Docket No. 50-305

DEC 29 1975

Wisconsin Public Service Corporation
ATTN: Mr. E. W. James
Senior Vice President
Post Office Box 1200
Green Bay, Wisconsin 54305

Gentlemen:

Our letter of December 6, 1974, discussed a need for additional Limiting Conditions for Operation and Surveillance Requirements related to the filter systems installed at the Kewaunee Nuclear Power Plant. We requested that you submit an application for amendment to your license that would change the Technical Specifications relating to these installed filter systems. Your letter of February 14, 1975, submitted a request for amendment to add Technical Specifications for the Control Room filtration system. Your letter of October 28, 1975, requested withdrawal of the February 14 request for amendment since no credit has been taken for the Control Room filtration system in the Safety Analysis. We agree that no technical specification is required for this system.

Your letter of October 28, 1975, also states that, because of a superior containment system, you do not feel that additional limiting conditions and surveillance requirements on other filter systems in the plant are necessary. For filter systems unrelated to your containment system and filter systems for which no credit was taken in the accident analyses, we agree that the existing technical specifications are adequate. However, the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System are vital elements of your containment system and their efficient performance must be assured. Similarly, the Spent Fuel Pool Sweep System was taken credit for in the analysis of a refueling accident and must, therefore, be available and capable of operating at the efficiencies assumed in the accident analysis.

The present technical specifications for these three systems do not provide the high degree of assurance we believe to be necessary that the systems will perform when called upon with the degree of efficiency that was part of the basis for issuance of the operating license.

Because of the potential adverse effects on public health and safety which could result from an accident while operating with the present requirements on the installed filter systems, we believe that changes to the Technical Specifications are needed to assure that the installed filter systems at Kewaunee will function reliably, when needed, at a level of efficiency at least equal to that assumed in our accident analyses for the plant. The basis for this position is provided in our Safety Evaluation, a copy of which is enclosed. Accordingly, unless you inform us in writing, within 20 days of the date of this letter, that you do not agree with this course of action, including your reasons, we plan to initiate steps to issue the enclosed change to the Technical Specifications of Kewaunee.

Sincerely,

Original signed by
R. A. Purple

Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Reactor Licensing

Enclosures:
1. Proposed Changes to Technical Specifications
2. Safety Evaluation

ccs: See next page

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3.6 CONTAINMENT SYSTEM

Applicability

Applies to the integrity of the Containment System.

Objective

To define the operating status of the Containment System.

Specification

a. Containment System integrity shall not be violated if there is fuel in the reactor which has been used for power operation, except whenever either of the following conditions remains satisfied:

   1. The reactor is in the cold shutdown condition with the reactor vessel head installed, or

   2. The reactor is in the refueling shutdown condition.

b. All of the following conditions shall be satisfied whenever Containment System integrity as defined by Specification 1.g is required:

   1. Both circuits of the Shield Building Ventilation System, including filters and heaters shall be operable or the reactor shall be shut down within 12 hours, except that when one of the two circuits of the Shield Building Ventilation System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days provided that all active components of the other circuit shall be demonstrated to be operable within 2 hours and daily thereafter.

   2. Both circuits of the Auxiliary Building Special Ventilation System including filters and heaters shall be operable or the reactor shall be shut down within 12 hours, except that when one of the two circuits of the Auxiliary Building Special Ventilation System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding seven days provided that all active components of the other circuit shall be demonstrated to be operable within 2 hours and daily thereafter.

   3. Performance Requirements

      A. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq$99% DOP removal and $\geq$99% halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.

      B. The results of laboratory carbon sample analysis from the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System carbon shall show $\geq$90% radioactive methyl iodine removal when tested in accordance with ANSI N510-1975 (130^{o}C, 95% R.H.).

