

Docket No.: 50-482

December 3, 1986

Mr. Glenn L. Koester
Vice President - Nuclear
Kansas Gas and Electric Company
201 North Market Street
P. O. Box 208
Wichita, Kansas 67201

Dear Mr. Koester:

Subject: Issuance of Exemption to 10 CFR Part 20, Appendix A,
Footnote d-2(c) - Wolf Creek Generating Station

The Nuclear Regulatory Commission has granted the enclosed Exemption which allows the use of a radioiodine protection factor of 50 for certain respiratory protection canisters used by workers at the Wolf Creek Generating Station. The Exemption was granted in response to your letters dated July 1 and November 8, 1985, and May 6, 1986.

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.

The Exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

151

Paul O'Connor, Project Manager
PWR Project Directorate #4
Division of PWR Licensing-A

Enclosures:

1. Exemption
2. Safety Evaluation

cc w/enclosures: See next page

DISTRIBUTION:
See next page

PWR#4/DPWR-A
MDuncan/mac
11/4/86

Pwoe
PWR#4/DPWR-A
PO'Connor
11/4/86

PJB
PWR#4/DPWR-A
BJYoungblood
11/19/86

Mr. Glenn L. Koester
Kansas Gas and Electric Company

Wolf Creek Generating Station
Unit No. 1

cc:

Mr. Nicholas A. Petrick
Executive Director, SNUPPS
5 Choke Cherry Road
Rockville, Maryland 20850

Mr. Gary L. Haden, Director
Research & Energy Analysis
Kansas Corporation Commission
4th Floor - State Office Building
Topeka, Kansas 66612-1571

Jay Silberg, Esq.
Shaw, Pittman, Potts & Trowbridge
2300 N Street, NW
Washington, D.C. 20037

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
Office of Executive Director
for Operations
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

J.M. Evans
Vice President - System Power Operation
Kansas City Power & Light Company
1330 Baltimore Avenue
Kansas City, Missouri 64141

Mr. Allan Mee
Project Coordinator
Kansas Electric Power Cooperative, Inc.
P. O. Box 4877
Gage Center Station
Topeka, Kansas 66604

Chris R. Rogers, P.E.
Manager, Electric Department
Public Service Commission
P. O. Box 360
Jefferson City, Missouri 65102

Resident Inspector/Wolf Creek NPS
c/o U.S. Nuclear Regulatory Commission
P. O. Box 311
Burlington, Kansas 66839

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Mr. Brian Moline
Chief Legal Counsel
Kansas Corporation Commission
4th Floor - State Office Building
Topeka, Kansas 66612-1571

Senior Resident Inspector/Wolf Creek
c/o U. S. Nuclear Regulatory Commission
P. O. Box 311
Burlington, Kansas 66839

Mr. Robert Elliot, Chief Engineer
Utilities Division
Kansas Corporation Commission
4th Floor - State Office Building
Topeka, Kansas 66612-1571

Mr. Otto Maynard, Manager Licensing
Kansas Gas and Electric Company
PO Box 309
Burlington, Kansas 66839

Mr. Gerald Allen
Public Health Physicist
Bureau of Air Quality & Radiation
Control
Division of Environment
Kansas Department of Health
and Environment
Forbes Field Building 321
Topeka, Kansas 66620

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)	
)	
Kansas Gas and Electric Company)	
)	
Kansas City Power & Light Company)	Docket No. 50-482
)	
Kansas Electric Power Cooperative, Inc.)	
)	
(WOLF CREEK GENERATING STATION))	

EXEMPTION

I.

Kansas Gas and Electric Company, Kansas City Power & Light Company, and Kansas Electric Power Cooperative, Inc. (the licensee) are the holders of Facility Operating License No. NPF-42, issued June 4, 1985, which authorizes operation of the Wolf Creek Generating Station (the facility) at steady-state reactor power levels not in excess of 3411 megawatts thermal. This license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission now or hereafter in effect. The facility consists of a pressurized water reactor located in Coffey County, Kansas.

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 sorbents 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.

However, 10 CFR Part 20.103(e) allows an exemption to be authorized 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 makes such an application.

By letter dated July 1, 1985, as supplemented by letters dated November 8, 1985, and May 6, 1986, the licensee requested an exemption based on 10 CFR 20.103(e) to allow the use of a protection factor of 50 when utilizing radioiodine GMR-I canisters for personnel respiratory protection during scheduled refueling outage work. The licensee cited research data, test results, test protocol and a quality assurance sampling plan that it stated satisfies the recommended qualification process of NUREG/CR-3403. The Commission staff evaluated the information provided by the licensee to support the exemption request. The Commission's safety evaluation on this matter relating to the use of a radioiodine protection factor for GMR-I canisters at Wolf Creek has been issued. The safety evaluation concludes that the licensee's proposed use of radioiodine 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 July 1, 1985, and supplemented November 8, 1985, and May 6, 1986, is authorized by law and will not result in undue hazard to life or property. The Commission hereby grants an exemption from the restrictions of 10 CFR Part 20, Appendix A, footnote d-2(c), and authorizes the use of the 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 (51 FR42950).

This Exemption is effective upon issuance.

