumps down properly. In the outer exhaust process, each outer tube is leak checked by making sure the exhaust manifold pumps down properly; in this step, the dosed and tipped off arc tube is contained within the outer bulb. Each exhausted lamp is seasoned (burned) for 12 to 15 minutes and is observed for color measurements while operating; any leak would be apparent to the eye (in the form of salt deposits on the outer bulb) and would also show up in an abnormal color reading which would result in a lamp quality rejection. (Note: The outer bulbs in the TD lamps are evacuated, enhancing the color shift due to a leak.)

6. THE PROPOSED METHOD OF LABELING.

The completed lamps are sold mainly to commercial customers. Some lamps are individually packaged while other lamps are sold in bulk cartons.

The lamps placed in individual packages will include a marking on the outside of each individually packaged lamp that reads as follows:

"The lamp contains an arc tube with a filling gas containing Kr-85 and is distributed by Philips Lighting Company, a Division of North American Philips Corporation."

Philips Lighting Company will include a marking on the outside of its lamp bulk pack that reads as follows:

"Each lamp contains an arc tube with a filling gas containing Kr-85 and is distributed by Philips Lighting Company, a Division of North American Philips Corporation."

This type of marking is consistent with markings of similar lamps distributed by other lamp companies in the U.S.

7. RADIATION LEVELS AND METHODS OF MEASUREMENT.

Attempts have been made to measure the radiation level measurable through the arc tube wall. A 514 KeV gammo-intensity source aided by a Ge(Li) detector was used. The readings were:

MHN-T	70W	1080 Bq	(28 nCi)
MHN-TD	70W	450 Bq	(11.8 nCi)
MHN-TD	150W	1530 Bq	(40 nCi)

Direct measurement of the radiation at the lamp outside surface demonstrated no measurable radiation; this means less than .01 mrem/hr.

Calculation of a theoretical radiation level based on 2500 Bq (65 nCi) filling (more than these lamps have) was done as follows:

The contribution by the 514 KeV gamma source is .0007 mrem/hr. The Beta radiation is absorbed entirely. The rem-radiation generated gives maximum .0002 mrem/hr. Therefore, total radiation level at the surface is approximately .001 mrem/hr.

This calculation was checked by measuring a Kr-85 source of 3.94 μ Ci in a glass capsule. A value of .027 mrem/hr was measured. Scaling this to our 2500 Bq (65 nCi) theoretical model gives .0005 mrem/hr (close enough to our .001 estimate).

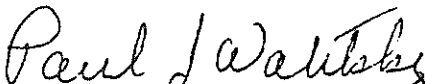
All of the Beta radiation should be absorbed by the quartz arc tube wall. To ensure this, the wall must be 1-1.2 mm thick. See Section 2. Our wall thicknesses are all greater than 1.2 mm.

The lamps will be made with wattages of 70, 150 and 250. The maximum number of lamps at any one time in the warehouses is estimated at 50,000 70 watt, 50,000 150 watt and 5,000 250 watt. Therefore, the maximum amount of Krypton-85 at the warehouses would be $(50,000 \times .030 \text{ nCi} + 50,000 \times .090 \text{ nCi} = 5,000 \times .2 \text{ nCi}) = 7 \text{ millicuries}$. *should be micro Ci # 10/15/89*

Therefore, we respectfully request an amendment to our Federal radioactive material license to increase the maximum amount of Krypton-85 from 45 millicuries to 52 millicuries that may be stored in our licensed warehouses and distributed to persons exempt from licensing. To the extent that various Agreement States require amendments to our various State licenses Philips Lighting will make due application to comply with that Agreement State's requirements.

Enclosed is a check for \$240.00 for processing of this application for an amendment. If there is any further information you need to complete your review, please let us know so we may expeditiously reply.

