

October 27, 1988

Docket No. 50-424

Mr. W. G. Hairston, III
Senior Vice President -
Nuclear Operations
Georgia Power Company
P. O. Box 4545
Atlanta, Georgia 30302

Dear Mr. Hairston:

SUBJECT: EXEMPTION AND AUTHORIZATION FOR USE OF SOLVENT IODINE CANISTERS
UNIT 1 (TAC 69248)

The Nuclear Regulatory Commission has granted the enclosed Exemption and authorized the use of a radioiodine protection factor of 50 for certain respiratory protection canisters used by workers at the Vogtle Electric Generating Plant, Unit 1. The exemption and authorization was granted in response to your letter dated August 26, 1988 as supplemented October 6, 1988.

We find that granting the Exemption is authorized by law and will not result in undue hazard to life or property.

Also enclosed is a safety evaluation report supporting granting of the Exemption and authorizing the use of equipment which has not been certified by NIOSH/MSHA.

The Exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Jon B. Hopkins, Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II

Enclosures:

- 1. Exemption
- 2. Safety Evaluation

cc w/enclosures: See next page

PDII-3
MRood
10/17/88

PDII-3
Hopkins:sw
10/17/88

PRPE:WRR
LCunningham
10/18/88

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Matthews
10/24/88

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Mr. W. G. Hairston, III
Georgia Power Company

Vogle Electric Generating Plant

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Atlanta, Georgia 30334

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)

GEORGIA POWER COMPANY)
OGLETHORPE POWER CORPORATION)
MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA)
CITY OF DALTON, GEORGIA)
VOGTLE ELECTRIC GENERATING PLANT, UNIT 1)

Docket No. 50-424

EXEMPTION

I.

Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia (the licensee), are the holders of Facility Operating License No. NPF-68 issued March 16, 1987, which authorizes full power operation of the Vogtle Electric Generating Plant, Unit 1 (the facility). The license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission.

The facility consists of a pressurized water reactor at the licensee's site location in Burke County, Georgia.

II.

10 CFR Part 20, Appendix A, "Protection Factors for Respirators," establishes protection factors of air-purifying respirators for protection against particulates only. Furthermore, footnote d-2(c) states, "No allowance is to be made for the use of sorbents against radioactive gases or vapors." This

restriction was needed since an inadequate data base had existed for evaluating the complex interaction of many factors affecting the service life and removal efficiency of radioactive gases and vapors by sorbent canisters. Also, due to the lack of a data base, a NIOSH/MSHA certification schedule to ensure that canisters meet acceptable performance criteria has not been established.

10 CFR Part 20.103(e) allows authorization by the Commission in lieu of a NIOSH/MSHA certification schedule based on adequate testing, material and performance characteristics. An application by a licensee for this authorization must include a demonstration by testing, or on the basis of reliable test information, that the material and performance characteristics of the equipment are capable of providing the proposed degree of protection under anticipated conditions of use. The licensee made such an application.

10 CFR Part 20.501 allows an exemption to be granted by the Commission from the requirements of the regulations in 10 CFR Part 20 as it determines are authorized by law and will not result in undue hazard to life or property.

By letter dated August 26, 1988, as supplemented October 6, 1988, the licensee requested an exemption based on 10 CFR 20.501 to allow the use of radioiodine MSA GMR-I canisters with a protection factor of 50 for personnel respiratory protection during scheduled refueling outage work. The licensee cited research data, test results, test protocol and quality assurance sampling plan that it stated satisfies the recommended qualification process of NUREG/CR-3403, "Criteria and Test Methods for Certifying Air-Purifying Respirator Cartridges and Canisters Against Radioiodine." The NRC staff

evaluated the information provided by the licensee to support the exemption request. The NRC staff's safety evaluation on this matter relating to the use of a radioiodine protection factor for GMR-I canisters at Vogtle 1 has been issued. The safety evaluation concludes that the licensee's proposed use of radioiodine MSA GMR-I canisters with certain usage restrictions and controls can result in significant dose savings over alternative methods while still providing effective protection.

III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 20.501, an exemption as requested by the licensee's letter of August 26, 1988, as supplemented October 6, 1988, is authorized by law and will not result in undue hazard to life or property. The Commission hereby grants an exemption from the restriction of 10 CFR Part 20, Appendix A, footnote d-2(c), and authorizes the use of the MSA GMR-I canister, with restrictions as shown in Attachment 1 to this exemption. The exemption is subject to modification by rule, regulation or Order of the Commission.

Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of the exemption will have no significant impact on the environment (53FR 36925).

This exemption is effective upon issuance.

Dated at Rockville, Maryland this 27th day of October 1988 .

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed By:

Steven A. Varga, Director
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Attachment:
Usage Restrictions

PDII-3
MRood
10/17/88

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JHopkins:sw
10/17/88

OGC
OPW
10/19/88

PDII-3
DMatthews
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Attachment 1

Limitations, Usage Restrictions, and Controls Applicable to the Use of MSA GMR-I Canister at the Vogtle Electric Generating Plant, Unit 1

1. Protection factor equal to 50 as a maximum value.
2. The maximum permissible continuous use time is eight hours after which the canister will be discarded.
3. Canisters are not to be used in the presence of organic solvent vapors.
4. Canisters are to be stored in a Class A or better environment, as defined in ANSI N45.2.2.
5. The allowable service life for sorbent canisters is to be calculated from the time of unsealing the canister, including periods of non-exposure.
6. Canister is to be used with a full facepiece capable of providing a protection factor equal to or greater than 500.
7. Canisters are not to be used in total challenge concentrations of organic iodines and other halogenated compounds greater than 1ppm, including nonradioactive compounds.
8. Canisters are not to be used in environments where temperatures are greater than 110°F, or up to 120°F if the dewpoint is equal to or less than 107°F.

In addition to the limitations and usage restrictions noted above, the following additional controls will be utilized by the licensee:

1. Temperatures will be measured prior to and/or during the use of GMR-I canisters to assure that work temperatures are within limits.
2. Air samples will be taken prior to and during any activities that involve the use of the GMR-I canister for protection against radioactive iodine.
3. A GMR-I canister found to have exceeded 3 years from date of manufacture will not be used for protection against radioactive iodine.
4. In the initial implementation of the GMR-I program, the following verification measures will be in effect:
 - a. Weekly whole body counts for individuals using the GMR-I canisters for radioiodine protection;
 - b. A whole body count for individuals that exceed 10 MPC in a week and used the GMR-I canister for respiratory protection in that period;
 - c. Anyone that measures 70 nCI or greater iodine uptake to the thyroid during a whole body count will be restricted from entering a radioiodine atmosphere pending Health Physics evaluation;
 - d. The radiological survey and whole body count information will be compiled to evaluate the effectiveness of the program.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO THE USE OF A
RADIOIODINE PROTECTION FACTOR FOR SORBENT CANISTERS
AT VOGTLE ELECTRIC GENERATING PLANT, UNIT 1
DOCKET NO. 50-424

INTRODUCTION

By submittal dated August 26, 1988 as supplemented October 6, 1988, Georgia Power Company, et al., (the licensee) requested an exemption to 10 CFR Part 20, Appendix A, footnote d-2(c), and for authorization to use equipment which has not been certified by NIOSH/MSHA. The licensee submitted this request in accordance with 10 CFR Parts 20.501 and 20.103(e).

Test data and canister qualification information have been provided by the licensee. The exemption and authorization would allow the use of a radioiodine protection factor of 50 for MSA GMR-I canisters at Vogtle Electric Generating Plant, Unit 1 (Vogtle 1). Criteria and background information used for our evaluation include 10 CFR Part 20.103; 10 CFR Part 19.12; Regulatory Guide 8.15 "Acceptable Programs for Respiratory Protection;" Regulatory Guide 8.20, "Applications of Bioassay for I-125, and I-131;" NUREG/CR-3403, "Cartridges and Test Methods for Certifying Air Purifying Respirator Cartridges and Canisters Against Radioiodine," and Regulatory Guide 8.8, "Information Relevant to Ensuring That Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable."

DISCUSSION AND EVALUATION

Since a NIOSH/MSHA testing and certification schedule for sorbents for use for protection against radioiodine gases and vapors has not been developed, the NRC staff has evaluated the licensee's request and verified that the licensee has demonstrated through reliable test data and adequate quality assurance measures that the material and performance characteristics of the MSA GMR-I canister can provide the proposed degree of protection (i.e., a protection factor of 50) under the anticipated conditions of use, as required by 10 CFR Part 20.103(e), for 8 hours. We considered canister efficiency and service life, and the effects of temperature, poisons, relative humidity, challenge concentration and breathing rates on canister efficiency and service life. The programmatic evaluation considered quality control/quality assurance, and radiation protection/ALARA considerations, including task preparation and planning, on-the-job and post-task evaluations, use of engineering controls, radiological surveillance, and radiological training.

