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SUBJECT: Forwards 1986 revs to updated FSAR for Kewaunee Nuclear Plant. Two mods included re seismic monitoring & addition of capacitor banks to 345 kV substation bus.

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July 1, 1986

Dr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Updated Safety Analysis Report

Pursuant to 10 CFR 50.71(e), you will find enclosed the 1986 update of the Updated Safety Analysis Report (USAR) for the Kewaunee Nuclear Power Plant (KNPP).

Attachment 1 includes a description of the revisions with appropriate safety analyses, and Attachment 2 contains the affected pages.

Two plant modifications made under the provisions of 10 CFR 50.59, which have not been previously submitted to the Commission, are included with the USAR update. These are the Seismic Monitoring system modification, USAR page 1.6-14, and the modification which added capacitor banks to a 345 KV substation bus, USAR page 8.2-2. These modifications will be included in the 1986 KNPP Annual Operating Report, WPSC's normal method of reporting 10 CFR 50.59 modifications.

This USAR revision accurately presents the completed modifications and analyses performed in support of continuing safe plant operation.

Sincerely,

Carl W. Giesler

Carl W. Giesler
Vice President - Power Production

GWH/jms
Enc.
cc - Mr. Robert Nelson, US NRC
Mr. J. G. Keppler, US NRC-Region III
Mr. G. E. Lear, US NRC (w/o attach.)

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ATTACHMENT 1

DESCRIPTION OF CHANGES & SAFETY EVALUATIONS

1986 USAR REVISION

JULY 1, 1986

Typographical errors were corrected on the following pages:

3-iv
5.2-65
5.3-1
5.4-10
6.1-8
6.2-1
8.2-9
9.3-22 (Top of Page)

The following drawings have been revised due to the completion of plant design changes or minor drawing discrepancies:

Section 1

Figure 1.1-1
1.2-1
1.2-2
1.2-4
1.2-6
1.2-7
1.2-10
1.2-11

Section 4

Figure 4.2-1
Figure 4.2-2

Section 5

Figure 5.4-1

Section 6

Figure 6.2-1

Section 8

Figure 8.2-3

Section 9

Figure 9.2-2
9.2-3
9.2-4
9.2-5
9.3-2
9.6-1
9.6-2
9.6-3
9.6-4
9.6-5

Section 10

Figure 10.2-1
10.2-2
10.2-3
10.2-4
10.2-7
10.2-8
10.2-9
10A.3-2
10A.3-3
10A.3-6
10A.3-7
10A.3-8
10A.4-2
10A.4-3
10A.4-5
10A.4-6
10A.4-7
10A.4-8
10A.5-2
10A.6-2

Section 11

Figure 11.1-3A
11.1-4
11.2-1
11.2-2
11.2-3
11.2-4

The following pages have been revised to reflect technical changes to the content of the USAR:

Page I-V

Description of Change

The list of figures for section 1 of the USAR has been revised to identify the drawing indicating the location of the Technical Support Center.

Safety Evaluation

This change is administrative as the TSC, as an event response facility, has been operational since 1981.

Page 1.2-8

Description of Change

The descriptions for the Control Room Air Ventilation System and the Technical Support Center (TSC) diesel generator have been removed from the discussion of Engineered Safety Features (ESF).

Safety Evaluation

Neither the Control Room Air Ventilation System, or the TSC diesel generator are ESF systems or components. This change is not the result of a facility modification, it is an administrative correction.

Section 6.0 of the USAR states:

> "The central safety objective in reactor design and operation is control of reactor fission products. The methods used to assure this objective are:
>
> a. Core design to preclude release of fission products from the fuel (Section 3).
>
> b. Retention of fission products by the reactor coolant system boundary for whatever leakage occurs (Section 4 and 6).
>
> c. Retention of fission products by the containment for operational and accidental releases beyond the reactor coolant boundary (Sections 5, 6 and 9).
>
> d. Limit fission product release to minimize population exposure. (Sections 2 and 11).
>
> The Engineered Safety Features are the provisions in the plant which implement methods b and c (above) to prevent the occurrence or to minimize the effects of serious accidents.

The Engineered Safety Features in this plant are the Containment System, detailed in Section 5; the Safety Injection System, detailed in Section 6.2; the Containment Cooling System, detailed in Section 6.3; the Containment Spray System, described in Section 6.4; the Auxiliary Feedwater System, described in Section 6.6; Special Zone Ventilation Systems, described in Sections 5 and 9.6; and the Diesel Generators and Station Batteries, described in Section 8."

