

19,
November 1, 1987

Docket No. 50-476

Mr. Oliver D. Kingsley, Jr.
Vice President, Nuclear Operations
System Energy Resources, Inc.
P.O. Box 23054
Jackson, Mississippi 39205

DISTRIBUTION	C. Hinson
<u>Docket File</u>	L. Kintner
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C. Rossi	ACRS (10)
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Dear Mr. Kingsley:

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 - EXEMPTION TO 10 CFR PART 20 FOR USE OF A PROTECTION FACTOR WITH MSA GMR-1 CANISTERS (TAC NO. 65657)

In response to your letter dated June 29, 1987, as supplemented August 21, 1987, the Commission has issued the enclosed exemption from the requirements of 10 CFR Part 20, Appendix A, footnote d-2(c). The exemption allows the use of a radioiodine protection factor of 50 for Mine Safety Appliances (MSA) GMR-1 canisters at the Grand Gulf Nuclear Station, Unit 1.

We have concluded, based on the considerations discussed in the exemption, that the exemption is authorized by law and will not result in undue hazard to life or property. The programmatic and usage restrictions for the GMR-1 canisters, identified in the exemption, should be implemented prior to the use of the canisters or 60 days after issuance of this exemption, whichever occurs first.

The exemption is being forwarded to the Office of the Federal Register for publication. The related Notice of Environmental Assessment and Finding of No Significant Impact was published in the Federal Register on November 18, 1987.

Sincerely,

Original signed by

Lester L. Kintner, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects-I/II

Enclosure:
As stated

cc w/enclosure:
See next page

*See previous concurrence
 *LA:PDII-2 *PM:PDII-2
 DMiller LKintner:bg
 10/06/87 10/06/87

*D:PDII-2
 HBerkow
 10/07/87

*OGC
 MYoung
 10/13/87

J. Sniezek
 PDIA
 GLainas
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November 19 1987

Docket No. 50-416

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Vice President, Nuclear Operations
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Project Directorate II-2
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DMiller LKintner:bg
10/06/87 10/06/87

*D:PDII-2
HBerkow
10/07/87

*OGC
MYoung
10/13/87

<i>[Signature]</i>	DRPR
GLainas	Syarga
11/16/87	11/16/87



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

November 19, 1987

Docket No. 50-416

Mr. Oliver D. Kingsley, Jr.
Vice President, Nuclear Operations
System Energy Resources, Inc.
P.O. Box 23054
Jackson, Mississippi 39205

Dear Mr. Kingsley:

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 - EXEMPTION TO 10 CFR PART 20 FOR
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Sincerely,

A handwritten signature in cursive script that reads "L L Kintner".

Lester L. Kintner, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects-I/II

Enclosure:
As stated

cc w/enclosure:
See next page

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Port Gibson, Mississippi 39150

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
MISSISSIPPI POWER & LIGHT COMPANY,)
SYSTEM ENERGY RESOURCES, INC., AND) Docket No. 50-416
SOUTH MISSISSIPPI ELECTRIC POWER)
ASSOCIATION)
)
(Grand Gulf Nuclear Station, Unit 1))

EXEMPTION

I

Mississippi Power & Light Company, System Energy Resources, Inc., and South Mississippi Electric Power Association (the licensees) are the holders of Facility Operating License No. NPF-29, issued November 1, 1984, which authorizes operation of the Grand Gulf Nuclear Station, Unit 1 (the facility). This license provides, among other things, that the licensees are subject to all rules, regulations and orders of the Nuclear Regulatory Commission (the Commission). The facility is a boiling water reactor located in Claiborne County, Mississippi.

II.

Appendix A of 10 CFR Part 20 defines protection factors for respirators. Footnote d-2(c) of this appendix states, "No allowance is to be made for the use of sorbents against radioactive gases or vapors."

By letter dated June 29, 1987, System Energy Resources Inc. (SERI, or the licensee) requested an exemption to 10 CFR Part 20, Appendix A, footnote d-2(c) in accordance with 10 CFR Part 20.103(e). By letter dated August 21, 1987, the licensee provided further justification for the exemption in response to our requests for additional information.

The licensee has provided test data and canister qualification information by reference to Mine Safety Appliances (MSA) Company data submitted in conjunction with a similar request by Alabama Power Company for the Joseph M. Farley Nuclear Plant, Units 1 and 2 (Docket Nos. 50-348 and 50-364). SERI has provided detailed information relating to the request for exemption to 10 CFR Part 20, Appendix A, footnote d-2(c). The exemption would allow the use of a radioiodine protection factor of 50 for MSA GMR-1 canisters to be used at the facility.

