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RECIP. NAME RECIPIENT AFFILIATION
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SUBJECT: Requests exemption to 10CFR20, App A, Footnote d-2(c) to allow credit for radioiodine protection factor in employing SCOTT 631-TEDA-H canister under listed limitation & precautions. Approval requested by 880331. Fee paid.

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FLORIDA POWER & LIGHT COMPANY

FEBRUARY 3 1988

L-88-57

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Re: St. Lucie Unit Nos. 1 and 2
Docket Nos. 50-335 and 50-389
10 CFR 20 Exemption Request

Pursuant to 10 CFR 20.103(e) and 10 CFR 20.501, Florida Power and Light Company hereby applies for an exemption to 10 CFR 20, Appendix A, footnote d-2(c) to allow credit for a radioiodine protection factor in employing the SCOTT 631-TEDA-H Canister.

Appendix A to 10 CFR 20 does not recognize the use of air-purifying respirators for protection against radioiodine, and footnote d-2(c) specifically prohibits this practice. However, the USNRC - Occupational Radiation Protection Branch has sponsored research to certify air-purifying respirators against radioiodine. This research has been reported in NUREG-CR 3403. Furthermore, SCOTT has provided test results (attached) for the SCOTT 631-TEDA-H Canister. These tests were performed consistent with the qualification process recommended in NUREG-CR 3403.

Although respiratory protection for radioiodine is normally provided by use of air supplied or self-contained breathing apparatus, the use of these appliances is cumbersome and contribute to worker fatique and lost efficiency. The net result is increased man-rem exposure and a reduction in personnel safety margin. The use of air-purifying respirators can enhance worker comfort and allow greater mobility than the other appliances. We estimate that air-purifying respirators would enable a 25-50% reduction in the time required to conduct tasks requiring respiratory protection. This correlates to a 25-50% reduction in man-rem exposure for these tasks.



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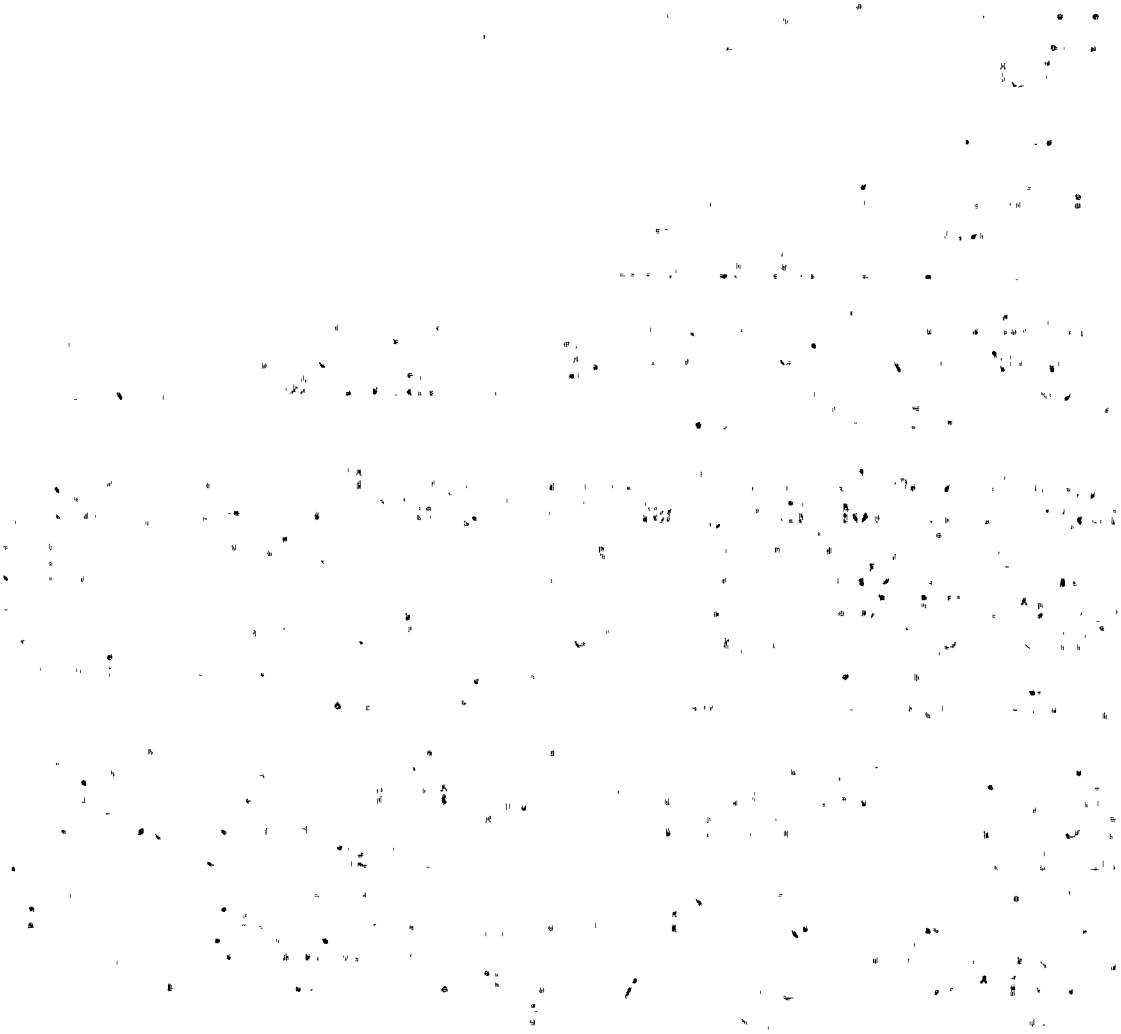