      C. Fans shall operate within $\pm$10% of design flow when tested in accordance with ANSI N510-1975.

c. If the internal pressure of the Reactor Containment Vessel exceeds 2 psi, the condition shall be corrected within eight hours or the reactor shall be placed in a subcritical condition.

d. The Reactor shall not be taken above the cold shutdown condition unless the containment ambient temperature is greater than 40°F.

Basis

Proper functioning of the Shield Building Ventilation System is essential to the performance of the Containment System. Therefore, except for reasonable periods of maintenance outage for one redundant chain of equipment, the complete system should be in readiness whenever Containment System integrity is required. Proper functioning of the Auxiliary Building Special Ventilation System is similarly necessary to preclude possible unfiltered leakage through penetrations that enter the Special Ventilation Zone (Zone SV).

Both the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System are designed to automatically start following a safety injection signal. Each of the two circuits of both systems has 100% capacity. If one circuit of either system is found to be inoperable, there is not an immediate threat to the containment system performance and reactor operation may continue while repairs are being made. If both circuits of either system are inoperable, the plant will be brought to a condition where the treatment system would not be required.

High efficiency particulate air (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential radioiodine release to the atmosphere. Bypass leakage for the charcoal adsorbers and particulate removal efficiency for HEPA filters are determined by halogenated hydrocarbon and DOP respectively. The laboratory carbon sample test results indicate a radioactive methyl iodide removal efficiency for expected accident conditions. Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers. If the performances are as specified, the calculated doses would be less than the guidelines stated in 10 CFR Part 100 for the accidents analyzed.

The cold shutdown condition precludes any energy releases or buildup of containment pressure from flashing of reactor coolant in the event of a system break. The restriction to fuel that has been irradiated during power operation allows initial testing with an open containment when negligible activity exists. The shutdown margin for the cold shutdown condition assures subcriticality with the vessel closed. even if the most reactive RCC assembly were inadvertently withdrawn. Therefore, the two parts of Specification 3.6.a allow Containment System integrity to be violated when a fission product inventory is present only under circumstances that preclude both criticality and release of stored energy.

When the reactor vessel head is removed with the Containment System integrity violated, the reactor must not only be in the cold shutdown conditions, but also in the refueling shutdown condition. This 10% shutdown margin prevents the occurrence of criticality under any circumstances, even when fuel is being moved during refueling operations.

The requirement of a 40°F minimum containment ambient temperature is to assure that the minimum vessel metal temperature is well above NDTT + 30° criterion for the shell material.

This specification also prevents positive insertion of reactivity whenever Containment System integrity is not maintained if such addition would violate the respective shutdown margins. Effectively, the boron concentration must be maintained at a predicted concentration of 2000 ppm(1) or more if the Containment System is to be disabled with the reactor pressure vessel open.

The 2 psi limit on internal pressure provides adequate margin between the maximum internal pressure of 46 psig and the peak accident pressure of 42.2 psig resulting from the postulated Design Basis Accident.[2]

The Reactor Containment Vessel is designed for 0.8 psi internal vacuum, the occurrence of which will be prevented by redundant vacuum breaker systems.

References:

(1) FSAR Table 3.2-1

(2) FSAR Section 5

6. Direct communication between the control room and the operating floor of the containment shall be available whenever changes in core geometry are taking place.

7. No heavy loads will be transported over or placed in either part of the spent fuel pool when spent fuel is stored in that part.

8. The containment ventilation and purge system, including the radiation monitors which initiate containment ventilation isolation, shall be tested and verified to be operable immediately prior to a refueling operation.

9. A. The Auxiliary Building Special Ventilation System shall be demonstrated to be operable prior to fuel handling. The spent fuel pool sweep system, including the charcoal adsorbers shall be operable during fuel handling. If the spent fuel pool sweep system is not operable fuel movement shall not be started (any fuel assembly movement in progress may be completed).

   B. Performance Requirements

      (1) The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq$99% DOP removal and $\geq$99% halogenated hydrocarbon removal when tested in accordance with ANSI N510-1975.

