NRC FORM 195 (2-76)

U.S. NUCLEAR REGULATORY COMMISSION

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

DOCKET NUMBER: 50-305

FILE NUMBER:

TO: Mr Rusche

FROM: Wisconsin Public Service Co
Green Bay, Wis
E W James

DATE OF DOCUMENT: 10-22-76

DATE RECEIVED: 10-26-76

☒ LETTER ☒ NOTORIZED
☒ ORIGINAL ☒ UNCLASSIFIED
☐ COPY

PROP

INPUT FORM

NUMBER OF COPIES RECEIVED: 3 signed

DESCRIPTION

Ltr notarized 10-22-76....trans the following:

PLANT NAME: Kewaunee

ENCLOSURE

Proposed Amdt #21 to the OL/Change #28 to the Enviro Tech Specs: Consisting of revisions with regard to eliminate certain special studies.....(40 cys encl rec'd)

ACKNOWLEDGED

DO NOT REMOVE

FOR ACTION/INFORMATION ENVIRO 10-27-76 ehf

SAFETY		ENVIRO	
ASSIGNED AD:		ASSIGNED AD:	
✓ BRANCH CHIEF:	Schwencer (5)	BRANCH CHIEF:	
✓ PROJECT MANAGER:	Neisbors	PROJECT MANAGER:	
✓ LIC. ASST.:	Sheppard	LIC. ASST.:	

INTERNAL DISTRIBUTION

✓ REG FILE	SYSTEMS SAFETY	PLANT SYSTEMS	SITE SAFETY &
✓ NRC PDR	HEINEMAN	TEDESCO	ENVIRO ANALYSIS
✓ I & E (2)	SCHROEDER	BENAROYA	DENTON & MULLER
✓ OELD		LAINAS	
✓ GOSSICK & STAFF	ENGINEERING	IPPOLITO	ENVIRO TECH
MIPC	MACCARRY	KIRKWOOD	ERNST
CASE	KNIGHT		BALLARD
HANAUER	SIHWEIL	OPERATING REACTORS	SPANGLER
HARLESS	PAWLICKI	STELLO	
			SITE TECH.
PROJECT MANAGEMENT	REACTOR SAFETY	OPERATING TECH.	GAMMILL
BOYD	ROSS	✓ EISENHUT	STEPP
P. COLLINS	NOVAK	✓ SHAO	HULMAN
HOUSTON	ROSZTOCZY	✓ BAER	
PETERSON	CHECK	✓ BUTLER	SITE ANALYSIS
MELTZ		✓ GRIMES	VOLLMER
HELTEMES	AT & I	✓ McGough	BUNCH
SKOVHOLT	SALTZMAN		✓ J. COLLINS
	RUTBERG		KREGER

EXTERNAL DISTRIBUTION

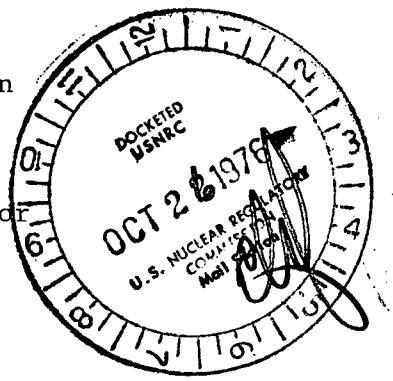
✓ LPDR: Kewaunee, Wi	NAT LAB:	BROOKHAVEN NAT LAB	CONTROL NUMBER
✓ TIC:	REG. VIE	ULRIKSON(ORNL)	
✓ NSIC:	LA PDR		
ASLB:	CONSULTANTS		
✓ ACRS 16 CYS ~~HOLDING~~ SENT To LA Sheppard			10795

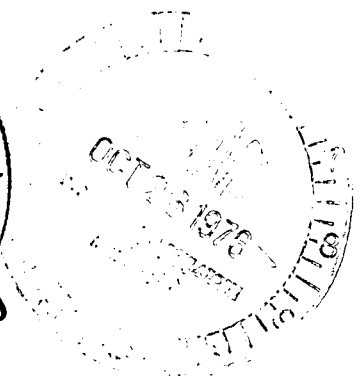
NRC FORM 196 (2-76)