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The licensee has provided reliable test information which verifies that the MSA GMR-I canister will provide a protection factor of 50 over a period of 8 hours of continuous use, provided that the total challenge of radioactive and non-radioactive iodine and other halogenated compounds does not exceed 1 ppm, and temperature does not exceed 110°F, or up to 120°F provided the dewpoint does not exceed 107°F. The data provided by MSA showed the breakthrough point to be well beyond 8 hours.

Testing has been conducted under acceptable conditions of cyclic flow, and under worst case conditions for those environmental factors affecting service life: temperature, relative humidity, and challenge concentration of CH₃I (methyl iodide/methyl radiiodide), which is the most penetrating of the challenge forms. Data provided from MSA indicate that the MSA GMR-I canisters perform adequately under the acceptable test conditions. These conditions - the criteria and test methods - are consistent with those derived for the canisters by the NRC staff from NUREG/CR-3403, and are acceptable.

The licensee, through acceptance of MSA QA controls, has provided commitments that the MSA GMR-I canisters will meet standards for quality assurance and quality control which are recognized by NIOSH, compatible with NRC staff positions, and are therefore acceptable. This includes a commitment by MSA to establish a 1% AQL (Acceptable Quality Limit) in a 5 to 10 ppm challenge concentration of CH₃I, 90% relative humidity, 110°F, 64 LPM cyclic flow, for a service life of 8³ hours or more at penetration equal to 1% of the challenge concentration. Testing data referenced by the licensee demonstrated that performance (i.e., service life) of canisters at 100% relative humidity is acceptable.

Coupled with the use of a full facepiece with the capability of providing a protection factor equal to or greater than 500 by quantitative fit test, the protection factor of 50 is acceptable. Canister efficiency will be retained for the radioiodine gas or vapors of interest (CH₃I, I₂, HOI) for this time period. To preclude aging, service life will be calculated² from unsealing time, including periods of non-use, and the canister will not be used in the presence of organic solvents or in temperatures in excess of 107°F dewpoint. Canisters will be stored in sealed humidity-barrier packaging in a cool, dry environment, and discarded after the 8-hour use period to prevent reuse. Through usage restrictions and air sampling, the licensee will preclude exposures to organic vapors and chemicals (such as decontamination compounds, lubricants, volatized paint, alcohols, freon) which could cause aging, poisoning or desorption of the absorbed radioiodines.

Certain limitations and precautions based on NUREG/CR-3403 guidance are necessary for utilization of the sorbent canisters. We agree with the following limitations and usage restrictions as proposed by the licensee:

1. Protection factor equal to 50 as a maximum value.
2. The maximum permissible continuous use time is eight hours after which the canister will be discarded.

3. Canisters are not to be used in the presence of organic solvent vapors.
4. Canisters are to be stored in a Class A or better environment as defined in ANSI N45.2.2.
5. The allowable service life for sorbent canisters is to be calculated from the time of unsealing the canister, including periods of non-exposure.
6. Canister is to be used with a full facepiece capable of providing a protection factor equal to or greater than 500.
7. Canisters are not to be used in total challenge concentrations of organic iodines and other halogenated compounds greater than 1 ppm, including nonradioactive compounds.
8. Canisters are not to be used in environments where temperatures are greater than 110° or up to 120°F, if the dewpoint is equal to or less than 107°F.

In addition to the limitations and usage restrictions noted above, the following additional controls will be utilized by the licensee:

1. Temperatures will be measured prior to and/or during the use of GMR-I canisters to assure that work temperatures are within limits.
2. Air samples will be taken prior to and during any activities that involve the use of the GMR-I canister for protection against radioactive iodine.
3. A GMR-I canister found to have exceeded 3 years from date of manufacture will not be used for protection against radioactive iodine.
4. In the initial implementation of the GMR-I program, the following verification measures will be in effect:
 - a. Weekly whole body counts for individuals using the GMR-I canisters for radioiodine protection.
 - b. A whole body count for individuals that exceed 10 MPC in a week and used the GMR-I canister for respiratory protection in that period.
 - c. Anyone that measures 70 nCi or greater iodine uptake to the thyroid during a whole body count will be restricted from entering a radioiodine atmosphere pending Health Physics evaluation.
 - d. The radiological survey and whole body count information will be compiled to evaluate the effectiveness of the program.