Use of the SCOTT Canisters would be under the following limitations and precautions:

1. Protection Factor = 50
2. 8 hour maximum service life (time from unsealing to discarding, including periods of non-exposure).
3. Not to be used in the presence of organic solvent vapors.
4. To be stored in sealed, humidity barrier packaging.
5. To be used only with a full facepiece respirator for which the canister has been NIOSH/MSHA certified.
6. Not to be used in environments greater than 120°F.
7. Not to be used in challenge concentrations of total organic iodide, including nonradiometric iodide, greater than 1 ppm.

We request your approval of this exemption request by March 31, 1988, so that the necessary equipment can be purchased in time for the upcoming St. Lucie Unit 1 refueling outage, which is currently scheduled for July 3, 1988.

Also attached is FPL Check No. 7152 for the required $150.00 application fee.

Very truly yours,

for C. O. Woody
Executive Vice President

COW/MSD/gp

Attachments

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

ATTACHMENT 1
SCOTT 631-TEDA-H CANISTER
TEST SUMMARY

The tests were conducted consistent with the qualification process recommended in NUREG-CR 3403, "Criteria and Test Methods for Certifying Air-Purifying Respirator Cartridges Against Radioiodine" (Table A).

TABLE A
TESTING CONDITIONS AND ACCEPTANCE CRITERIA

| TEST PARAMETER | NUREG/CR-3403 RADIOIODINE PROPOSAL | SCOTT RADIOIODINE PROPOSAL |
|---|---|---|
| Vapor | $CH_3I$ | $CH_3I$ |
| Concentration | 1 ppm | 2.5-10 ppm |
| Relative Humidity | 50; 75% (+2%) | 60; 90% (+2%) |
| Temperature | 30 + 1 C | 100; 120°F |
| Total Airflow | | |
| As Received | 64 L/min Cyclic Flow | 64 L/min Pulsed Flow |
| Equilibrated | | |
| Equilibration | All As Received | ** |
| (6 H at 64 L/min) | 3 - At 50% RH | |
| | 3 - At 75% RH | |
| Maximum Penetration | 1% (0.01 ppm) | 1% |
| Minimum Service Life | 30 min at 100% RH* | 8 hr** |
| | 60 min at 75% RH | |

* Extrapolated from 50% and 75% RH
** Mil-Std-414 (See Attachment 3)

The tests were also conducted under environmental conditions (temperature and relative humidity) that are considered the most restrictive conditions in which the canisters would be used at the St. Lucie Plant. The data from the testing of the SCOTT 631-TEDA-H Canister supports approval of the canister for its intended use (Table B).