WISCONSIN PUBLIC SERVICE CORPORATION

P.O. Box 1200, Green Bay, Wisconsin 54305

October 22, 1976





Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

ATTN: Mr. Benard C. Rusche, Director
Directorate of Licensing

Gentlemen:

REF: Docket 50-305
Operating License DPR-43

We submit herewith, forty (40) copies of Proposed Amendment No. 21, Change No. 23, to the Kewaunee Plant Environmental Technical Specifications. New page ES 4.1-1 (Proposed Amendment No. 21) replaces existing pages ES 4.1-1 through ES 4.1-6, ES 4.2-1, ES 4.2-2 and ES 4.2-3.

The proposed change is requested to eliminate certain special studies that are unnecessary based on data and analyses as determined by the 316(a) demonstration for the Kewaunee Plant and resultant adjudicatory hearing decision.

A general ecological survey was undertaken to evaluate the contribution of the plant discharges including possible long term effects on the biotic stresses in the lake.

The specific aims of the general survey were as follows:

1. Identify certain physical characteristics; such as water temperature, local lake currents, and bottom contours in the immediate plant influence.

2. Investigate benthic macro-invertebrates, zooplankton, phytoplankton, and periphyton populations and their distribution within the area of the thermal plume, intake, and in nearby control areas.

3. Characterize the distribution of fish at different seasons in the vicinity of the intake and discharge.

4. Determine whether the warm water discharge of water is having an adverse impact on the life history of fish in the vicinity of the plant.

5. Determine changes in the bacteriological and chemical makeup of the Lake Michigan waters in the vicinity of the plant.

6. Determine a numerical predictive model for the thermal plume and measure the shape and extent of the thermal plume during plant operations.

In addition to the above, other special studies were carried out and these are as follows:

1. Determine the effects of condenser passage and entrainment on phytoplankton.

2. Determine the effects of condenser passage and entrainment on zooplankton.

3. Determine the amount of shoreline erosion in the vicinity of the plant.

The above listed special studies and general survey were carried out in excess of the two year requirement stipulated in Section 4.1.1 of the Environmental Technical Specifications Appendix B.

Annual reports were submitted to the Nuclear Regulatory Commission which presented the results of these studies. Contained in these reports were the findings that the operation of Kewaunee Nuclear Power Plant was causing no appreciable harm to the aquatic environment.

Concurrent with the conductance of the general survey and other special studies, a 316(a) Demonstration, Type I: Absence of Prior Appreciable Harm, was performed in accordance with Public Law 92-500, the Federal Water Pollution Control Act Amendments of 1972, Section 316(a); and in accordance with Wisconsin Statutes Chapter 147, Sections 147.021, 147.05(4)(a), and 147.05(4)(b).

The overall findings of this demonstration are as follows (page 38 316(a) Demonstration):

Since the study results indicate that no harm has resulted to the aquatic biota (some potential benefits have been found and all alterations to the aquatic biota were found to be insignificant), it is concluded that the thermal component of the plant discharge has not disturbed the balanced indigenous communities of fish, shellfish and wildlife in Lake Michigan.

On August 10, 1976, an adjudicatory hearing was conducted by the State of Wisconsin, Department of Natural Resources with respect to the 316(a) demonstration and the Petition of Wisconsin Public Service Corporation for the Imposition of Alternate Effluent Limitations and Thermal Mixing Zone Requirements for the Kewaunee Nuclear Power Plant, Town of Carlton, Kewaunee County - EX-76-143.

The findings of fact were published in a letter from Maurice H. VanSusteren, Hearing Examiner, State of Wisconsin, Department of Natural Resources, and are contained in attachment 1.

The overall findings are summarized in fact 13, page 4, attachment 1, which states:

> "The Department (of Natural Resources) finds that no appreciable harm has resulted from the thermal component of the discharge, taking into account the interaction of such component with other pollutants and the additive effect of other thermal discharges, to a balanced, indigenous community of shellfish, fish and wildlife in and on the receiving water of Lake Michigan."