5. Vogtle Technical Specification 4.7.7, "Piping Penetration Area Filtration and Exhaust System," defines the availability and surveillance requirements related to the auxiliary building radiation area filter exhaust and continuous exhaust system. The containment purification and clean-up system and the aux. building radiation area filter exhaust and continuous exhaust system plant procedures, governing the operability and functioning of charcoal beds, are in compliance with Regulatory Guides 1.140 and 1.52 for design, testing, and maintenance of filtration systems. These requirements are utilized to demonstrate system operability with respect to HEPA and charcoal filters. Since GMR-I canisters will be in the same areas served by these systems, assurance of continuing operability of these systems will provide assurance of a proper environment (i.e., no organic vapors or chemicals) for GMR-I canister use.
6. Specific plant procedures will incorporate the limitations and usage restrictions, listed as 1 through 8 above, prior to GMR-I canister use. Additionally, training of workers on the proper use and the limitations of the GMR-I canisters will be performed prior to canister issuance.
7. Existing licensee engineering controls to relieve the needs for respiratory protection as required in 10 CFR 20.103(b)(1) will still apply. These measures include but are not limited to, degasification of the reactor coolant system, crud burst clean up, process to confine or eliminate airborne radioactivity, delay breaches of primary systems to allow decay of radioisotopes and area decontamination to decrease possibilities of generating airborne radioactive material.

The primary bases for the licensee's request for exemption are the potentials for both increased worker safety and dose reduction. The utilization of air purifying respirators in lieu of air-supplied or self-contained apparatuses, where possible, can result in person-rem reductions estimated overall at 30% for tasks requiring radioiodine protection, in a range of from 25% to 50% for several major tasks. The light weight, less cumbersome air purifying respirators (i.e., sorbent canisters) can provide increased comfort and mobility in most cases, and result in increased worker efficiency and decreased time on-the-job.

Other actions taken by the licensee to assure that exposures to radioiodine are as low as is reasonably achievable (ALARA) are: radioiodine air sampling before and during activities involving the use of sorbent canisters for radioiodine protection; engineering controls such as degasification of the primary coolant; area decontamination to control contamination levels; maintenance planning allowing for radioiodine decay times, where practical, prior to breaching primary systems. Whole body counts will be conducted routinely, radiological data will be evaluated, an evaluation level for radioiodine uptakes has been established (at 70 nCi); training of workers and health physics technicians in the use and restrictions for the use of sorbent canisters for radioiodine protection will be conducted prior to their use; and procedures iterating the controls, restrictions, and requirements will be developed and implemented. The licensee's efforts to keep exposure ALARA are consistent with staff positions in Regulatory Guide 8.8 and are acceptable.

SAFETY SUMMARY

The NRC staff review of the licensee's proposal indicates that the actions proposed by the licensee can result in significant dose savings over alternative methods while still providing effective protection. This exemption would enable the licensee to use a protection factor for air purifying radioiodine gas and vapor respirators in estimating worker exposures from radioiodine gases and vapors. The licensee has provided usage restrictions and controls which can assure an effective radioiodine protection program. The proposed criteria and test methods for verifying the effectiveness and quality of GMR-I canisters are consistent with our criteria. The licensee's proposed exemption, with the controls and limitations, meets the NRC staff's positions in the Standard Review Plan (NUREG-0800), NUREG/CR-3403 and Regulatory Guide 8.8, and is acceptable. The actions proposed by the licensee are consistent with the requirements of 10 CFR Part 20.103(e), and form an acceptable basis to authorize the use of equipment (MSA GMR-I canisters) in accordance with 10 CFR 20.103(e) and to authorize the granting of an exemption in accordance with the provisions of 10 CFR Part 20.501.

Principal Contributor: Jon B. Hopkins, PDII-3/NRR

Dated: October 27, 1988

DISTRIBUTION

Docket File

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Local PDR

PDII-3 Reading

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C. Hinson 11-D-23

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VOGTLE PLANT FILE

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