      (2) The results of laboratory carbon sample analysis from spent fuel pool sweep system carbon shall show $\geq$90% radioactive methyl iodide removal when tested in accordance with ANSI N510-1975 (130°C, 95% R.H.).

      (3) Fans shall operate within $\pm$10% of design flow when tested in accordance with ANSI N510-1975.

10. The minimum water level above the vessel flange shall be maintained at 23 feet, except during initial core loading.

11. A dead-load test shall be successfully performed on both the fuel handling and manipulator cranes before fuel movement begins. The load assumed by the cranes for this test must be equal to or greater than the maximum load to be assumed by the cranes during the refueling operation. A thorough visual inspection of the cranes shall be made after the dead-load test and prior to fuel handling.

12. A licensed senior reactor operator will be on site and designated in charge of the refueling operation.

b. If any of the specified limiting conditions for refueling are not met, refueling of the reactor shall cease. Work shall be initiated to correct the violated conditions so that the specified limits are met, and no operations which may increase the reactivity of the core shall be performed .

Basis

The equipment and general procedures to be utilized during refueling are discussed in the FSAR. Detailed instructions, the above specified precautions, and the design of the fuel handling equipment incorporating built-in interlocks and safety features, provide assurance that no incident occurs during the refueling operations that would result in a hazard to public health and safety.[1] Whenever changes are not being made in core geometry, one flux monitor is sufficient. This permits maintenance of the instrumentation. Continuous monitoring of radiation levels (2 above) and neutron flux provides immediate indication of an unsafe condition. The residual heat removal pump is used to maintain a uniform boron concentration.

The shutdown margin indicated in Part 5 will keep the core subcritical, even if all control rods were withdrawn from the core. During refueling, the reactor refueling cavity is filled with approximately 275,000 gallons of borated water. The boron concentration of this water is sufficient to maintain the reactor subcritical by approximately 10% Δ k/k in the cold condition with all rods inserted, and will also maintain the core subcritical even if no control rods were inserted into the reactor.[2] Periodic checks of refueling water bbron concentration insure that proper shutdown margin is maintained. Part 6 allows the control room operator to inform the manipulator operator of any impending unsafe condition detected from the main control board indicators during fuel movement.

Interlocks are utilized during refueling to ensure safe handling. Only one assembly at a time can be handled. The fuel handling hoist is dead weight tested prior to use to assure proper crane operation. It will not be possible to lift or carry heavy objects over the spent fuel pool when fuel is stored therein, through interlocks and administrative procedures.

The one hundred hour decay time following plant shutdown is consistent with the assumption used in the dose calculation for the fuel handling accident. The requirement for the Auxiliary Building Special Ventilation to be operable and spent fuel pool sweep system, including charcoal adsorbers, to be operable when spent fuel movement is being made provides added assurance that the offsite doses will be within acceptable limits in the event of a fuel handling accident. The spent fuel pool sweep system is designed to filter the refueling building atmosphere prior to release to the facility vent during refueling. Normally the charcoal adsorbers are bypassed, but during refueling bypass dampers are closed. The bypass dampers also close on a high radiation signal. If the dampers do not close tightly, bypass leakage could exist to negate the usefulness of the charcoal adsorber. If the spent fuel pool sweep system is found not to be operable all fuel handling will be terminated until the system can be restored to the operating condtion.

High efficiency particulate air (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential radioiodine releases to the atmosphere. Bypass leakage for the charcoal adsorbers and particulate removal efficiency for HEPA filters are determined by halogenated hydrocarbon and DOP respectively. The laboratory carbon sample test results indicate a radioactive methyl iodide removal efficiency for expected accident conditions. Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers. If the performances are as specified, the calculated doses would be less than the guidelines stated in 10 CFR Part 100 for the accidents analyzed.

