

MS-16  
Q4

September 4, 1987

**RCA**

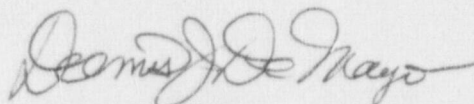
Mr. Anthony Gaines  
U.S. Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, Pa. 19406

Dear Mr. Gaines,

The Government Communications Systems Division of RCA is submitting a procedure, which we shall follow, for distribution to individuals exempt from license exempt concentrations of by-product material. Such concentrations are induced in semiconductor devices exposed to neutron irradiation to produce changes in their electrical properties. The activity of the irradiated devices, once indistinguishable from natural background, will be released to our in-house manufacturing activity in accordance with the methods prescribed by the attached procedure. The application of these devices are strictly limited to use in communications equipment manufactured for the Armed Forces of the United States and not for any commercial distribution.

Should you have any questions or require further information, please contact us.

Sincerely,



Dennis J. DeMayo  
Radiation Safety Officer  
RCA Government Communications  
Systems Division  
Front and Cooper Streets  
Camden, New Jersey 08102  
Mail Stop 10-7-1  
(609) 338-4008

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REG1 LIC30  
29-01788-02 PNU

Mail Control #L20242  
NRC License #29-01788-02

DJD:vt

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# ATTACHMENT 1

This procedure shall be followed by RCA GCSD when distributing to individuals (for in-house manufacturing of communications equipment for the Armed Forces of the United States and not for any commercial distribution) exempt from license exempt concentrations of by-product material arising from the neutron irradiation of semiconductor devices to produce changes in their electrical properties.

## 1. Radioactive Material

Exempt concentrations of the following licensed material may be present in semiconductor devices as a result of neutron irradiation.

<u>RADIONUCLIDE</u>	<u><math>\mu</math> Ci/gm</u>	<u><math>T_{1/2}</math></u>
As - 76 *	$2 \times 10^{-4}$	26.4 h
Au - 198	$5 \times 10^{-4}$	2.7 d
Br - 82 *	$3 \times 10^{-3}$	35.34 h
Co - 58	$1 \times 10^{-2}$	71.3 d
Cr - 51	$2 \times 10^{-3}$	27.8 d
Cu - 64 *	$3 \times 10^{-3}$	12.8 h
Na - 24	$2 \times 10^{-4}$	14.96 h
P - 32	$2 \times 10^{-4}$	14.28 d
Sb - 122	$3 \times 10^{-4}$	2.8 d
Sb - 124	$2 \times 10^{-3}$	60.4 d
Si - 31	$9 \times 10^{-3}$	2.62 h
Zn - 65	$1 \times 10^{-3}$	245 d

Where more than one radionuclide is present the following conditions shall be met:

$$\sum_{i=1}^n \frac{\text{Conc. } i}{\text{Exempt Conc. } i} \leq 1$$

\* Expected to be a dominating radionuclide in most devices.

RCA shall require the reactor facilitating neutron irradiation services to supply mass spectroscopy and related activation. If devices with a different composition are used, similar analyses shall be performed at the reactor facility and the radioactivity shall be limited to the radionuclides as listed in Part 33.100, Schedule A of 10 CFR 33. At that time, relative concentrations will be calculated based on device composition, neutron fluence, and cross-sectional areas.

## 2. Radiation Monitoring/Release Procedures

- a. All devices to be radiation monitored shall be initially handled with disposal rubber gloves to avoid any unnecessary skin contact before deemed as safe for release. A radiation film badge will be worn during the entire procedure.
- b. All Beta-Gamma emission shall be monitored with a pancake probe geiger counter (Ludlum 14C, calibrated with Cs 137 source on 7-6-87) on most sensitive scale. Each device shall be monitored for a period no less than 30 seconds to assure that a near stable as possible emissions reading is obtained.
- c. The maximum exposure rate expected from individual devices at the surface, 1 centimeter, or 30 centimeters is less than 0.05 mR/hr. These devices will be allowable for release as exempt concentration.
- d. Exempt concentrations of those devices which were damaged or inoperable shall be disposed in ordinary waste as long as their radioactivity cannot be distinguished from natural background levels.
- e. All survey/release and disposal records will be maintained as required.