Respectfully,

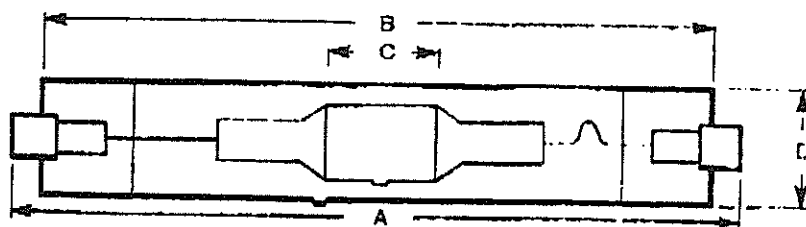

Paul J. Walitsky, C.H.M.M.
Environmental Engineer

PJW:amp

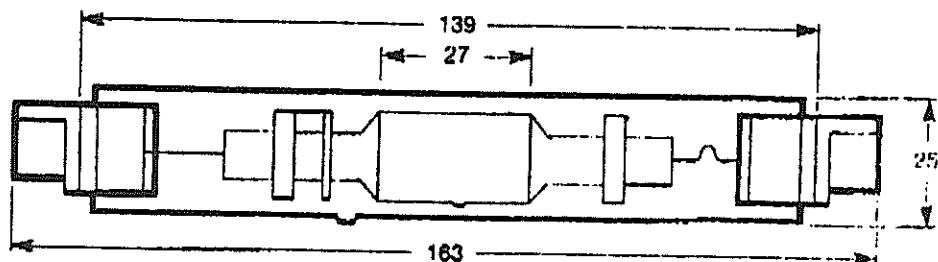
cc: Jack Michael
Gene Truncellito

Dimensions

	A	B	C	D
MHW-TD 70W	114	115	7	20
MHN-TD 150W	132	125	18	23



MHN-TD 250W



Ordering and packing data

Lamp designation	Ordering number	Nett weight g	Packing unit			
			Qty	Weight kg	Dimensions cm	Volume m ³
MHW-TD 70W	9280 768 000..	20	12	0.65	18 x 14 x 20	0.005
MHN-TD 150W	9280 762 000..	32	12	0.80	18 x 14 x 20	0.005
MHN-TD 250W	9280 763 000..	55	12	1.07	18 x 14 x 21	0.005



PHILIPS

Philips Lighting

April 8, 1991

Ms. Susan Greene
Nuclear Regulatory Commission
Medical, Academic, and Commercial
use Safety Branch
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety and
Safeguards
Washington D.C. 20555

See Reports

Dear Ms. Greene:

In accord with our conversation we have compiled additional data on the distribution portion of the license applications. In addition we have enclosed reports by Canberra Industries concerning three sites: Lynn, Massachusetts, Kansas City, MO. and Corn Road, South Brunswick, N.J. These were formerly storage sites which are no longer in use. The Canberra reports certify their release for unrestricted use. The last enclosure is a copy of Mr. Lorentz's certification from the Harvard School of Public Health. *maintained in file no. 29-20609-03*

Summary of NRC license 29-20609-02

The NRC license, as amended authorizes Philips Lighting Company, a Division of North American Philips Corporation to possess and store the following products which contain krypton-85, tritium or promethium-147.

		radionuclide	max./Item
Fluorescent Starters	S2	Krypton-85	15 nCi
	S8	tritium	50 nCi
	S10	tritium	50 nCi
	S12	tritium	400 nCi
Metal Halide lamps	MHN-T	krypton-85	70,90,200 nCi
	MHN-TD	krypton-85	70,90,200 nCi
Compact Fluorescent lamps	SL * 18	tritium	110 nCi
	PL 5-13W	krypton-85	30 nCi
	PLC	krypton-85	30 nanocuries
	PLC	Promethium	330 nanocuries
High Pressure Sodium lamps		tritium	400 nanocuries

Philips Lighting Company
A Division of North American Philips Corporation
200 Franklin Square Drive, P.O. Box 6800
Somerset, NJ 08875-6800

M1012430082

The fluorescent lamp starters, compact fluorescent lamps and High Pressure sodium lamps all contain a glass glow switch. The glow switch is contained within a polycarbonate container in the case of the starters. In the lamp configuration the glow switch is found is the base of the lamp. The glow switch is described in detail below. The Metal Halide lamps contain krypton-85 inside the inner arc tube (quartz). This arc tube is inside an outer arc tube also composed of quartz.

All of these items, except the pr-147 containing lamps, are currently manufactured by N.V. Philips Gloeilampen Fabrieken (N.V. Philips) Eindhoven, The Netherlands. The Pr-147 lamps are manufactured by Matsushita Electronics Corporation ("MEC") in Japan under license from NV Philips.