TABLE B
DATA SUMMARY

| # TESTED | TEMP (°F) | % RH | MEAN | STD. DEV. | RANGE (hrs) |
|---|---|---|---|---|---|
| 37 | 120 | 90% | 13.8 hrs | 2.4 | 8.4-17.8 |
| 37 | 120 | 60% | 23.9 hrs | 2.7 | 20.5-30.8 |
| 28 | 100 | 90% | 15.3 hrs | 2.5 | 10.1-21.3 |
| 14 | 100 | 60% | 23.1 hrs | 1.9 | 19.5-25.3 |

ATTACHMENT 2
METHYL IODIDE ($CH_3I$) PERFORMANCE DATA FOR THE
SCOTT 631-TEDA-H CHIN CANISTER

TABLE 1

METHYL IODIDE ($CH_3I$) PERFORMANCE DATA FOR THE SCOTT 631-TEDA-H CHIN CANISTER

TEST CONDITIONS:

| | |
|---|---|
| $CH_3I$ CHALLENGE CONCENTRATION: | 10 ppm |
| BREAKTHROUGH CONCENTRATION: | 0.1 ppm (100 ppb) |
| AIR TEMPERATURE/RELATIVE HUMIDITY: | 48.9°C (120°F)/90 ± 2% R.H. |
| AIRFLOW CONDITIONS: | Pulsed Flow<br>192 lpm for 0.82 sec<br>0 lpm for 1.64 sec<br>Minute Volume 64 lpm |

| RUN NO. | TIME TO BREAKTHROUGH (hrs.) | | | CANISTER % WEIGHT CHANGE | | |
|---|---|---|---|---|---|---|
| | #1 | #2 | #3 | #1 | #2 | #3 |
| 1 | 15.5 | 15.5 | 17.8 | 10.3 | 11.3 | 10.8 |
| 2 | 13.7 | 11.2 | 15.4 | 11.5 | 11.2 | 9.8 |
| 3 | 8.4 | 13.7 | 11.6 | 11.7 | 10.7 | 10.1 |
| 4 | 9.3 | 12.0 | 11.0 | 11.4 | 10.3 | 10.0 |
| 5 | 13.8 | 13.8 | 13.8 | 10.5 | 9.6 | 11.2 |
| 6 | 11.7 | 12.5 | 10.8 | 11.7 | 11.3 | 12.0 |
| 7 | - | 13.2 | 12.3 | - | 11.3 | 11.4 |
| 8 | 11.9 | 10.5 | 14.8 | 11.3 | 11.7 | 11.3 |
| 9 | 11.3 | - | 17.5 | 11.3 | - | 11.1 |
| 10 | - | 15.8 | - | - | 10.8 | - |
| 11 | 13.5 | 16.5 | 15.8 | 11.1 | 11.5 | 11.1 |
| 12 | 16.0 | 15.5 | 14.5 | 11.1 | 11.4 | 11.4 |
| 13 | 16.3 | 15.7 | 17.5 | 11.2 | 11.1 | 11.1 |
| 14 | 13.0 | - | 16.2 | 11.4 | - | 11.1 |

Mean breakthrough time = 13.8 hrs.

n = 37

Std. dev. = 2.4 hrs.

