

95

RECORD #95

TITLE: Distribution of Products Irradiated in Research Reactors

FICHE: 68475-001



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

June 25, 1986

*Bob - position file?*  
*yes, please*  
*#96 with this*  
*68475-001*

TO ALL NON-POWER REACTOR LICENSEES

Gentlemen:

SUBJECT: DISTRIBUTION OF PRODUCTS IRRADIATED IN RESEARCH REACTORS  
(GENERIC LETTER 86-11)

We have recently received several inquiries regarding products which are irradiated in research reactors and subsequently distributed to unlicensed persons. The inquiries were related to irradiations of gems and silicon chips, but other products may also be involved.

We are concerned that research reactor licensees may be irradiating and redistributing products containing induced radioactivity to unlicensed receivers who utilize or redistribute these irradiated products. Information provided to NRC in specific cases indicates that gems, silicon chips, and many other materials usually acquire relatively long-lived induced radioactivity when irradiated in a reactor. Although irradiation of products in a reactor is not of itself prohibited, 10 CFR Section 30.14 prohibits introduction of byproduct material into a product for distribution to an unlicensed person, unless the distributor has a specific license issued pursuant to 10 CFR Section 32.11 which permits such distribution.

The purpose of this Generic Letter is to correct any misunderstanding concerning the distribution of irradiated products to unlicensed persons. In accordance with 10 CFR 30.14, the distribution of irradiated materials, even with low levels of induced radioactivity, to unlicensed persons is prohibited unless the distributor of such materials is licensed by the NRC to do so. Furthermore, to measure these low levels of induced radioactivity very sensitive low background instruments are required, such as shielded sodium iodide or germanium-lithium detection systems.

In addition, we call your attention to subsection 3 of the enclosed NRC Policy Statement in the Federal Register notice of March 16, 1965 (30 FR 3462) regarding products which are toys, novelties or adornments. The staff considers gems to be adornments and has not granted licenses for distribution of irradiated gems or similar materials.

You are responsible for assuring that the distributors of any products you have irradiated in your reactor, and which have acquired induced radioactivity, are licensed to distribute these products in accordance with 10 CFR 30.14(c) and 30.31. If you directly distribute the irradiated products to unlicensed persons, you must obtain a new license to reflect this activity.

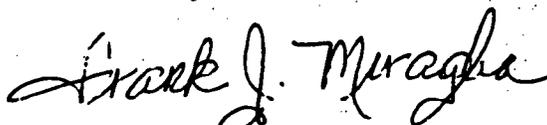
Applications should be addressed as follows:

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

Please note that the NRC has exclusive jurisdiction over reactors and distribution of radioactive consumer products. Agreement States do not issue this type of license.

This letter is for information only and does not require any response. Should you have any questions concerning this matter, please contact Harold Bernard at (301) 492-8529.

Sincerely,

A handwritten signature in black ink, reading "Frank J. Miraglia". The signature is written in a cursive style with a large, prominent initial "F".

Frank J. Miraglia, Director  
Division of PWR Licensing-B  
Office of Nuclear Reactor Regulation

Enclosure:  
As stated

**RICHARD V. FORD****Statement of Changes in Financial Interests**

In accordance with the requirements of section 710(b) (8) of the Defense Production Act of 1950, as amended, and Executive Order 10447 of November 28, 1955, the following changes have taken place in my financial interests as reported in the FEDERAL REGISTER during the past six months:

- A. Deletions: Smith, Kline, and French.  
B. Additions: None.

This statement is made as of February 24, 1965.

RICHARD V. FORD.

FEBRUARY 24, 1965.

(F.R. Doc. 65-9235; Filed, Mar. 15, 1965; 8:45 a.m.)

**RICHARD P. STEINER****Statement of Changes in Financial Interests**

In accordance with the requirements of section 710(b) (8) of the Defense Production Act of 1950, as amended, and Executive Order 10447 of November 28, 1955, the following changes have taken place in my financial interests as reported in the FEDERAL REGISTER during the past six months:

- A. Deletions: No change.  
B. Additions: No change.

This statement is made as of February 21, 1965.

RICHARD P. STEINER.

FEBRUARY 21, 1965.

(F.R. Doc. 65-9235; Filed, Mar. 15, 1965; 8:45 a.m.)