Requirements of 10 CFR 32.14

1. Chemical and physical form and maximum quantity of by product material in each product.
2. Details of Construction
Glow Switch

The glow switch is used in the starting circuit of the lamp or starter. The discharge is started when the glow switch opens, supplying a high voltage to the lamp from an external ballast. krypton-85, hydrogen-3 or promethium-147 is used in the switch to initiate the ionization of the neon/argon filling gas and serves to insure predictable operation of the switch. In the high pressure sodium lamp the switch is attached between the arc tube and lamp stem, and the sealed glow switch capsule is fully enclosed within the sealed outer bulb of the lamp. The glow switch is a fusion sealed 20% lead glass having a nominal wall thickness of .016 inches-.032 inches. The outer bulb is typically made of boro silicate glass having a nominal thickness of .025 inches.

In the compact fluorscent lamp the switch is attached to the bottom of the lamp in such a way that it is protected by a protrusion of the rigid plastic base.

3. The method of containment or binding of the by-product material in the product.

The tritium is adsorbed on a titanium substrate, and this material is contained within a fusion-sealed 20% lead glass capsule having a nominal wall thickness of .032 inches. In the case of the starters the glow switch is sealed in a white polycarbonate cannister.

The nickel plated promethium-147 lead wire is contained in a fusion-sealed lead glass capsule which has a nominal wall thickness of approximately .016 inches.

The krypton gas mixture in the glow switch is contained in a fusion-sealed lead glass capsule having a nominal wall thickness of .016 inches.

4. Procedures and results of prototype testing demonstrating that the material will not become detached from the product.

Careful testing during manufacture of the glow switches and the finished lamps assures that the products will not threaten a release to the environment.

5. Quality control procedures to be followed in the fabrication of the production lots of the product.

A sample of the completed glow switches is subjected to an endurance test by N.V. Philips immediately following fabrication. This test consists of 2,000 cycles in which during each cycle the switch is turned on for 3 seconds and then turned off for 27 seconds. This test reveals the integrity of the glow switch.

In addition after 500 hours of storage, a sample of the switches is tested by N.V. Philips with a spark coil to determine whether the switch is a "slow leaker". The test consists of the observation of the color of the discharge that is initiated by the spark coil. It is estimated that a change in the filling gas of 20 ppm (or more) can be detected using this test. Past testing results have for example shown that of 3,643 switches tested over a seven month period none were slow leakers.

The activity of every bottle of the tritium and every tank of krypton gas is checked at a gas plant operated by N.V. Philips using a Berthold Radiation Measuring Instrument (model LB 1200). The bottles and tanks are checked again before the material is used in the production of the switches with the same model instrument. The fill pressure of the completed switches is checked with a McCleod gauge during production using sample of approximately 3 per 10,000 switches.

Finally in the course of manufacturing lamp in the Netherlands, Japan or Mexico every lamp is tested at the end of the production line to assure that the lamps operate. If the flow switch is defective for example, because the switch is a "slow leaker" the lamp will not operate and the lamp is rejected.

6. Proposed method of labeling.

The completed lamps are sold mainly to commercial customers although some items are sold in blister packs to the retail market.

Individual packs, cartons, and boxes all contain markings which are described below.

1. High pressure sodium lamps - (Letter May 26, 1988) the completed lamps are sold mainly to commercial customers. Some lamps are individually packaged, while other lamps are sold in bulk cartons.

For the lamps placed in individual packages, Philips Lighting includes a marking on the outside of each individually packaged lamp that reads as follows.

"The lamps uses a glow switch containing less than 400 nCi of ^3H and is distributed by Philips Lighting Company a division of North American Philips Corporation."

Philips Lighting Company will include a marking on the outside of its' bulk pack that reads as follows:
"Each lamp uses a glow switch containing less than 400 nCi of ^3H and is distributed by Philips Lighting Company, a division of North American Philips Corporation.

2. PL lamps (16, 22, 28 watt) produced by Matsushita (letter of 8/7/87). The completed lamps are sold for the most part to commercial customers. Some lamps are sold in "Bulk Pack" a 50 lamp carton in which the lamps are placed in trays within the carton. For the lamps placed in individual packages, PLC will include a marking on the outside of each individually packaged lamp that reads as follows:

" This lamp uses a glow switch containing less than 0.33 micro-Ci PM-147 and is distributed by Philips Lighting Company, a division of North American Philips Corporation."

Philips will include a marking on the outside of its bulk pack that reads as follows:

"Each lamp uses a glow switch containing less than 0.33 micro-ci PM-147 and is distributed by Philips Lighting Company a division of North American Philips Corporation."