# CONVERSATION RECORD

TIME

1:20

DATE

09/03/87

TYPE

☐ VISIT

☐ CONFERENCE

☒ TELEPHONE

☐ INCOMING

☒ OUTGOING

ROUTING

NAME/SYMBOL

INT

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

Dennis DeMayo

ORGANIZATION (Office, dept., bureau, etc.)

RCA Corp

TELEPHONE NO.

608-338-4008

SUBJECT

Renewal

29-01788-02

SUMMARY

Talked to Mr. DeMayo ~~and~~  
about exactly what he needed  
for his renewal and about him  
needing his renewal done in a hurry.  
He will be bringing the letter I need  
in on Tues 09/08/87 so we can  
expedite this.

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

Anthony D. Gaines

SIGNATURE

Anthony D. Gaines

DATE

09/03/87

ACTION TAKEN

"OFFICIAL RECORD COPY"

ML10

SIGNATURE

TITLE

DATE

50271-101

U.S. G.P.O. 1983-381-526/8346

CONVERSATION RECORD

OPTIONAL FORM 271 (12-76)  
DEPARTMENT OF DEFENSE

# CONVERSATION RECORD

TIME

1:20

DATE

09/03/87

TYPE

☐ VISIT

☐ CONFERENCE

☒ TELEPHONE

☐ INCOMING

☒ OUTGOING

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

Dennis DeMayo

ORGANIZATION (Office, dept., bureau, etc.)

RCA Corp

TELEPHONE NO.

608-338-4005

SUBJECT

Renewal

29-01788-02

SUMMARY

Talked to Mr. DeMayo about exactly what he needed for his renewal and about him needing his renewal done in a hurry. He will be bringing the letter I need in on Tues 09/08/87 so we can expedite this.

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

Anthony D. Gaines

SIGNATURE

Anthony D. Gaines

DATE

09/03/87

ACTION TAKEN

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SIGNATURE

TITLE

DATE

MLIØ

50271-101

U.S. G.P.O. 1983-381-526/8346

CONVERSATION RECORD

OPTIONAL FORM 271 (12-76)  
DEPARTMENT OF DEFENSE



# CONVERSATION RECORD

TIME

DATE

1:30 p.m.

9/01/87

TYPE

☐ VISIT

☐ CONFERENCE

☒ TELEPHONE

☐ INCOMING

☒ OUTGOING

ROUTING

NAME/SYMBOL

INT

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

Dennis DeMayo

ORGANIZATION (Office, dept., bureau, etc.)

RCA Corp.

TELEPHONE NO.

609-338-3008

SUBJECT

Renewal 29-01788-02

SUMMARY

Talked about RCA having to follow section 32.11 by M. Lamagtra's note. That he should submit the data asked for in 32.11, concentrations etc. Told him to use RCA's 29-04563-031 as a guideline. He said he would send it as soon as possible.

(see note)  
V3B, 3E

ACTION REQUIRED

None

NAME OF PERSON DOCUMENTING CONVERSATION

Anthony D. Gaines

SIGNATURE

Anthony D. Gaines

DATE

09/01/87

ACTION TAKEN

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SIGNATURE

TITLE

DATE

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DEPARTMENT OF DEFENSE

# CONVERSATION RECORD

TIME

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1:30 p.m. 9/01/87

TYPE

☐ VISIT

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☒ TELEPHONE

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ROUTING

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Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

ORGANIZATION (Office, dept., bureau, etc.)

TELEPHONE NO.

Dennis DeMayo

RCA Corp.

609-338-3008

SUBJECT

Renewal 29-01788-02

SUMMARY

Talked about RCA having to follow section 32.11 by M. Lamagtra's note. That he should submit the data asked for in 32.11, concentrations etc. Told him to use RCA's 29-04563-03 as a guideline. He said he would send it as soon as possible.

ACTION REQUIRED

None

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

Anthony D. Gaines

Anthony D. Gaines

09/01/87

ACTION TAKEN

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