**ATOMIC ENERGY COMMISSION****USE OF BYPRODUCT MATERIAL AND SOURCE MATERIAL****Products Intended for Use by General Public (Consumer Products)**

*Criteria for the approval of products intended for use by the general public containing byproduct material and source material.* This notice sets forth the essential terms of the Commission's policy with respect to approval of the use of byproduct material and source material in products intended for use by the general public (consumer products) without the imposition of regulatory controls on the consumer-user. This is accomplished by the exemption, on a case-by-case basis, of the possession and use of the approved items from the licensing requirements for byproduct and source material of the Atomic Energy Act of 1954, as amended, and of the Commission's regulations "Licensing of Byproduct Material", 10 CFR Part 30 and "Licensing of Source Material", 10 CFR Part 40.

1. At the present time it appears unlikely that the total contribution to the exposure of the general public to radiation from the use of radioactivity in

consumer products will exceed small fractions of limits recommended for exposure to radiation from all sources. Information as to total quantities of radioactive materials being used in such products and the number of items being distributed will be obtained through record-keeping and reporting requirements applicable to the manufacture and distribution of such products. If radioactive materials are used in sufficient quantities in products reaching the public so as to raise any question of population exposure becoming a significant fraction of the permissible dose to the gonads, the Commission will, at that time, reconsider its policy on the use of radioactive materials in consumer products.

2. Approval of a proposed consumer product will depend upon both associated exposures of persons to radiation and the apparent usefulness of the product. In general, risks of exposure to radiation will be considered to be acceptable if it is shown that in handling, use and disposal of the product it is unlikely that individuals in the population will receive more than a small fraction, less than a few hundredths, of individual dose limits recommended by such groups as the International Commission on Radiological Protection (ICRP), the National Council on Radiation Protection and Measurements (NCRP), and the Federal Radiation Council (FRC), and that the probability of individual doses approaching any of the specified limits is negligibly small. Otherwise, a decision will be more difficult and will require a careful weighing of all factors, including benefits that will accrue or be denied to the public as a result of the Commission's action. Factors that may be pertinent are listed in paragraphs 9 and 10, below.

3. It is considered that as a general rule products proposed for distribution will be useful to some degree. Normally the Commission will not attempt an extensive evaluation of the degree of benefit or usefulness of a product to the public. However, in cases where tangible benefits to the public are questionable and approval of such a product may result in widespread use of radioactive material, such as in common household items, the degree of usefulness and benefit that accrues to the public may be a deciding factor. In particular, the Commission considers that the use of radioactive material in toys, novelties, and adornments may be of marginal benefit.

4. Applications for approval of "off-the-shelf" items that are subject to mishandling especially by children will be approved only if they are found to combine an unusual degree of utility and safety.

5. The Commission has approved certain long standing uses of source material, most of which antedate the atomic energy program. These include:

- (1) Use of uranium to color glass and glazes for certain decorative purposes;
- (2) Thorium in various alloys and products (gas mantles, tungsten wire, welding rods, optical lenses, etc.) to impart desirable physical properties; and
- (3) Uranium and thorium in photographic film and prints.

6. The Commission has also approved the use of tritium as a substitute luminous material for the long standing use of radium for this purpose on watch and clock dials and hands.

7. The Commission has approved additional uses of byproduct and source material in consumer products. These include the following:

- (1) Tritium in automobile lock illuminators;
- (2) Tritium in balances of precision;
- (3) Ura-<sup>238</sup>m as shielding in shipping containers; and
- (4) Uranium in fire detection units.

8. In approving uses of byproduct and source materials in consumer products, the Commission establishes limits on quantities or concentrations of radioactive materials and, if appropriate, on radiation emitted. In some cases other limitations, such as quality control and testing, considered important to health and safety are also specified.

**PRINCIPAL CONSIDERATIONS WITH RESPECT TO EVALUATION OF PRODUCTS**

9. In evaluating proposals for the use of radioactive materials in consumer products the principal considerations are:

- (a) The potential external and internal exposure of individuals in the population to radiation from the handling, use and disposal of individual products;
- (b) The potential total accumulative radiation dose to individuals in the population who may be exposed to radiation from a number of products;
- (c) The long-term potential external and internal exposure of the general population from the uncontrolled disposal and dispersal into the environment of radioactive materials from products authorized by the Commission; and
- (d) The benefit that will accrue to or be denied the public because of the utility of the product by approval or disapproval of a specific product.