3. PL lamps 5, 7, 9, 13 watt (letter 2/26/85) bulk pack (50 lamps in individual cartons) in a cardboard carton that reads: (on the outside of the carton). "Each lamps uses a glow switch containing less than 15 nCi of Kr-85 and is distributed by Philips Lighting Company, a division of North American Philips Corproation." Further, the packaging for each of the individually packaged lamps (i.e. each lamp in the 60-lamp carton and each lamp in a blister pack) will include the following marking:

" This lamp contains a glow switch containing less than 15 nCi of Kr-85 and is distributed by Philips Lighting Company, a division of North American Philips Corporation."

4. PL lamps 10, 13, 18 and 26 watt (letter of June 17, 1986) These lamps as per the June 17, 1987 letter contained less than 500 nCi of H. this has now been reduced to less than 50 nCi of H. Therefore the markings described in the June 17 letter have been changed to reflect the lower loading.

The completed lamps are sold for the most part to commercial customers. Some lamps are individually packaged. Other lamps are sold in a bulk pack - a 50 lamp carton in which the lamps are placed within the carton in trays, but in which each lamp is not placed in an individual package. Philips will include a marking on the outside of each individually packaged lamp that reads as follows:

" This lamp uses a glow switch containing less than 50 nCi of H and is distributed by Philips Lighting Company, a division of North American Philips Corproation."

Philips will include a marking on the outside of its bulk pack that reads as follows:

"Each lamp contains a glow switch containing less than 50 nCi of H and is distributed by Philips Lighting Company, a division of North American Philips Corporation."

5. This same letter of June 17, 1986 describes the request to store 1,750,000 glow switches in Lynn Massachusetts. As we mention above the Lynn Facility has been shut down. Bulk warehousing of glow switches will be done at Lewiston Maine. Switches will be brought in from the Netherlands for distribution to the other lamp companies for incorporation into their lamps. Generally shipments are of 150,000 pieces (40 cases). We do not anticipate storing more than 450,000 units. Each case in the shipment will contain 3,750 glow switches. The case will have a marking which reads:

"Each glow switch contains less than 15 nCi of Kr-85 and is distributed by Philips Lighting Company, a division of North American Philips Corporation."

If the glow switch is of the tritium type, the marking will substitute 50 nCi of ^3H for the Kr-85 information.

6. Fluorescent lamp starters (letters of October 15, 1990 and January 19, 1990)

The fluorescent lamp starters are sold to industrial, commercial and consumer accounts. Packaging variations reflect the various markets.

The S2 starter is sold in a blister pack containing 2 starters; there are 6 blisters per box and 15 boxes per case. Each packaging unit, the blister, the box and the case will include a marking on the outside surface that reads as follows:

" Each starter contains a glow switch containing less than 15 nCi of Kr-85 and is distributed by Philips Lighting Company, a division of North American Philips Corporation."

The S2 is also sold in a 10-pack containing 10 starters. There are 20 packs in each case. Each 10-pack and each case will include a marking on the outer surface that reads identical to above paragraph.

The S2 is sold in a "luxury pack" of 25 starters. There are 20 boxes of "luxury pack" per case. Each "luxury pack" and each luxury pack case will include a marking on the outer surface which reads identical to the above paragraph 6.1.

The S2 starter is also sold in a bulk pack of 1,000 starters in one carton. The carton outer surface will bear a marking identical to the above paragraph.

The S8 and S10 packing are as described in the letter of January 19, 1990.

The marking on the "luxury pack" (25 starters), Blister pack, (2 starters) Blister pack box (6 Blisters), case (15 blister pack boxes), luxury pack case (20 luxury packs) and bulk pack (1000 starters) will include a marking on the outer surface that reads as follows:

"Each starter contains a glow switch containing less than 50 nCi of H^3 and is distributed by Philips Lighting Company, a division of North American Philips Corporation.

The S12 starter is sold in a "luxury pack" of 25 starters per box, 20 boxes per case, a bulk pack of 1000 starters per box and a 10 pack with 10 starters per pack and 20 packs per box. Each luxury pack, 10 pack, box and case will include a marking on the outer surface that reads as follows:

"Each starter contains a glow switch containing less than 400 nCi of H^3 and is distributed by Philips Lighting Company, a division of North American Philips Corporation."

7. The SL*18 Magnetic lamp was described in a letter of September 29, 1988. This energy saving lamp is being superseded by the electronic version which eliminates the glow switch, however, we still have stock in some of the warehouses. The packaging for the SL*18 magnetic is as follows:

All lamps are individually packaged and sold in bulk cartons of four or six lamps each.