The presence of a licensed senior reactor operator at the site and designated in charge provides qualified supervision of the refueling operation during changes in core geometry.[3]

References:

(1) FSAR Section 9.5.2
(2) FSAR Table 3.2-1
(3) FSAR Section 13.2.1

to this value.

c. Residual Heat Removal System

1. Those portions of the Residual Heat Removal System external to the isolation valves at the containment shall be hydrostatically tested at 350 psig at each major refueling outage, or they shall be tested during their use in normal operation at least once between successive major refueling outages.

2. The total leakage from either train shall not exceed two gallons per hour. Visible leakage that cannot be stopped at test conditions shall be suitably measured to demonstrate compliance with this Specification.

3. Any repairs necessary to meet the specified leak rate shall be accomplished within seven days of resumption of power operation.

d. Shield Building Ventilation System

1. At least once per operating cycle, or once every 18 months, whichever occurs first, the following conditions shall be demonstrated:

   A. Pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at the system design flow rate ($\pm$10%).

   B. Air distribution is uniform within 20% across HEPA filters and charcoal adsorbers when tested in accordance with ANSI N510-1975.

   C. Automatic initiation of each branch of each emergency and treatment system.

   D. Operability of heaters at rated power when tested in accordance with ANSI N510-1975.

2. A. The tests and analysis of Specification 3.6.b.3 shall be performed at least once per operating cycle or once every 18 months, whichever occurs first, or after every 720 hours of system operation or following painting, fire, or chemical release in any ventilation zone communicating with the system.

   B. Cold DOP testing shall be performed after each complete or partial replacement of a HEPA filter bank or after any structural maintenance on the system housing.

   C. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of a charcoal adsorber bank or after any structural maintenance on the system housing.

   D. Each circuit shall be operated with the heaters on at least 10 hours every month.

3. Each train shall be determined to be operable at the time of its periodic test if it produces measurable indicated vacuum in the annulus within two minutes after initiation of a simulated safety injection signal and obtains equilibrium discharge conditions that demonstrate the Shield Building leakage is within acceptable limits.

e. Auxiliary Building Special Ventilation System

1. Periodic tests of the Auxiliary Building Special Ventilation System, including the door interlocks, shall be performed in accordance with Specifications 4.4.d.1 and 4.4.d.2.

2. Each system shall be determined to be operable at the time of periodic test if it starts with coincident isolation of the normal ventilation ducts and produces a measurable vacuum throughout the Special Ventilation Zone with respect to the outside atmosphere.

f. Containment Vacuum Breaker System

The power operated valve in each vent line shall be tested during each refueling outage to demonstrate that a simulated containment vacuum of 0.5 psi will open the valve and a simulated accident signal will close the valve. The check and butterfly valves will be leak tested in accordance with specification 4.4.b during each refueling.

Basis

The Containment System consists of a steel Reactor Containment Vessel within a concrete Shield Building and a Shield Building Ventilation System which, in the event of a loss-of-coolant accident, will produce a vacuum in the Shield Building annulus and will cause all leakage from the Reactor Containment Vessel to be mixed in the annulus volume and recirculated through a filter system before its deferred release to the environment through the exhaust fan that maintains vacuum in the annulus. Potential leakage from the RHRS or from the majority of lines that span the Shield Building annulus is collected in a special ventilation zone of the Auxiliary Building and filtered before its release.

The free-standing Reactor Containment Vessel is designed to accommodate the maximum internal pressure that would result from the Design Basis Accident.[1] For initial conditions typical of normal operation, 120°F and 15 psia, an instantaneous double-ended break with minimum safety features results in a peak pressure of 42.2 psig at 268°F.

The containment has been successfully strength-tested at 51.8 psig and leak tested at 46.0 psig to meet acceptance specifications prior to installation of penetrations.