Dated at Bethesda, Maryland this 3rd day of December 1986.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by:
Thomas M. Novak

Thomas M. Novak, Acting Director
Division of PWR Licensing-A
Office of Nuclear Reactor Regulation

Attachment:
As stated

* SEE PREVIOUS CONCURRENCES

PWR#4/DPWR-A
*MDuncan/mac
11/04/86

PWR#4/DPWR-A
*PO'Connor
11/04/86

OGC/BETHESDA
*MKarman
11/04/86

PWR#4/DPWR-A
BJYoungblood
11/17/86

AD/DPWR-A
TMNovak
12/2/86

Attachment 1

Limitations, Usage Restrictions, and Controls Applicable to the Use of GMR-1 Canister at the Wolf Creek Generating Station

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 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. Canister is 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 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 120°F, or dewpoint exceeds 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 coincidently with the use of GMR-I canisters to assure that work temperatures do not exceed 120°F or temperature corresponding to a dewpoint of 107°F during sorbent canister use.
2. In the initial implementation of sorbent canister use, the following program verification measures will be used:
 - a. weekly whole body counts for individuals using the sorbent canister for radioiodine protection;
 - b. for individuals who exceed 10 MPC hours in seven 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 70nCi 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;
 - d. a whole body count/survey data base will be compiled to evaluate the results of the program.

*Sorbent canisters will be stored in conditions not to exceed 90°F or 70% humidity in accordance with Procedure HPH 06-XXX (currently in draft).



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 WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

INTRODUCTION

By submittals dated July 1, 1985, November 8, 1985 and May 6, 1986, Kansas Gas and Electric Company, Kansas City Power & Light Company, and Kansas Electric Power Cooperative, Inc., (the licensee) have requested an exemption to 10 CFR Part 20, Appendix A, footnote d-2(c). The licensee submitted this request in accordance with 10 CFR Part 20.103(e) and provided further justification for the exemption in response to our requests for additional information.

Test data and canister qualification information have been provided by the licensee by reference to Mine Safety Appliances Company (MSA) data submitted in conjunction with a similar exemption request for Farley 1&2 by Alabama Power Company. The licensee has provided a detailed response to all NRC staff concerns 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-I canisters at the Wolf Creek Generating Station power reactor facility. 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, "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."

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.

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 CH_3I (methyl iodide/methyl radioiodide), which is the most penetrating of the challenge forms. Data provided from MSA indicate 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 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 CH_3I , 90% relative humidity, 110°F, 64 LPM cyclic flow, for a service life of 8 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 of greater than 100, to be determined by fit test, 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. To preclude aging, service life will be calculated 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, volatilized 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 such 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 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. Canister is 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 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 120°F, or dewpoint exceeds 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 coincidently with the use of GMR-I canisters to assure that work temperatures do not exceed 120°F or temperature corresponding to a dewpoint of 107°F during sorbent canister use.
2. In the initial implementation of sorbent canister use, the following program verification measures will be used:
 - a. weekly whole body counts for individuals using the sorbent canister for radioiodine protection;
 - b. for individuals who exceed 10 MPC hours in seven 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 70nCi 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;
 - d. a whole body count/survey data base will be compiled to evaluate the results of the program.

*Sorbent canisters will be stored in conditions not to exceed 90°F or 70% humidity in accordance with Procedure HPH 06-XXX (currently in draft).

3. Technical Specification controls which currently exist restrict painting and chemical releases in areas served by safety related ventilation filtration systems. These restrictions additionally serve for GMR-I use in these areas. For other areas, painting or the use of organic substances will be prohibited while the GMR-I canister is in use. Current controls (Procedure ADM 04-030, "Use of Plant Chemical and Cleaning Agents") prohibit the use of paint or organic solvents without a safety review, and will be applied to GMR-I use.
4. Specific plant procedures will incorporate the limitations and usage restrictions, listed as 1 through 8 above, prior to GMR-I canister use. Additionally, a specific procedure has been prepared for field use of the GMR-I canisters.
5. Existing respiratory protection program requirements and restrictions (e.g., physicals, fit tests, Part 20 requirements, Appendices A and B) still apply.

The primary bases for the licensee's request for exemption are the potentials for both work effort reduction 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. The licensee has provided a task analysis which shows that the use of sorbent canisters at Wolf Creek can result in significant dose savings and should be an effective ALARA measure.

Other actions taken by KG&E 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 local HEPA ventilation and the containment purge system to reduce airborne levels to as low as practical levels; purification and degasification of the primary coolant conducted prior to refueling resulting in reduced radioiodine levels; 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 (e.g., weekly and at 10 MPC hours) 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.

Safety Summary

Our 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 our positions in the SRP, 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).

Principal Contributor: Richard Serbu

Dated: December 3, 1986

EXEMPTION FOR WOLF CREEK GENERATING STATION

Dated December 3, 1986

DISTRIBUTION:

Docket File
NRC PDR
Local PDR
PRC System
PWR#4 Reading
M. Duncan
B. J. Youngblood
P. O'Connor
OGC/Bethesda
L. Harmon
E. Jordan
B. Grimes
J. Partlow
R. Diggs
T. Barnhart (4)
W. Jones
N. Thompson
E. Butcher
ACRS (10)
FOB
OPA