[-] Excluded data; prototype canister and/or different test conditions

## TABLE 2

METHYL IODIDE ($CH_3I$) PERFORMANCE DATA FOR THE SCOTT 631-TEDA-H CHIN CANISTER

TEST CONDITIONS:

| | |
|---|---|
| $CH_3I$ CHALLENGE CONCENTRATION: | 10 ppm |
| BREAKTHROUGH CONCENTRATION: | 0.1 ppm (100 ppb) |
| AIR TEMPERATURE/RELATIVE HUMIDITY: | 48.9°C (120°F)/60 ± 2% R.H. |
| AIRFLOW CONDITIONS: | Pulsed Flow<br>192 lpm for 0.82 sec<br>0 lpm for 1.64 sec<br>Minute Volume 64 lpm |

| RUN NO. | TIME TO BREAKTHROUGH (hrs.) | | | CANISTER % WEIGHT CHANGE | | |
|---|---|---|---|---|---|---|
| | #1 | #2 | #3 | #1 | #2 | #3 |
| 1 | 29.0 | 30.8 | 21.5 | 2.1 | 2.0 | 1.5 |
| 2 | 27.2 | 29.3 | 28.2 | 2.3 | 2.1 | 2.1 |
| 3 | 27.6 | 26.6 | 21.2 | 4.9 | 4.7 | 4.6 |
| 4 | 24.3 | 22.0 | 23.4 | 4.9 | 4.9 | 5.1 |
| 5 | 25.3 | 24.4 | 22.0 | 5.9 | 5.7 | 5.0 |
| 6 | 20.6 | 22.0 | 21.4 | 4.8 | 4.6 | 4.8 |
| 7 | 23.9 | 25.0 | 22.9 | 3.1 | 3.5 | 3.0 |
| 8 | 23.4 | 22.5 | 22.0 | 3.6 | 3.9 | 3.5 |
| 9 | 22.4 | 21.5 | 22.0 | 4.3 | 4.6 | 4.1 |
| 10 | 23.6 | 20.5 | 21.0 | 3.9 | 4.0 | 3.8 |
| 11 | 23.2 | 24.9 | 25.8 | 5.8 | 5.9 | 5.5 |
| 12 | - | 23.5 | 21.2 | - | 3.7 | 5.6 |
| 13 | - | 27.2 | 22.4 | - | 3.5 | 5.4 |

Mean breakthrough time = 23.9 hrs.

n = 37

Std. dev. = 2.7 hrs.

[-] Excluded data; prototype canister and/or different test conditions

## TABLE 3

METHYL IODIDE ($CH_3I$) PERFORMANCE DATA FOR THE SCOTT 631-TEDA-H CHIN CANISTER

TEST CONDITIONS:

| | |
|---|---|
| $CH_3I$ CHALLENGE CONCENTRATION: | 10 ppm |
| BREAKTHROUGH CONCENTRATION: | 0.1 ppm (100 ppb) |
| AIR TEMPERATURE/RELATIVE HUMIDITY: | 37.8°C (100°F)/90 ± 2% R.H. |
| AIRFLOW CONDITIONS: | Pulsed Flow<br>192 lpm for 0.82 sec<br>0 lpm for 1.64 sec<br>Minute Volume 64 lpm |

| RUN NO. | TIME TO BREAKTHROUGH (hrs.) | | | CANISTER % WEIGHT CHANGE | | |
|---|---|---|---|---|---|---|
| | #1 | #2 | #3 | #1 | #2 | #3 |
| 1 | 16.4 | 14.8 | 13.3 | 9.7 | 10.0 | 10.0 |
| 2 | 16.0 | 15.2 | 13.2 | 9.9 | 9.8 | 10.2 |
| 3 | 17.7 | 15.0 | 12.1 | 10.6 | 10.3 | 10.8 |
| 4 | 16.5 | 21.3 | 16.5 | 10.8 | 10.9 | 9.8 |
| 5 | - | 15.2 | 12.9 | - | 11.9 | 11.2 |
| 6 | 13.4 | - | 15.0 | 11.9 | - | 11.8 |
| 7 | 11.9 | 15.5 | 13.1 | 11.1 | 11.5 | 11.3 |
| 8 | 16.0 | 18.2 | 19.7 | 10.8 | 11.3 | 10.6 |
| 9 | 17.5 | 12.5 | 18.9 | 10.5 | 10.8 | 10.6 |
| 10 | 10.1 | 15.2 | 16.3 | 11.7 | 11.1 | 11.1 |

Mean breakthrough time = 15.3 hrs.

n = 28

Std. dev. = 2.5 hrs.