The safety analysis[2] is based on a conservatively chosen reference set of assumptions regarding the sequence of events relating to activity release and attainment of vacuum in the Shield Building annulus, the effectiveness of filtering, and the leak rate of the Reactor Containment Vessel as a function of time. The effects of variation in these assumptions, including that for leak rate, have been investigated thoroughly. A summary of the items of conservatism involved in the reference calculation and the magnitude of their effect upon off-site dose demonstrates the collective effect of conservatism in these assumptions. (Refer to Appendix H, FSAR)

The reference initial leak rate in this analysis is 0.5 weight percent of air per 24 hours at the peak pressure of the Design Basis Accident. The resulting two-hour doses at the nearest site boundary are significantly less than the guidelines presented in 10CFR100.

The pre-operational integrated leak rate tests are specified at both full design pressure and at reduced pressure, with later periodic tests performed only at reduced pressure, as suggested in the relevant AEC guide(3), and at the frequency indicated in the guide for the design and leak rate test pressures. The operational limit on leak rate $L_{tm} = 0.75\ L_t$, provides a 25 percent allowance for possible leakage deterioration between integrated leak rate tests. The six-month allowance on test schedule provides flexibility necessary to permit tests to be performed at times of scheduled or unscheduled plant outage.

The frequent leak-testing of isolation valves and other penetrations, (areas which may reasonably be expected to be responsible for any excess leakage, rather than the containment shell itself) will provide reassurance, approximately annually, that the allowable leak rate limit is met. These tests will also indicate specific areas of deterioration that may warrant repair before their leakage is excessive.

The Residual Heat Removal System functionally becomes a part of the containment volume during the post-accident period when its operation is changed over from the injection phase to the recirculation phase. Redundancy and independence during this period, and the possible consequences of leakage are relatively minor relative to those of the Design Basis Accident(2); however, the partial role of the RHR System in containment warrants surveillance of its leak-tightness.

The Shield Building Ventilation System consists of two independent systems that have only a discharge point in common, the Containment System Vent. Both systems are normally activated and one alone must be capable of accomplishing the design function of the system. The periodic tests will demonstrate the capability of both the separate and combined systems.

Reliable simulation of the transient effects of accident-related heat flow from the Reactor Containment Vessel to the annulus appears to be difficult as well as inconvenient, and the necessary differences between any test conditions and predicted accident conditions would still require supporting analysis. Only the heat input to the annulus could be test-simulated, and not the heat transfer which determines the heat input. However, analysis supported by the results of actual tests without heat addition will provide reliable means of determining system performance with heat addition. The major uncertainties in system performance relate to such "as-built" considerations as Shield Building in-leakage, actual system losses, and overall transient response. These areas can be directly refined in the analysis model from the results of the tests specified. The effects of heat addition are readily incorporated, in a conservative manner where necessary, by considering extreme variations of heat transfer coefficients and transient containment temperature conditions. Such analysis performed during final design has demonstrated, for example, that a slight increase in the capacity of the fans was sufficient to accommodate more sever assumptions regarding heat transfer through the shell. It is expected that nearly any deviation in system behavior discovered during initial testing can be similarly offset by increases in the capacity of these fans, which have minimal power requirements (12 hp and 1 hp for the recirculation and discharge fans, respectively).

Several penetrations of the Reactor Containment Vessel and the Shield Building could, in the event of leakage past their isolation valves, result in leakage being conveyed across the annulus by the penetrations themselves thus bypassing the function of the Shield Building Ventilation System.(4) Such leakage is estimated not to exceed eleven percent at most of the Containment Vessel leakage; however, an entire area of the Auxiliary Building has medium leakage construction and controlled access and is designated as the Special Ventilation Zone where such leakage would be collected by either of two redundant trains of the Auxiliary Building Special Ventilation System. This system, when activated, will replace the normal ventilation and draw a vacuum throughout the zone such that all out-leakage will be through particulate and charcoal filters which exhaust to the Auxiliary Building Vent

The testing requirements for the filter units of the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System will ensure removal of radioactivity consistent with the assumptions made in the analysis of the Design Basis Accident.(2)

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than 6 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. A test frequency of once per operating cycle establishes system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Replacement adsorbent should be qualified according to the guidelines of Regulatory Guide 1.52 dated June 1973. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly, and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If the iodine removal efficiency test results are unacceptable, all adsorbent in the system should be replaced. Any HEPA filters found defective should be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52 dated June 1973.