10. The general criteria for approval of individual products are set forth in paragraph 2, above. Detailed evaluation of potential exposures would take into consideration the following factors together with other considerations which may appear pertinent in the particular case:

- (a) The external radiation levels from the product.
- (b) The proximity of the product to human tissue during use.
- (c) The area of tissue exposed. A dose to the skin of the whole body would be considered more significant than a similar dose to a small portion of the skin of the body.
- (d) Radiotoxicity of the radionuclides.

The less toxic materials with a high permissible body burden, high concentration limit in air and water, would be considered more favorably than materials with a high radiotoxicity.

(e) The quantity of radioactive material per individual product. The smaller the quantity the more favorably would the product be considered.

(f) Form of material. Materials with a low solubility in body fluids will be considered more favorably than those with a high solubility.

(g) Containment of the material. Products which contain the material under very severe environmental conditions will be considered more favorably than those that will not contain the material under such conditions.

(h) Degree of access to product during normal handling and use. Products which are inaccessible to children and other persons during use will be considered more favorably than those that are accessible.

(Sec. 161, 66 Stat. 942; 42 U.S.C. 2201. Administrative Procedure Act, sec. 5, 66 Stat. 230; 5 U.S.C. 1003)

Dated at Washington, D.C., this 8th day of March 1965.

For the Atomic Energy Commission.  
W. B. McCook,  
Secretary.

[P.R. Doc. 65-2616; Filed, Mar. 15, 1965; 8:45 a.m.]

[Docket No. 65-54]

**OKLAHOMA STATE UNIVERSITY**  
Notice of Issuance of Construction Permit

Please take notice that no request for a formal hearing having been filed following publication of the notice of proposed action in the FEDERAL REGISTER, the Atomic Energy Commission has issued Construction Permit No. CFRP-85 authorizing Oklahoma State University to move its Model AQN-201 nuclear reactor from its present location in the Chemical Engineering Building to the new Engineering Building on the University's campus in Stillwater, Okla.

The permit, as issued, is as set forth in the Notice of Proposed Issuance of Construction Permit and Facility License Amendment published in the FEDERAL REGISTER on February 17, 1965, 30 P.R. 2162.

Dated at Bethesda, Md., this 5th day of March 1965.

For the Atomic Energy Commission.  
ROSS S. BOYS,  
Chief, Research and Power Reactor Safety Branch, Division of Reactor Licensing.

[P.R. Doc. 65-2637; Filed, Mar. 15, 1965; 8:46 a.m.]

**CIVIL AERONAUTICS BOARD**

[Docket 15911]

**AEROVIAS ECUATORIANAS, C.A.**  
Notice of Prehearing Conference

Application of Aerovias Ecuatorianas, C.A., in Docket 15911 for a foreign air permit to engage in the foreign air transportation of persons, property, and mail between any point or points in Ecuador and Miami, Fla., via Bogota, Colombia.

Notice is hereby given that a prehearing conference on the above-entitled application is assigned to be held on March

26, 1965, at 10 a.m., e.s.t., in Room 911, Universal Building, Connecticut and Florida Avenues NW., Washington, D.C., before Examiner Barron Fredericks.

Dated at Washington, D.C., March 10, 1965.

[SEAL] FRANCIS W. BROWN,  
Chief Examiner.

[P.R. Doc. 65-2626; Filed, Mar. 15, 1965; 8:46 a.m.]

[Docket 16064]

**CHICAGO HELICOPTER AIRWAYS, INC.**

Notice of Prehearing Conference

Notice is hereby given that a prehearing conference in the above-entitled matter is assigned to be held on April 15, 1965, at 10 a.m., e.s.t., in Room 911, Universal Building, Connecticut and Florida Avenues NW., Washington, D.C., before Examiner William J. Madden.

In order to facilitate the conduct of the conference, interested parties are instructed to submit to the Examiner and other parties on or before March 24, 1965: (1) Formal motions with respect to the proceeding, including motions to consolidate or expand (such motions should be filed separately and comply with the Board's Rules of Practice, with 20 copies being filed with the Docket Section); (2) proposed statements of issues; (3) proposed stipulations, if any; (4) requests for information; (5) statements of positions of parties; and (6) proposed procedural data.

Dated at Washington, D.C., March 11, 1965.