In addition to the above, Wisconsin Public Service Corporation has developed a numerical predictive model for the thermal plume and the erosion studies have been carried to a point to determine that "No unusual or unexpected erosion was noted that could be attributed to the operation of Kewaunee Nuclear Power Plant, either at the present time or by comparing operational photographs with those taken during the preoperational period." (Fifth Annual Report - Physical Studies, page 5)

Based on the preceding, the attached revised Environmental Technical Specifications are submitted.

It is suggested that a meeting be held between members of the Nuclear Regulatory Commission and Wisconsin Public Service Corporation to review the requirements for this change in the Environmental Technical Specifications such that this amendment can be issued expediously. To meet this need a member of our staff will contact the Environmental Projects Branch in the near future.

Very truly yours,

E. W. James
Senior Vice President
Power Supply & Engineering

EWJ:sna
Enc.

Subscribed and Sworn to
Before Me This 22ND Day
of OCTOBER 1976

Jerome O'Leary
Notary Public, State of Wisconsin

My Commission Expires
February 14, 1979

BEFORE THE

DEPARTMENT OF NATURAL RESOURCES

Petition of Wisconsin Public Service Corporation for the Imposition of Alternative Effluent Limitations and Thermal Mixing Zone Requirements for the Kewaunee Nuclear Power Plant, Town of Carlton, Kewaunee County	)	EX-76-143 WI-0001571

FINDINGS OF FACT, CONCLUSION OF LAW AND ORDER

In May of 1976 the Wisconsin Public Service Corporation for and on behalf of itself as the manager and for Wisconsin Power and Light Company and Madison Gas and Electric Company as co-owners filed a petition with the Department of Natural Resources for a public adjudicatory hearing pursuant to Sections 147.05(4)(a) and 147.20, Wisconsin Statutes, and Wisconsin Administrative Code NR 209.05 and 102.07 for the imposition of alternative effluent limitations and thermal mixing zone requirements for the Kewaunee Nuclear Power Plant in the Town of Carlton, Kewaunee County.

The petitioner is required by Wisconsin Administrative Code NR 102.05 to control the thermal component of its discharge to Lake Michigan such that by July 1, 1979 the thermal discharge shall not raise the temperature of the receiving water more than 3° F above the existing natural temperature at the edge of a mixing zone nor raise the temperature at the edge of the mixing zone above the maximum temperature limits as set out in the Administrative Code. The thermal mixing zone is as defined in Wisconsin Administrative Code NR 102.05.

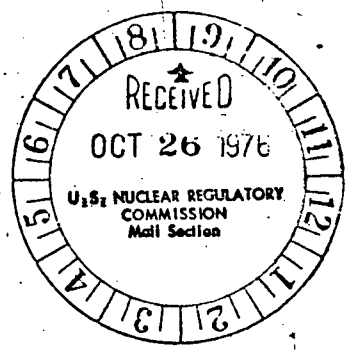
In addition to the foregoing thermal discharge and mixing requirements the petitioner is required by Section 147.04, Wisconsin Statutes, and Wisconsin Administrative Code NR 290.11 to control the thermal component of its discharge such that by July 1, 1981 there shall be no discharge of heat from the main condensers except blowdown from recirculated cooling water systems provided that the temperature of the blowdown does not exceed at any time the lowest temperature of the recirculated cooling water prior to the addition of the make-up water.

The petitioner requests that the thermal component of its discharge be exempted from the thermal mixing zone requirements of NR 102.05 and further that it be subjected to the following alternative effluent limitations in lieu of that required by Wisconsin Administrative Code NR 290.11:

> "The thermal discharge from the plant shall not have a flow rate of more than 450,000 gallons per minute nor have a temperature increase between the intake and discharge of more than 30° F."

The petitioner submitted a demonstration pursuant to Wisconsin Administrative Code NR 209.03(2)(a) and 102.06 in support of the petition.

Public hearing was held August 10, 1976 at Kewaunee, Wisconsin before Examiner Maurice H. Van Susteren.