The licensee has maintained good fuel integrity with minimal leakage and uses process or engineered controls to the extent practicable to maintain airborne contamination exposures as low as reasonably achievable. However, in the event of significant failed fuel, airborne radioactive levels could exceed the capability afforded by these controls. This would require respiratory protection from radioiodine for workers needing to enter such an environment for maintenance or other purposes. The requested exemption would allow the use of an air-purifying respirator in lieu of supplied air or self-contained apparatuses for the workers in such an event. The less cumbersome air-purifying respirators can provide increased comfort and mobility in most cases, resulting in less physical effort and stress, increased worker efficiency and decreased personnel exposure time.

Criteria and background information used for the evaluation includes 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, "Criteria 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." The staff's discussion and evaluation of the request for exemption follows.

Since a National Institute for Occupational Safety and Health/Mine Safety Health Administration (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, as required by 10 CFR 20.103(e), that the licensee has demonstrated by testing, or by 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, for 8 hours. The main considerations of the staff's technical evaluation were canister efficiency and service life, including the effects of temperature, poisons, relative humidity, challenge concentration and breathing rates on canister efficiency and service life. The staff's programmatic evaluation considered quality control/quality assurance measures employed to assure canister performance, and radiation protection/ALARA measures, such as preparation and planning for work, on-the-job evaluations, use of engineering controls, radiological surveillance and radiological training.

The licensee has provided reliable test information which verifies that the sorbent canister selected (MSA GMR-I) will provide a protection factor of 50 for over a period of 8 hours of continuous use, provided that the total

challenge of radioactive and nonradioactive iodine and other halogenated compounds does not exceed 1 ppm and the temperature does not exceed 120°F, or the dewpoint does not exceed 107°F. The data provided by MSA shows the breakthrough point of the GMR-I canister 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), which is the most penetrating of the challenge forms. MSA data provided by the licensee indicates that the MSA GMR-I canisters perform adequately under the accepted test conditions. These conditions - the criteria and test methods - are consistent with those derived for the canisters by the staff in NUREG/CR-3403, and are acceptable.

The licensee has provided commitments that the MSA GMR-I canisters will meet the 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% acceptable quality limit (AQL) in a 5 to 10 ppm challenge concentration of CH₃I, 90% relative humidity, 110°F, 64 LPM cycle flow, for a service life of 8 hours or more at penetrations equal to 1% of the challenge concentration. Testing data provided by the licensee has demonstrated that performance (i.e., service life) of canisters at 100% relative humidity is acceptable.

Certain limitations and precautions based on the sorbent canister manufacturer's recommendations and NUREG/CR-3403 guidance are necessary for effective utilization of the sorbent canisters. The staff agrees with the following limitations and usage restrictions as proposed by the licensee:

1. Protection factor equal to 50 as maximum value.
2. The maximum permissible continuous use time is 8 hours, after which the canisters will be discarded.
3. Canisters are not to be used in the presence of organic solvent vapors.
4. Canisters are to be stored in sealed, humidity-barrier packaging in a cool, dry environment.*
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. Canisters are to be used with a full facepiece capable of providing protection factors greater than 100.
7. Canisters are not to be used in total challenge atmosphere concentrations of organic iodines and other halogenated compounds greater than 1.0 ppm, including nonradioactive compounds.
8. Canisters are not to be used in environments where the temperature exceeds 120°F or the dewpoint exceeds 107°F.

In addition to the limitations and usage restrictions noted above, the licensee will utilize the following administrative and procedural controls:

1. Temperatures will be measured each shift and/or coincidentally with operations which raise the temperature in work areas to ensure that temperatures do not exceed 120°F or the temperature corresponding to a dewpoint of 107°F during sorbent canister use.

*Sorbent canisters will be maintained in licensee Class "A" storage as defined in ANSI N452.2 after receipt onsite, except for those maintained for ready issue in the respirator issue area. The Class "A" storage area used to store the sorbent canisters at the Grand Gulf Nuclear Station will be a special temperature and humidity-controlled room in the main warehouse.

2. In the initial implementation of GMR-I canister use, the following program verification measures will be used:
 - a. weekly whole-body counts are to be provided for individuals using the sorbent canister for radioiodine protection;
 - b. for individuals who exceed 10 MPC hours in 7 consecutive days, a whole-body count will be required prior to their next entry into a radioiodine atmosphere (i.e., effectively a 10 MPC hour stay time);
 - c. if an individual measures 70 nCi or greater iodine uptake to the thyroid during a whole body count, the individual's entry into radioiodine atmospheres will be restricted pending health physics evaluation; and
 - d. a whole body count/survey data base will be compiled to evaluate the results of the program.

3. Grand Gulf Nuclear Station, Unit 1 procedures and administrative practices for chemical control currently exist which restrict painting and chemical releases in areas served by the standby gas treatment system (SGTS). Since use of the GMR-I canister will most likely be in the same areas served by the SGTS, the proposed environment for GMR-I canister use will be assured.

In addition, the licensee will revise health physics procedure 01-S-08-4 to incorporate the restrictions for use of GMR-I canisters. These revised procedures will restrict use of GMR-I canisters in areas where painting or use of organic vapors or chemicals is in progress or has recently been completed.