Operation of the system every month will demonstrate operability of the filters and adsorber system. Operation for 10 hours is used to reduce the moisture built up on the adsorbent.

If painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals, or foreign materials, the same tests and sample analysis should be performed as required for operational use.

Demonstration of the automatic initiation capability is necessary to assure system performance capability.

References:

(1) FSAR Section 5

(2) FSAR Section 14.3.3

(3) Proposed 10 CFR Part 50, Appendix J (Revised)

(4) FSAR Section 5.5

4.12 SPENT FUEL POOL SWEEP SYSTEM

Applicability

Applies to testing and surveillance requirements for the spent fuel pool sweep system in Specification 3.8.a.9.

Objective

To verify the performance capability of the spent fuel pool sweep system.

Specification

a. At least once per operating cycle or once every 18 months, whichever occurs first, the following conditions shall be demonstrated:

   1. Pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at the system design flow rate (±10%).

   2. Air distribution is uniform within 20% across HEPA filters and charcoal adsorbers when tested in accordance with ANSI N510-1975.

   3. Automatic initiation of each branch of the treatment system.

b. 1. The tests and analysis for the system shall be performed at least once per operating cycle or once every 18 months, whichever occurs first, or after every 720 hours of system operation or following painting, fire, or chemical release in any ventilation zone communicating with the system.

   2. Cold DOP testing shall be performed after each complete or partial replacement of a HEPA filter bank or after any structural maintenance on the system housing.

   3. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of a charcoal adsorber bank or after any structural maintenance on the system housing.

Basis

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than 6 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. A test frequency of once per operating cycle establishes system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. Replacement adsorbent should be qualified according to the guidelines of Regulatory Guide 1.52 dated June 1973. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly, and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. If the iodine removal efficiency test results are unacceptable, all adsorbent in the system should be replaced. Any HEPA filters found defective should be replaced with filters qualified pursuant to Regulatory Position C.3.d of Regulatory Guide 1.52 dated June 1973.

If painting, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals, or foreign materials, the same tests and sample analysis should be performed as required for operational use.

Demonstration of the automatic initiation capability is necessary to assure system performance capability.

TABLE 4.1-3

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

	Equipment Tests***	Test	Frequency	Maximum Time Between Tests (Days)
1.	Control Rods	Rod drop times of all full length rods	Each refueling outage	N.A.
		Partial movement of all rods	Every 2 weeks	17
1a.	Reactor Trip Breakers	Open trip	Monthly	37
1b.	Reactor Coolant Pump Breakers-Open-Reactor Trip	Operability	Each refueling outage	N.A.
2.	Pressurizer Safety Valves	Set point	One each refueling outage	N.A.
3.	Main Steam Safety Valves	Set point	Two each refueling outage	N.A.
4.	Containment Isolation Trip	Operability	Each refueling outage	N.A.
5.	Refueling System Interlocks	Operability	Prior to each refueling outage	N.A.
6.	Ventilation System a. Control Room b. Shield Building c. Auxiliary Building d. Purge and Vent e. Spent Fuel Pool	Charcoal Filter Pressure Drop Test Visual Inspection	Prior to each refueling outage except as specified in Note**	N.A.
7.	Fire Protection Pump and Power Supply	*Operability	Monthly	37
8.	Containment Leak Detect.	Operability	Weekly	8
9.	Diesel Fuel Supply	*Fuel inventory	Weekly	8
10.	Turbine Stop and Governor Valves	Operability	Monthly(1)	37(1)
11.	Fuel Assemblies	Visual Inspection	Each refueling outage	N.A.
12.	Guard Pipes	Visual Inspection	Each refueling outage	N.A.