Philips Lighting will include a marking on the outside of each individually packaged lamp that reads as follows:

"This lamp uses a glow switch containing less than 110 nCi of H^3 and is distributed by Philips Lighting Company, P.O. Box 6800, Somerset, N.J. 08875-6800, a Division of North American Philips Corporation."

Philips Lighting will include a marking on the outside of its bulk pack that reads as follows:

"Each lamp uses a glow switch containing less than 110 nCi of H^3 and is distributed by Philips Lighting Company, P.O. Box 6800, Somerset, N.J. 08875-6800, A Division of North American Philips Corporation."

8. The MHN lamps are metal halide lamps which have Kr-85 in the arc tube. The loading increases with wattage. (letter of 9/6/89). The accepted method of labeling is described below.

The completed lamps are sold mainly to commercial customers. Some lamps are individually packaged while other lamps are sold in bulk cartons.

The lamps placed in individual packages will include a marking on the outside of each individually packaged lamp that reads as follows:

" The lamp contains an arc tube with a filling gas containing Kr-85 and is distributed by Philips Lighting Company, a Division of North American Philips Corporation."

Philips Lighting Company will include a marking on the outside of its lamp bulk pack that reads as follows:

"Each lamp contains an arc tube with a filling gas containing Kr-85 and is distributed by Philips Lighting Company, a Division of North American Philips Corporation."

This type of marking is consistent with markings of similar lamps distributed by other lamp companies in the U.S.

Warehouse stocking - Distributed throughout the listed sites.

<u>ITEM</u>	<u>LOADING</u>	<u>ISOTOPE</u>	<u># OF PIECES</u>	<u>TOTAL</u>
1. High Pressure Sodium	.48uCi (400nCi)	Kr-85	150,000	60mCi
2. PL - 16, 22, 28	.33uCi (33nCi)	Pm-147	150,000	49.5
3. PL - 5, 7, 9, 13	.015uCi (15nCi)	Kr-85	2,000,000	30
4. PL - 10, 13, 18, 26 watt	.05uCi (50nCi)	H ³	1,000,000	50
5. Glow Switches	.015uCi (15nCi)	Kr-85	450,000	6.75
6. S2	.015uCi (15nCi)	Kr-85	4,000,000	60
S8	.05uCi (50nCi)	H ³	1,000,000	50
S10	.05uCi (50nCi)	H ³	1,000,000	50
S12	.4uCi (400nCi)	H ³	250,000	100

<u>ITEM</u>	<u>LOADING</u>	<u>ISOTOPE</u>	<u># OF PIECES</u>	<u>TOTAL</u>
7. SL-18	.110uCi (110nCi)	H ³	100,000	11.0 mCi
8. MHN 70 Watt	.030uCi (30nCi)	Kr-85	50,000	1.5
150 Watt	.090uCi (90nCi)	Kr-85	50,000	4.5
250 Watt	.200uCi (200nCi)	kr-85	5,000	1.0

TOTAL ISOTOPE QUANTITIES

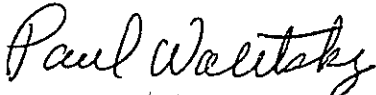
<u>Kr-85 mCi</u>	<u>H³ mCi</u>	<u>Pm-147mCi</u>
60		49.5
30		
50		
6.75		
60	50	
	50	
	100	
	11	
1.5		
4.5		
<u>1.0</u>		
163.75 mCi	261 mCi	49.5 mCi

The total for Pm-147 matches our current license allocation. The H³ is about 25% of current allowed limits, the discrepancy is due to the reduction of H³ loading from 500 to 50 nCi in a major lamp type. We would like to retain some measure of leaway to allow increases in inventory above those contemplated. Perhaps a level near our currently authorized level of 930 mCi could be granted. The total of Kr-85 is above the currently authorized level of 112 mCi.

This is due to our desire to import and distribute glow switches as separate components. We currently have been acting to facilitate imports to other lamp companies using their licenses. This change would allow us to directly import and warehouse the switches. We respectfully request that our Kr-85 level be increased to a maximum level of 175 mCi.

If you need additional information don't hesitate to contact me at (908) 563-3197. Thank you for your cooperation and help.

Very truly yours,

A handwritten signature in cursive script that reads "Paul Walitsky".