[SEAL] FRANCIS W. BROWN,  
Chief Examiner.

[P.R. Doc. 65-2626; Filed, Mar. 15, 1965; 8:46 a.m.]

[Docket 15961]

**COMPANIA PERUANA INTERNACIONAL DE AVIACION, S.A.**

Notice of Hearing

Notice hereby is given, pursuant to the provisions of the Federal Aviation Act of 1958, as amended, that a hearing in the above-entitled proceeding will be held on April 5, 1965, at 10 a.m., e.s.t., in Room 925, Universal Building, 1825 Connecticut Avenue NW., Washington, D.C., before the undersigned Examiner.

For further information regarding the issues involved herein, interested persons may refer to the various orders of the Board, the prehearing conference report, and other documents, which are on file in the Docket Section of the Civil Aeronautics Board.

Dated at Washington, D.C., March 11, 1965.

[SEAL] HERBERT K. BRYAN,  
Hearing Examiner.

[P.R. Doc. 65-2661; Filed, Mar. 15, 1965; 8:45 a.m.]

[Docket 15978]

**DEUTSCHE LUFTHANSA AKTIENGESELLSCHAFT (LUFTHANSA GERMAN AIRLINES)**

Notice of Hearing

Notice is hereby given, pursuant to the Federal Aviation Act of 1958, as amended, that a hearing in the above-entitled proceeding previously assigned to be held on June 17, 1964, has been re-assigned to be held on April 13, 1965, at 10 a.m. (local time) in Room 736, Universal Building, 1825 Connecticut Avenue NW., Washington, D.C., before Examiner Ross I. Newmann.

For information concerning the issues involved and other details in this proceeding, interested persons are referred to the Prehearing Conference Report served on April 21, 1964, and other documents which are in the docket of this proceeding on file in the Docket Section of the Civil Aeronautics Board.

Dated at Washington, D.C., March 10, 1965.

[SEAL] ROSS I. NEWMANN,  
Hearing Examiner.

[P.R. Doc. 65-2623; Filed, Mar. 15, 1965; 8:46 a.m.]

[Docket 16083]

**LOS ANGELES AIRWAYS, INC.**

Notice of Prehearing Conference

Notice is hereby given that a prehearing conference in the above-entitled matter is assigned to be held on April 13, 1965, at 10 a.m., e.s.t., in Room 911, Universal Building, Connecticut and Florida Avenues NW., Washington, D.C., before Examiner William J. Madden.

In order to facilitate the conduct of the conference, interested parties are instructed to submit to the Examiner and other parties on or before March 24, 1965: (1) Formal motions with respect to the proceeding, including motions to consolidate or expand (such motions should be filed separately and comply with the Board's Rules of Practice, with 20 copies being filed with the Docket Section); (2) proposed statements of issues; (3) proposed stipulations, if any; (4) requests for information; (5) statements of positions of parties; and (6) proposed procedural data.

Dated at Washington, D.C., March 11, 1965.

[SEAL] FRANCIS W. BROWN,  
Chief Examiner.

[P.R. Doc. 65-2626; Filed, Mar. 15, 1965; 8:46 a.m.]

[Docket 15961]

**NEW YORK AIRWAYS, INC.**

Notice of Prehearing Conference

Notice is hereby given that a prehearing conference in the above-entitled matter is assigned to be held on April 14, 1965, at 10 a.m., e.s.t., in Room 911.

List of Recently Issued Generic Letters

<u>Generic Letter No.</u>	<u>Subject</u>	<u>Date of Issuance</u>	<u>Issued To</u>
86-10	Implementation of Fire Protection Requirements	04/24/86	All Power Reactor Licensees and Applicants
86-09	Technical Resolution of Generic Issue No. B-59-(N-1) Loop Operation in BWRs and PWRs	03/31/86	All Licensees of Operating BWRs and PWRs and License Applicants
86-08	Availability of Supplement 4 to NUREG-0933 "A Prioritization of Generic Safety Issues"	03/25/86	All Licensees of Operating Reactors Applicants for OLs and Holders of CPs
86-07	Transmittal of NUREG-1190 Regarding the San Onofre Unit 1 Loss of Power and Water Hammer Event	03/20/86	All Reactor Licensees and Applicants
86-06	Implementation of TMI Action Item II.K.3.5 "Automatic Trip of Reactor Coolant Pumps"	05/29/86	All Applicants and Licensees with CE designed NSSS-except Maine Yankee
86-05	Implementation of TMI Action Item II.K.3.5, "Automatic Trip of Reactor Coolant Pumps"	05/29/86	All Applicants and Licensees with B&W Designed Nuclear Steam Supply Systems
86-04	Policy Statement on Engineering Expertise on Shift	02/13/86	All Power Reactor Licensees and Applicants for Power Reactor Licenses
86-03	Applications for License Amendments	02/10/86	All Power Reactor Licensees and OL Applicants
86-02	Technical Resolution of Generic Issue B-19 Thermal Hydraulic Stability	01/23/86	All Licensees of Operating BWRs
86-01	Safety Concerns Associated with Pipe Breaks in the BWR Scram System	01/03/86	All BWR Applicants and Licensees