Notes

* See Specification 4.1.d.
** Tests and frequency shall be in accordance with Specifications 4.4.d and 4.12.
*** Following maintenance on the above equipment that could affect the operation of the equipment tests should be performed to verify operability.

(1) Temporary extension granted from February 1, 1975 to April 1, 1975 (59 days).

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS

WISCONSIN PUBLIC SERVICE CORPORATION

WISCONSIN POWER AND LIGHT COMPANY

MADISON GAS AND ELECTRIC COMPANY

KEWAUNEE NUCLEAR POWER PLANT

DOCKET NO. 50-305

I. Introduction

By letter of December 6, 1974, we requested the licensee to submit an application for amendment to Facility License No. DPR-43 that would change the Technical Specifications related to the testing and surveillance of the installed filter systems. The Technical Specification changes were to ensure high confidence that the filter systems would function reliably, when needed, at a level of efficiency equal to at least that assumed in our accident analyses for the plant. By letter dated February 14, 1975, the licensee responded with a request for amendment which would add Technical Specifications relating to the control room filtration, but did not provide the additional surveillance requirements to filtration systems specified in Technical Specifications as requested by our letter. Subsequent discussions with the licensee indicate that he feels the present surveillance requirements are adequate. Also, the licensee has reconsidered the request for amendment to his license relating to control room Technical Specifications and has requested withdrawal by letter dated October 28, 1975. For the reasons set forth in this evaluation, the February 14, 1975, response from the licensee was found unacceptable, and, appropriate changes to the Technical Specifications are required to assure the proper operation of the installed filter systems under postulated accident conditions.

II. Discussion

There are three filter systems at Kewaunee that are used to mitigate the radiological consequences of accidents and for which credit was taken in the analyses in the safety evaluation leading to a conclusion that such consequences are acceptable. These three system are the Shield Building Ventilation System (SBVS), the Auxiliary Building Special Ventilation System (ABSVS), and the spent fuel pool sweep system.

The present status of technical specifications for these systems and the changes to the Technical Specifications that we believe to be necessary are discussed below.

A. Shield Building Ventilation System (SBVS) and Auxiliary Building Special Ventilation System (ABSVS).

The SBVS and ABSVS are needed following a LOCA to mitigate the consequences of the accident. The existing Technical Specifications require that these systems be operable when containment integrity is required but there is no time limit specified to shut the plant down if the systems are not operable. Pressure drop measurements across the filter banks are required in the existing Technical Specifications but no value is specified for the pressure drop allowed. Filter efficiency tests to demonstrate 99% DOP removal by HEPA filters are provided and these tests are adequate, but the tests of charcoal adsorber banks to 97% removal as specified in the existing Technical Specifications do not ensure that excessive leakage does not exist. Charcoal samples are removed each 5 years and laboratory tested to demonstrate continued absorption capability. Not specified in the existing Technical Specifications are test conditions such as flow rate, flow distribution, or moisture removal.

We feel that changes are in order to bring the Kewaunee Technical Specification on filter systems up to a level which will insure that the performance of the systems will meet that taken credit for in the Safety Evaluation Report.

The changes to the Limiting Conditions for Operation are:

(1) A requirement to place the reactor in a shutdown condition within 12 hours in the event both circuits of the SBVS and ABVS are not operable.

(2) An upgrading of halogenated hydrocarbon removal from 97% to 99% to insure reduced leakage past the filters.

(3) A requirement to demonstrate design flow rates to within ±10%.

(4) A specification of >90% methyl iodine removal for the laboratory carbon sample analysis.

The changes to Surveillance Requirements are:

(1) The testing interval is changed to once per operating cycle, or once every 18 months, whichever occurs first for the charcoal absorber laboratory tests.

(2) The pressure drop across the combined HEPA filters and charcoal adsorbers will be specified to be less than six inches of water at the system design flow rate.

(3) Air distribution across the filters will be specified to be uniform within 20%.

(4) Automatic initiation of each branch of each system will be demonstrated.