Paul Walitsky, CHMM
Radiation Safety Officer

PW/kc

PHILIPS

Philips Lighting

Susan Greene
U.S. Nuclear Regulatory Commission
Washington D.C., 20555

October 2, 1992

Re: Additional Data MSR, SN, HPM, HPA lamps
License 29-20609-02E

Dear Susan,

I have decided obtained information from the European catalogs concerning the lamps being added to the possession and distribution licenses.

These lamps are almost exclusively used in commercial and industrial settings.

MSR: Lamps are used for television studio lighting, film and theater lighting and projectors. They are similar to the previous licensed MHN lamps in that the Kr-85 is in the inner arc tube which is mounted inside the outer bulb. The difference between the two lamps is that the MSR is a single ended lamp while the MHN has electrical connections at both ends. A catalog page is attached.

I have noted that some of the wattages listed in our application are not shown in the catalog. These are newer versions for which catalog pages have yet been prepared. A table showing wattages and KR-85 loadings is attached.

MSD: The lamp is very similar to the MSR with longer life. There was no published data available. The table attached shows a single MSD lamp of 200 watts.

SN: These lamps are used for projection studio and stage lighting, microscopy and copyboard lighting. These are also arc tubes within outer bulbs. They

Philips Lighting Company

A Division of North American Philips Corporation

200 Franklin Square Drive • P.O. Box 6800
Somerset, New Jersey 08875-6800



1410124130070

are single ended. A catalog page is attached. Here too, the krypton is in the inner tube.

HPM: These lamps are used for photochemical processes. The lamp is a quartz arc tube and is designed to be mounted in a fixture which focuses the ultraviolet wavelengths to circuits or micro-fiche. The Kr-85 is in the arc tube. These are double ended lamps similar to the previously licensed MHN lamps. In this lamp there is no inner tube. Catalog pages are attached.

HPA: These lamps are similar to the HPM configuration. They are used for photochemical processes in the reprographic industry, UV lacquer curing and printed circuits. These lamps are mounted in fixtures or equipment which are part of the industrial process. Philips will not sell these lamps for suntanning purposes. This is a single tube and the KR-85 is in the arc tube. Catalog pages are attached.

Very truly yours,



Paul Walitsky, CHMM
Radiation Safety Officer
Manager of Environmental Affairs

A new distribution center is being opened at Mountaintop, PA. We would like to add this new location to the license as well. The address is :

Crestwood Industrial Park
1 Moran Drive
Mountaintop, PA 18707

Authorization Amounts (Line 8):

Philips Lighting Company wishes to import ^{+DISTRIBUTE} several lamp types from Belgium (Philips Lighting, Turnhout) which contain Krypton-85 (See Table 1 for lamp types, packaging and loading per lamp). Table 2 will show the warehouse quantities required. Table 3 lists the warehouse locations. If by the Agreement state limit increases are needed appropriate amendment applications will be made.

The same quality control procedures described in our amendment adding the MHN lamps are followed for these lamps. They are all produced in the same facility.

Labeling will use the same wording previously approved for the MHN. The label will appear on all individual lamp packages and on the outer cartons.

The wording reads as follows:

"This lamp contains an arc tube with a filling gas containing KR-85 and is distributed by Philips Lighting Company, a division of North American Philips Lighting Corporation."

Table 1:

TYPES/WATTS	PACKAGING	ACTIVITY nCi
MSR-200	4 PACK	9.5
MSR-200-HR	4 PACK	9.5
MSR-400	4 PACK	24.0
MSR-575	4 PACK	60.0
MSR-700	4 PACK	80.0
MSR-1200	4 PACK	150
MSR-2500	4 PACK	250
MSR-4000	1 PACK	625
MSR-200-SA	4 PACK	9.5
MSD-200	4 PACK	26.0
SN-250	4 PACK	20.0

Table 1 (CONTINUED):

TYPES/WATTS	PACKAGING	ACTIVITY nCi
SN-500	4 PACK	80.0
SN-600	4 PACK	150
SN-1000	10 PACK	250
SN-500-507	4 PACK	80
HPM-10	4 PACK	11
HPM-12	4 PACK	.3
HPM-13	4 PACK	.5
HPM-14	4 PACK	.7
HPM-15	4 PACK	.5
HPM-16	4 PACK	.2
HPM-17	4 PACK	.5
HPM-17/OLEL	4 PACK	.5
HPM-19	4 PACK	.5
HPM-19/C	4 PACK	.5
HPM-4020	4 PACK	17
HPM-4000	4 PACK	.1
HPM-3000	4 PACK	11
HPM-L-1250-R	4 PACK	12
HPM-20/20C	4 PACK	15.3
HPM-25	4 PACK	.4
HPM-30	4 PACK	.9
HPM-1001	4 PACK	12.5
HPM-2010	4 PACK	16
HPA-400	4 PACK	12.5
HPA-400/305	4 PACK	9.0
HPA-400/30 SA	4 PACK	5.0
HPA-1000	4 PACK	1.6
HPA-1200S	4 PACK	17.0
HPA-1000/20	4 PACK	.3