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

*Handwritten: Job*

June 25, 1986

*Handwritten: H. Bernard*

MEMORANDUM FOR: All Non-Power Reactor (NPR) Project Managers  
and Regional NPR Inspectors

FROM: Frank J. Miraglia, Director  
Division of PWR Licensing-B  
Office of Nuclear Reactor Regulation

SUBJECT: TRANSMITTAL OF GENERIC LETTER 86-11, "DISTRIBUTION OF  
PRODUCTS IRRADIATED IN RESEARCH REACTORS"

The enclosed generic letter transmits to all non-power reactor licensees and applicants the subject Generic Letter. Its purpose is to inform licensees of the need for a specific license to be issued which permits distribution of products irradiated in research reactors to unlicensed receivers who utilize or redistribute these irradiated products. The generic letter is provided for information only, and does not involve any reporting requirements. Thus, no review criteria or guidance for schedule negotiations are necessary.

*Handwritten signature of Frank J. Miraglia*

Frank J. Miraglia, Director  
Division of PWR Licensing-B  
Office of Nuclear Reactor Regulation

Enclosure:  
As stated

CONTACT:  
H. Bernard, NRR  
Ext. 28529

~~my~~ maybe info  
notice is needed.  
~~John~~

Bob - This is a good & brief  
position re. exempt.  
I look for file or do  
we already have one?  
FEB 20 1986

John

MEMORANDUM FOR: Frank J. Miraglia, Director  
Division of Pressurized Water Reactor Licensing-3  
Office of Nuclear Reactor Regulation

James G. Partlow, Director  
Division of Inspection Programs  
Office of Inspection and Enforcement

FROM: Richard E. Cunningham, Director  
Division of Fuel Cycle and Material Safety  
Office of Nuclear Material Safety and Safeguards

SUBJECT: DISTRIBUTION OF PRODUCTS IRRADIATED IN REACTORS

My staff has recently received three telephone inquiries regarding products which are irradiated in research reactors and distributed to unlicensed persons. The irradiated products are either silicon chips for use in electronic products, or gems. One inquiry came from an unlicensed New York jeweler who stated he was sending topaz gems to a reactor in Tuxedo, New York for irradiation, and receiving them back "after they are no longer radioactive." We referred this specific case to Region I inspection staff for further investigation. Region I has in the past had to take enforcement action to halt import and distribution of irradiated gems in the U. S.

We are concerned that research reactor licensees, and possibly Department of Energy reactors, may be irradiating products and releasing them to unlicensed customers without properly measuring for induced radioactivity. Irradiation of products in a reactor is not itself prohibited. However, 10 CFR Section 30.14 prohibits introduction of byproduct material into a product for distribution to unlicensed persons except in accordance with a byproduct material license issued to the distributor pursuant to Section 32.11 or equivalent Agreement State regulations.

FEB 20 1986

Multiple Addressees

- 2 -

We request that you bring this matter to the attention of reactor licensees authorized to irradiate products. If you have questions, please call me or have a member of your staff contact John Hickey (X74238).

Original Signed by  
Richard E. Cunningham

Richard E. Cunningham, Director  
Division of Fuel Cycle and  
Material Safety

cc: G. H. Cunningham, ELD  
T. T. Martin, RI  
J. P. Stohr, RII  
J. A. Hind, RIII  
R. L. Bangart, RIV  
R. A. Scarano, RV

DISTRIBUTION:

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JKinneman

\*See previous concurrence

FCML	*FCML	DD/FC	D/FC
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02	02	02	02