APPEARANCES:

IN SUPPORT:

Wisconsin Public Service Corporation, by

Allen W. Williams, Jr., Attorney
Milwaukee

AS INTEREST MAY APPEAR:

Brown County Conservation Alliance, by

Kenneth Euers, President
Green Bay

The Lake Michigan Federation, by

Thomas D. Eisele, Deputy Director
Chicago, Illinois

Department of Natural Resources
Division of Environmental Standards, by

Robert J. Mussallem, Attorney
Madison

CDM/Limnetics, by

Daniel F. Buss, Program Manager - Point Beach Nuclear Plant
Milwaukee

Bill Rudolph, President
Milwaukee

Wisconsin Electric Power Company, by

Charles H. Wahtola
Milwaukee

FINDINGS OF FACT

1. The Kewaunee Nuclear Power Plant, Town of Carlton, Kewaunee County operated by the Wisconsin Public Service Corporation has a pressurized water reactor licensed at 1650 M Wt and a turbine generator of 540 M We. The unit began full commercial operation in 1974 and reached full power in August 1974.

2. The plant uses a once through cooling system with a normal flow rate of 413,000 gpm with a design maximum rise in temperature of 11.1° C. The intake structure is located approximately 1600 feet offshore and cooling water is discharged from a shoreline outfall structure.

3. Lake currents at the plant parallel the shore in the direction N NE - NE and S SW - SW with speeds most frequently in the range of 0.10-0.24 fps. The direction of net displacement of water past the plant for the period April-December 1973 and June to October 1974 was northward. Maximum and maximum mean temperatures of the lake near the plant in 1973-1974 occurred in August with maximum ranges occurring in August 1973 and July 1974. Stratification develops in the shallow nearshore area but breaks down easily.

4. The discharge zone for the plant thermal plume encompasses an area of approximately 985.3 acres at the surface and 94.5 acres at the bottom. The surface area is in excess of the 71.74 acres of the Department standard for the plant. The thermal plume discharge velocity affects an area of the lake bottom about 250 feet wide extending 400 feet from the outfall. There is a 55% to 90% reduction in excess temperature within 50 to 75 minutes travel time from the outfall.

5. The chemical quality of the water in the plant vicinity is representative of general lake conditions with no change in the major anions and cations. Water quality generally within and immediately outside the thermal plume is essentially the same considering dissolved oxygen, nitrogen species, orthophosphate and soluble silica concentrations. Alkalinity and pH were virtually constant but turbidities and suspended solids changed in relation to weather conditions. Bacteria levels, oxygen demands and trace metal values show little if any differences between preoperational and operational periods.

6. The Department chose 30 species of fish as representative important species and posed 18 questions as part of the demonstration. The list embraces fish considered to have other values such as commercial, community integrity, sport, forage and changing status.

Alewife, rainbow smelt, yellow perch, lake trout, lake chub, longnose dace, white sucker, longnose sucker and slimy sculpin are the major constituents of the local fishery comprising 98% of the total catch. Annual catches and general distribution of major species are unrelated to the thermal discharge of the plant.

The life history of the representative important species was studied to include general occurrence in Lake Michigan, seasonal migrations, seasonal abundance near the plant, spawning, growth and food habits.

Species believed to spawn successfully in areas near the plant are alewife, rainbow smelt, lake chub, longnose dace and slimy sculpin. Peak abundances of alewife, smelt, trout and white sucker appear to correspond to their respective spawning seasons but no spawning habitat was identified for the various species.

The area affected by the plant's thermal discharge is not an important spawning location for any species. The area has, however, developed an extensive seasonal salmonid fishery at the plant outfall.

The thermal discharge has had no appreciable influence on the local fishery. No major changes in species composition, seasonal abundance or spatial distribution of the representative important species has occurred since the plant began operating. The outfall, however, has attracted certain species namely, the carp. Attraction to the thermal discharge is in response to the higher temperatures but fish also avoid the discharge when temperatures become too high. The discharge at the outfall has only a negligible effect on the normal seasonal migrations of fish. No fish kills have occurred since the plant began operation.

The discharge of waste heat from the plant has caused no harm to the representative species in the discharge zone and has no effect on the representative species immediately outside the discharge zone.

7. Densities and seasonal distributions of macroinvertebrates have not changed by operation of the plant and the thermal discharge has had no effect on the macroinvertebrate community within the discharge zone.