Table 1 (CONTINUED):

TYPE/WATTS	PACKAGING	ACTIVITY nCi
HPA-1200-R	4 PACK	.4
HPA-2000	4 PACK	1.2
HPA-2000-R	4 PACK	N/A
HPA-2000-S	4 PACK	.2
HPA-1001-R	4 PACK	12.4
HPA-2010-R	4 PACK	16
HPA-3000-R	4 PACK	11
HPA-4020-R	4 PACK	17
HPA-419-R	4 PACK	9
HPA-1019-R	4 PACK	18
HPA-5005-R	4 PACK	48

Table 2:

TYPE/WATTS	nCi	QUANTITY	Total uCi
MSR-200	9.5	10	.095
MSR-200-HR	9.5	75	.712
MSR-400	24	500	.712
MSR-575	60	100	12
MSR-700	80	5000	400
MSR-1200	150	100	15
MSR-2500	250	500	125
MSR-4000	625	150	93.75
MSR-400-SA	9.5	100	.95
MSD-200	26	100	2.6
SN-250	20	50	1
SN-500	80	100	8
SN-660	150	50	7.5
SN-1000	250	50	12.5
SN-500-507	80	100	8
HPM-10	11	500	5.5
HPM-12	.3	500	.15
HPM-13	.5	50	.025
HPM-14	.7	250	.175
HPM-15	.5	300	.150
HPM-16	.2	250	.05
HPM-17	.5	500	.250
HPM-17/OLEC	.5	5000	2.5
HPM-19	.5	100	.05
HPM-19/C	.5	100	.050
HPM-L1250R	12	5000	60
HPM-L1250	12	1000	12
HPM-20/20C	15.3	300	4.6
HPM-25	.4	250	.1
HPM-30	.9	250	.225

Table 2 (Continued):

TYPE/WATTS	nCi	QUANTITY	Total uCi
HPM-1001	12.5	250	3.125
HPM-2010	16	250	4
HPM-3000	11	250	2.75
HPM-4000	.1	250	.025
HPM-4020	17	250	4.250
HPA-400	12.5	500	6.2
HPA-400/305(C)	9	250	2.25
HPA-400/305A	5	500	2.5
HPA-1000/100S	.6	200	.12
HPA-1200S	17	250	4.250
HPA-1000/20	.3	250	.075
HPA-1200R	.4	250	.100
HPA-2000	1.2	250	.3
HPA-200R	.2	200	.040
HPA-2000S	.2	250	.05
HPA-1001R	12.4	250	3.10
HPA-2010R	16	250	4
HPA-3000R	11	250	2.75
HPA-4020R	17	250	4.25
HPA-419R	9	250	2.25
HPA-1019R	18	250	4.5
HPA-5005R	48.02	250	12

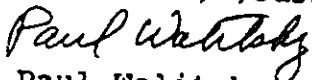
Table 3 :

WAREHOUSE LOCATIONS	
1)	Docks Corner Rd., South Brunswick N.J.
2)	4875 West Park Dr., Atlanta GA
3)	601 Meadowlands Blvd., Meadowlands PA
4)	Hoult Rd., Fairmont W.V.
5)	1435 Bradley Lane, Carrollton TX
6)	7800 District Blvd., Bakersfield CA
7)	440 N. Medinah Rd., Roselle IL
8)	23rd St. & Duss Ave., Ambridge PA
9)	3861 South 9th St., Salina KS
10)	Crestwood Industrial Park, 1 Moran Dr., Mountain Top PA

The total increase in loading is estimated to be 830.5 micro curies or .830 mCi. It should be noted that the 4000watt MSR lamp contains approximately 625 nCi. This represents an increase in maximum individual unit loading. We hereby apply for an amendment to reflect the changes in location, an increase of 830.5 micro curies and an increase to 625 nano curies maximum per lamp.

If you have any questions please do not hesitate to contact me at (908) 563-3197.