(5) Heaters will be tested for operability in accordance with ANSI N510-1975.

(6) Cold DOP testing and halogenated hydrocarbon testing will be performed after replacement of the filters or after maintenance on the system housing.

(7) Each circuit will be operated with the heaters on at least 10 hours every month.

B. Spent Fuel Pool Sweep System

The spent fuel pool sweep system is required by the existing Technical Specifications to be operable during fuel handling. No explicit provision is made to require that the charcoal adsorber be in service during fuel handling. The charcoal adsorber is normally bypassed. Also, no provision is made to halt fuel handling in the event that the sweep system becomes inoperable.

The provisions in the existing Technical Specifications for testing and surveillance of this filter system are the same as those specified in A above for the SBVS and ABSVS. The same changes will be made for testing and surveillance of this system except that heater operability is not required since there are no heaters in the system and there is no need to operate the system periodically since operability must be demonstrated prior to fuel handling.

III. Evaluation

The HEPA filters for the various emergency air treatment systems are required to have removal efficiencies of greater than or equal to 99 percent DOP removal to demonstrate capability of the filters to remove at least 90 percent of the particulate activity produced from the postulated accidents as assumed in our accident analysis. The requirement for greater than or equal to 99 percent halogenated hydrocarbon removal by the charcoal adsorbers demonstrates that the charcoal bed is intact and does not have excessive leakage paths through the bed.

The laboratory results from carbon sample analysis for radioactive methyl iodide removal efficiencies under simulated accident conditions are required to be at least equal to those efficiencies assumed in our accident analysis. If the results from the carbon sample analysis under prescribed test conditions demonstrate a methyl iodide removal efficiency of at least 90 percent, it can be conservatively assumed that the charcoal adsorber in the emergency air treatment system from which the sample was taken would remove at least 90 percent of the inorganic iodine and 70 percent of the organic iodine. The use of the radioactive methyl iodide (organic iodine) in the test media assures that the charcoal has the capability to remove elemental (inorganic) iodine under postulated accident conditions with an efficiency equal to or greater than that measured under test conditions. The use of 95 percent humidity in the test of charcoal from those systems without heaters to control relative humidity of the air entering the charcoal adsorbers will assure that the removal of organic iodines will be equal to or greater than 70 percent when the test results demonstrate 90% removal. The margin between the measured test results and assumed removal efficiencies discussed above provide for possible degradation of the charcoal between the periodic tests.

The SBVS and the ABSVS have two independent and separate filter systems. The requirement that one of the two circuits of the ventilation systems may be inoperable for only seven days is based on the condition that the system is required to operate immediately following the postulated accidents. The only action that can be taken to mitigate the consequences of the postulated fuel handling accident if the spent fuel pool sweep system becomes inoperable is to terminate the fuel handling operations until the system is returned to service. The bases for the proposed requirements further discuss design aspects of these filter systems.

Demonstration that the filter system has not become clogged with foreign material will be required by determining the pressure drop across the filter banks and a uniform air distribution across the face of the filter banks on a periodic basis consistent with the reactor operating cycle. The stated frequency of tests and sample analysis is required to demonstrate conformance with the requirements that are consistent with operating time of the filter system or reactor operating cycles. The testing time periods for in-place testing are dependent upon the maintenance or filter replacements that have occurred between tests. Each of the SBVS circuits and the ABSVS circuits is required to be operated for ten hours per month to ensure operability and to remove excess moisture that may occur during standby of the system, The spent fuel sweep system has no heaters; therefore, no humidity controls are specified. Operability is demonstrated when the system is operating before fuel handling begins.

IV. Conclusions

Based on the considerations discussed above, we have concluded that the additional surveillance and testing of the installed filter systems at Kewaunee is required to ensure reliable and efficient operation of these systems under accident conditions to protect the health and safety of the public.

Date: DEC 29 1975

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SURNAME ➤						
DATE ➤						