8. The phytoplankton community has remained essentially unchanged from preoperational to operational periods. The plant operation has caused no harm to the phytoplankton community inside and outside the discharge zone.

9. The operation of the plant had no effect on zooplankton either inside or outside the discharge zone.

10. Periphytic algae collected in both preoperation and operation phases show little if any change in locations outside the discharge zone. Standing crop variations show a consistent seasonal trend. The larger standing crops, however, are found on either side of the discharge canal. The canal riprap erosion control walls provide a favorable substrate for algal colonization.

11. No macrophytes were observed in the vicinity of the plant in either the preoperational or operational phases.

12. An immediate primary benefit of plant operation is the development of an extensive salmonid fishery in the immediate discharge area.

13. The Department finds that no appreciable harm has resulted from the thermal component of the discharge, taking into account the interaction of such component with other pollutants and the additive effect of other thermal discharges, to a balanced, indigenous community of shellfish, fish and wildlife in and on the receiving water of Lake Michigan.

14. The thermal mixing zone requirements of Wisconsin Administrative Code NR 102 are more stringent than necessary to assure a balanced indigenous community of shellfish, fish and wildlife in Lake Michigan.

15. Discharge limitations of 450,000 gallons per minute and a temperature increase between intake and discharge of 30° F or less will assure the protection and propagation of balanced indigenous communities of fish, shellfish and wildlife in the vicinity of the Kewaunee Nuclear Power Plant in Lake Michigan.

CONCLUSION OF LAW

The Department of Natural Resources has the authority and power under Chapter 147, Wisconsin Statutes, and Wisconsin Administrative Code Chapters NR 102 and 209 and in accordance with the foregoing findings of fact to issue an order imposing alternative effluent limitations and to exempt the thermal component of the petitioners discharge from existing thermal mixing zone requirements of Wisconsin Administrative Code NR 102.05.

ORDER

THE DEPARTMENT, THEREFORE, ORDERS:

1. The petition of Wisconsin Public Service Corporation for the imposition of alternative effluent limitations and exemption from thermal mixing zone requirements for the Kewaunee Nuclear Power Plant be, and the same is hereby granted.

2. The petitioner is exempted from the thermal mixing zone requirements of Wisconsin Administrative Code NR 102.05 and is subjected to the following alternative effluent limitations in lieu of that required by Wisconsin Administrative Code NR 290.11:

The thermal discharge from the plant shall not have a flow rate of more than 450,000 gallons per minute nor have a temperature increase between the intake and discharge of more than 30° F.

Dated at Madison, Wisconsin, this 13th day of September, 1976.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES
For the Secretary

By Maurice H. Van Susteren
Maurice H. Van Susteren
Hearing Examiner

4.1 Biological

4.1.1 Aquatic

Objective: To determine the effects of impingement of fish on the traveling screens.

Specification: Impingement studies shall continue for two years. A summary of the progress and results of these studies shall be reported in accordance with Plant Reporting Requirements. Data collected during the two years of the program shall be evaluated by the licensee and the NRC to determine whether the program should be discontinued.

1. Fish Impingement
   The number, size and weight of all individual fish collected in a 24 hour period in the circulating cooling water trash basket shall be identified and quantified by plant personnel a minimum of twice per week during circulating water pump operation. An inspection of the trash basket shall be made at least once per shift. If the number of a particular species of fish captured in the trash basket exceeds 50, the average size and weight and an estimate of the total number shall be determined from a subsample of approximately 10% of the impinged species. No subsamples shall be taken when the number of a particular species of fish is 50 or less.

4.2.2 De-icing Operation

Objective: To document periods of de-icing the circulating water intake structure.

Specification: Periods of de-icing operation and inlet temperatures of the incoming water shall be recorded on an hourly basis and documented in the Annual Environmental Operating Report.

Bases: De-icing operations will occur when the intake waters approach the freezing point or when off-shore winds carry slush over the intakes. During these periods, approximately 3000 gpm of water will be sprayed over the intake cones. An additional 15,000 gpm and 10,000 gpm, depending on two or one pump operation, will be continuously added to the forebay by gravity feed from the discharge structure.