Very truly yours,



Paul Walitsky, CHMM
Radiation Safety Officer
Manager of Environmental Affairs

cc: Susan Greene, NCR Washington D.C.



PHILIPS

Philips Lighting

January 12, 1993

Ms. Susan Greene
U.S. Nuclear Regulatory Commission
Washington D.C. 20555

RE: License 29-20609-02E

Dear Ms. Greene:

Philips Lighting Company, a Division of North American Philips Corporation hereby requests an amendment to our license. Philips (PLC) proposes to import/distribute from N.V. Philips Electronics B.V., Eindhoven, the Netherlands a new lamp known as "QL" the lamp is a new type of lightbulb which uses radio frequency to excite mercury which in turn causes a phosphor to emit visible light. This lamp has an extremely long life of the order of 60,000 hours.

The 85 watt QL lamp is the first in what may be a series of wattages. The lamp contains less than 225 nCi of Kr-85. The Kr-85 is contained within the lamp in similar fashion to the HPM and HPA lamps licensed in the pervious amendment.

The lamps will be stored and distributed through the warehouse locations licensed for handling of our existing lamp types.

In support of the amendment to distributed these lamp we submit the following information.

- 1) Chemical and Physical From and maximum Quantity of by-Product material in each product.

Each QL 85 watt contains less than 225 nCi (nano curies) of Kr-85. Each QL 55 watt contains less than 150 nCi of Kr-85. This material is a gas.

- 2) Details of construction
A brochure is enclosed which describes the QL lamp. Page 3 shows the details of construction.

Philips Lighting Company

A Division of North American Philips Corporation

200 Franklin Square Drive • P.O. Box 6800
Somerset, New Jersey 08875-6800



3) Method of Containment

The Kr-85 is inside the glass envelope. Because of the extremely long life of these lamps they are ideally suited for installation in high or difficult to reach fixtures. For this reason this lamp must be located in areas where service breakage will not be a consideration. These lamps should burn for 10 years or more without replacement.

4) Procedures for demonstrating that the by-product will not become detached from the product. The lamps will all be tested in Europe before shipping to the U.S. lamps which exhibit leakage will not start. Therefore only intact lamps will be shipped to the U.S.

5) Quality Control

Quality control procedures are identical to those described in previous applications. The activity of every bottle of Kr-85 is checked using a Berthold Radiation measuring instrument. (model LB 1200). Lamp dosage is controlled and measure.

6) Proposed Labeling

All lamps are individually packaged.

Philips Lighting will include a marking on the outside of each individually packaged lamp that reads as follows.

This lamp contains less than 225 nCi (or 150 nCi) of Kr-85 and is distributed by Philips Lighting Company, a Division of North American Philips Corporation.

This same wording will be used for any outer cartons which might be used to house multiple lamp packages.

7) Radiation Levels

The radiation exposure (in microsievert per year) caused by these QLS is 0.01 Sv at a distance of 2 meters. This is five-millionths part of the radiation exposure for normal surroundings which is about 2000 Sv in one year.

A second part of this amendment is concerned with locations of distribution. As noted in a previous conversation we have decided to close our South Brunswick location. All materials have been removed and a radiation survey completed by Canberra Industries (Nuclear Services Division). The results of the survey will be forwarded as soon as available.

Similarly we are closing our Tukwila Washington location. A survey has been completed there and will be forwarded to you when available.

We have applied to the state of Washington for permission to distribute product at a location in Seattle, United Warehouses, 1750 occidental Avenue South Seattle Washington, Wa 98134. We will apply to amend our distribution license to reflect this change.

A forth change in location is being applied for we would like to reactivate use of our previously licensed location in Fullerton California; 2100 East Valencia Drive Suite A.

Summary

Requested change in license 29-20609-03

Item 6 A

QL 85 Watt	225 nCi (1000 lamps) = 225 nCi
QL 55 Watt	150 nCi (5000 lamps) = <u>750</u> nCi
	995 nCi

Total requested increase allowed is 1 millicurie to a new total of 201 millicuries.

Change Item 10

Delete Docks Corner Road, South Brunswick

We appreciate your assistance. A check for \$370.00 is enclosed for the amendment fee. If you have any questions please don 't hesitate to contact me at 908-563-3197.

Very truly yours,

Paul Walitsky/H.C.

Paul Walitsky, CHMM
Radiation Safety Officer
Manager Environmental Affairs