[-] Excluded data; prototype canister and/or different test conditions

TABLE 4

METHYL IODIDE ($CH_3I$) PERFORMANCE DATA FOR THE SCOTT 631-TEDA-H CHIN CANISTER

TEST CONDITIONS:

| | |
|---|---|
| $CH_3I$ CHALLENGE CONCENTRATION: | 10 ppm |
| BREAKTHROUGH CONCENTRATION: | 0.1 ppm (100 ppb) |
| AIR TEMPERATURE/RELATIVE HUMIDITY: | 37.8°C (100°F)/60 ± 2% R.H. |
| AIRFLOW CONDITIONS: | Pulsed Flow<br>192 lpm for 0.82 sec<br>0 lpm for 1.64 sec<br>Minute Volume 64 lpm |

| RUN NO. | TIME TO BREAKTHROUGH (hrs.) | | | CANISTER % WEIGHT CHANGE | | |
|---|---|---|---|---|---|---|
| | #1 | #2 | #3 | #1 | #2 | #3 |
| 1 | 23.0 | 20.5 | 20.1 | 3.7 | 4.0 | 3.7 |
| 2 | 24.4 | 24.1 | 25.1 | 3.7 | 3.9 | 3.7 |
| 3 | 23.4 | - | 23.4 | 6.6 | - | 6.4 |
| 4 | 23.7 | 21.4 | 25.3 | 6.4 | 4.7 | 6.1 |
| 5 | 24.2 | 19.5 | 24.6 | 6.5 | 5.0 | 5.0 |

Mean breakthrough time = 23.1 hrs.

n = 14

Std. dev. = 1.9 hrs.

[-] Excluded data; prototype canister and/or different test conditions

TABLE 5

METHYL IODIDE ($CH_3I$) PERFORMANCE DATA FOR THE SCOTT 631-TEDA-H CHIN CANISTER

TEST CONDITIONS:

AIRFLOW CONDITIONS: Pulsed Flow
192 lpm for 0.82 sec
0 lpm for 1.64 sec
Minute Volume 64 lpm

CHALLENGE CONCENTRATION: See Below

AIR TEMPERATURE/RELATIVE HUMIDITY: 48.9°C (120°F)/90 ± 2% R.H.

| RUN NO. | CHALLENGE CONC. (ppm) | BREAKTHROUGH CONC. (ppb) | TIME TO BREAKTHROUGH (hrs.) | | | CANISTER % WEIGHT CHANGE | | |
|---|---|---|---|---|---|---|---|---|
| | | | #1 | #2 | #3 | #1 | #2 | #3 |
| 1 | 2.5 | 25 | >26.0 | >26.0 | >26.0 | - | - | - |
| 2 | 2.5 | 25 | 44.0 | 49.0 | 43.5 | 14.7 | 10.0 | 10.8 |
| 3 | 5.0 | 50 | >24.0 | >24.0 | >24.0 | 9.3 | 9.6 | 10.3 |
| 4 | 5.0 | 50 | >24.0 | >24.0 | >24.0 | 10.1 | 11.0 | 10.9 |
| 5 | 5.0 | 50 | >24.0 | 26.4 | >24.0 | 9.0 | 9.8 | 10.2 |
| 6 | 5.0 | 50 | >24.0 | >24.0 | >24.0 | 8.1 | 7.8 | 7.8 |
| 7 | 5.0 | 50 | 23.0 | 24.1 | 23.6 | 12.0 | 11.2 | 11.0 |
| 8 | 5.0 | 50 | >24.0 | - | >24.0 | 11.3 | - | 11.0 |
| 9 | 5.0 | 50 | >24.0 | >24.0 | >24.0 | 11.2 | 11.4 | 11.1 |
| 10 | 5.0 | 50 | >24.0 | - | >24.0 | 10.4 | - | 11.3 |