4. Existing respiratory protection program requirements and restrictions (e.g., physicals, fit tests, 10 CFR Part 20 requirements, Appendices A and B) still apply and the licensee will modify respiratory program lesson plans to include specific aspects of issue and use of GMR-I canisters.

Coupled with the use of a full facepiece and with the capability of providing a protection factor of greater than 100, the protection factor of 50 is conservative under these conditions. Canister efficiency will be retained for the radioiodine gas or vapors of interest (CH_3I , I_2 , HOI) for this time period (i.e., 8 hours). Additionally, the licensee has provided data which shows the breakthrough point to be well beyond 8 hours. To preclude aging, service life will be calculated from the time the canister is unsealed, including periods of non-use, and the canister will not be used in the presence of organic solvent vapors or high temperatures. 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 solvent vapors and chemicals (such as decontamination compounds, lubricants, volatilized paint, alcohols, freon) which could cause aging, poisoning, or desorption of the absorbed radioiodines. The licensee will modify their health physics and respiratory protection procedures regarding the proper use and limitations of MSA GMR-I canisters prior to use for radioiodine protection.

The primary bases for the licensee's request for exemption are not only the potentials for reduction of the physical work effort and stress on the worker, but also the potential for reduction in personnel exposure. On the basis of task analyses performed by two other licensees (Alabama Power Company

and Southern California Edison Company), SERI estimates that the utilization of air-purifying respirators in lieu of air-supplied or self-contained apparatuses, where possible, can result in overall dose savings of approximately 30% at the facility for tasks requiring radioiodine protection. The lightweight, 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 on-the-job time. The licensee has performed a task analysis based on the actual man-hours and person-rems expended during the facility's first refueling outage. This analysis shows that the use of sorbent canisters at the facility can result in significant dose savings and should be an effective ALARA measure.

Other actions taken by the licensee to ensure that exposures to radioiodine are as low as is reasonably achievable are: conduct of radioiodine air sampling before and during activities involving the use of sorbent canisters for radioiodine protection; use of engineering controls such as negative pressure ventilation blowers and the drywell purge system to reduce airborne levels to as low as practical levels; use of the offgas system and condensate demineralizers to reduce radioiodine concentrations during normal power operations; area decontamination to control contamination levels; and maintenance planning for scheduled outages to allow for radioiodine decay times, where practicable, prior to major breeches of contaminated systems. Whole-body counts will be conducted routinely (e.g., weekly and at 10 MPC hours) for individuals using the sorbent canisters for radioiodine protection and radioiodine data will be trended to detect problems; an investigation level for radioiodine uptakes has been established (at 70 nCi); training of workers and health physics technicians in the use and

restrictions for use of sorbent canisters for radioiodine protection will be conducted prior to their use; and procedures iterating the controls, restrictions, and requirements have been developed and will be implemented. The licensee's efforts to keep exposure ALARA are consistent with our positions in Regulatory Guide 8.8 and are acceptable.

In summary, the staff's review of the licensee's proposal indicates that the licensee has maintained good fuel integrity with minimal leakage at the facility since startup commenced in 1982. Through the use of process and engineering controls, the licensee is committed to maintaining exposures to airborne contamination as low as reasonably achievable. However, in the event of significant failed fuel, it is conceivable that airborne radioiodine levels may exceed the protection capability provided by these controls. For this reason, the licensee has requested an exemption for the use of a radioiodine protection factor for sorbent canisters to provide respiratory protection from radioiodine for workers who would be required to enter such an environment where the airborne radioiodine concentration exceeds 25% of MPC. 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 ensure an effective radioiodine protection program. The proposed criteria and test methods for verifying the effectiveness and quality of GMR-1 canisters are consistent with the staff's criteria. The licensee's proposed exemption, with the controls and limitations, meets the staff's positions in the Standard

Review Plan, 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 granting of an exemption in accordance with the provisions of 10 CFR Part 20.103(e).

III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 20.501, an exemption is authorized by law and will not result in undue hazard to life or property. The Commission hereby grants an exemption from the requirements of footnote d-2(c) of Appendix A of 10 CFR Part 20 to permit the use of Mine Safety Applicances (MSA) GMR-1 canisters at the Grand Gulf Nuclear Station, Unit 1.

It is further determined that the exemption does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. In light of this determination and as reflected in the Environmental Assessment and Finding of No Significant Impact prepared pursuant to 10 CFR 51.1 and 51.30 through 51.32, and published on November 18, 1987 (52 FR 44239), it was concluded that the instant action is insignificant from the standpoint of environmental impact and an environmental impact statement need not be prepared.

For further details with respect to this action, see the licensee's requests dated June 29, 1987, as supplemented August 21, 1987, which are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the Hinds Junior College, McLendon Library, Raymond, Mississippi 39154.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Dated at Bethesda, Maryland
this 19th day of November 1987