[-] Excluded data; prototype canister and/or different test conditions

## TABLE 6

METHYL IODIDE ($CH_3I$) PERFORMANCE DATA FOR THE SCOTT 631-TEDA-H CHIN CANISTER[1]

TEST CONDITIONS:

AIRFLOW CONDITIONS: Continuous Flow
64 lpm/canister
CHALLENGE CONCENTRATION: 10 ppm
BREAKTHROUGH CONCENTRATION: 0.1 ppm
AIRFLOW TEMPERATURE: See Below
AIRFLOW RELATIVE HUMIDITY: 90 ± 2% R.H.

| RUN NO. | AIR TEMP. (°C) | TIME TO BREAKTHROUGH (hrs.) #1 | #2 | #3 | CANISTER % WEIGHT CHANGE #1 | #2 | #3 |
|---|---|---|---|---|---|---|---|
| 1 | 48.9 | See below Note 2 | | 21.8 | See below Note 2 | | 11.9 |
| 2 | 48.9 | | | 20.7 | | | 11.8 |
| 3 | 48.9 | | | 24.5 | | | 11.5 |
| 4 | 48.9 | | | 25.2 | | | 11.3 |
| 5 | 48.9 | 18.0 | (28.0) | (31.5) | 11.8 | 11.4 | 11.4 |
| 6 | 48.9 | (31.5) | 17.0 | (27.5) | 11.1 | 11.7 | 10.0 |
| 7 | 48.9 | (26.0) | (28.0) | (28.0) | 10.8 | 10.9 | 11.1 |
| 8 | 48.9 | (32.0) | (21.5) | (28.0) | 9.7 | 14.3 | 13.1 |
| 9 | 37.8 | 24.0 | 18.3 | 16.0 | 11.6 | 11.5 | 12.1 |

NOTES:

1. Bracketed numbers signify breakthrough was not achieved at 24 hours (i.e. test termination), however, estimated breakthrough time was extrapolated from breakthrough curve characteristics.
2. Run 1 thru 4, the test device was operated at 64 lpm through 1 canister; Run 5 thru 9, the test device was operated at 192 lpm to 3 canisters in parrallel

ATTACHMENT #3

QUALITY CONTROL LOT ACCEPTANCE PLAN
FOR INSPECTION OF THE SCOTT 631-TEDA-H CANISTER

The inspection plan conforms to MIL-STD. 414, variability unknown, standard deviation method. The sample size selection is per Level II, normal inspection with AQL = 1%. The plan is for a single specification limit case, Form 1.

The upper specification limit was selected as 1% of the challenge concentration which is identical to the performance requirement for the canister. Test conditions are for a 5 ppm $CH_3I$ challenge concentration in air at 120°F and 90% R.H. Flow through the canister is pulsed, with 192 lpm of air flowing for 0.82 seconds followed by 0 lpm flow for 1.64 seconds. This produces an effective minute volume of 64 liters.

Canister testing would be terminated after 8 hours and the $CH_3I$ penetration compared to the upper specification limit. Using MIL-STD. 414, acceptance of the lot under evaluation would be determined.

The sample size selected for a given production lot size would be as follows:

| LOT SIZE | SAMPLE SIZE |
|---|---|
| 501 - 800 | 10 |
| 801 - 1300 | 15 |
| 1301 - 3200 | 20 |
| 3201 - 8000 | 25 |

MSD005.CFR