Apparently, an inconsistency exists in the USAR, Section 1.2.8 entitled, "Engineered Safety Features", which includes a summary of the ESF systems. Included in Section 1.2.8 are the Control Room Ventilation System (Item f.3) and the Technical Support Center Diesel (Item g). Since neither of these systems are utilized to provide retention of fission products by the RCS or the containment, these systems should not be considered as ESF, and there are no adverse safety implications with removing their descriptions from Section 1.2.8.

Page 1.6-14 & Page 1.6-15

Description of Change

These pages of the USAR were updated to reflect modifications to the seismic monitoring system at the Kewaunee Nuclear Power Plant.

Safety Evaluation

The seismic monitoring system was replaced, in part, because it was obsolete in regards to data interpretation and spare parts. The new system is digital, eliminating analog drifts, and its output is more readily interpreted.

This modification is considered an upgrade to the seismic monitoring capability at the KNPP, and as a result, earthquake data acquisition is enhanced. There is no effect on plant safety as the seismic monitor only collects data.

Page 2.7-1

Description of Change

The KNPP USAR meteorological program description has been updated to indicate hardware and program modifications that were necessary to comply with the NRC criteria for emergency preparedness, primarily discussed in NUREG 0654.

Safety Evaluation

The meteorological data acquisition capability was upgraded at the Kewaunee Nuclear Plant, along the guidelines for emergency preparedness proposed by the NRC, primarily in NUREG 0654 and later in Supplement 1 to NUREG 0737. (Also discussed in Regulatory Guides 1.23 and 1.97.)

During the period of September 23-28, 1984 the NRC conducted an appraisal of the Emergency Response Facilities (ERF's) at the Kewaunee Nuclear Plant. The objective of this appraisal was to determine whether the ERF's are capable of supporting those licensee functions necessary to determine adequate protective measures in the event of a radiological emergency. Also, to assure the requirements in Supplement 1 to NUREG 0737 were satisfied.

The meteorological data acquisition system was reviewed as part of the Information Management Appraisal (reference: C. J. Paperiello (NRC) to D. C. Hintz (WPS) Dated December 19, 1984), and the NRC concluded that the upgraded meteorological data acquisition system meets the requirements of Supplement 1 to NUREG 0737.

Page 2.8-1

Description of Change

The 'Environmental Radioactivity Program' description in the USAR has been updated to include a reference to Kewaunee's present radioactive effluent surveillance program.

Safety Evaluation

The radiological effluent surveillance program used at the KNPP was incorporated in Kewaunee's Technical Specifications on January 1, 1986, and is consistent with 10CFR50 Appendix I. The Appendix I radiological effluent surveillance program is an upgrade from Kewaunee's previous radiological effluent surveillance program, as noted by the NRC in their safety evaluation dated July 29, 1985. The impact of plant operation on the health and safety of the public will be predicted with greater certainty, enhancing the awareness of the level of safety associated with radiological effluents from the KNPP.

Table 3.2.7

Description of Change

The data representing the Initial Core Mechanical Design Parameters have been revised to correct two errors.

Safety Evaluation

There is no safety concern as the previous numbers were erroneously transcribed from the initial Westinghouse analyses contained in W 271C061.

Page 4.2-3 and 4.2-8

Description of Change

The descriptions of the reactor and pressurizer have been revised to include the high point vents, a post-TMI modification.

Safety Evaluation

Addition of RCS high point vents was required by the revision to 10CFR50.44, specifically paragraph 50.44 (C)(3)(iii). Installation of the high point vents at the Kewaunee Nuclear Plant is consistent with the rule, and will provide an additional means to vent uncondensible gases should the need arise. As a result operational flexibility is increased with a positive effect on overall safety. Reference NRC Safety Evaluation; S. A. Varga (NRC) to C. W. Giesler (WPSC), NUREG 0737 Item II.B.1 Reactor Coolant System Vents Kewaunee Nuclear Power Plant, September 1, 1983.

Page 4.2-17

Description of Change

The USAR discussion of the pressurizer relief tank has been revised to delete the discussion of backpressure at the safety valves, following their actuation, caused by the flow resistance in the line connecting the pressurizer safety valves to the pressurizer relief tank (PRT).

Safety Evaluation

Safety valve actuation was shown to result in stresses in the safety valve discharge piping in excess of the allowed stresses. As a result, the pressurizer discharge piping was modified and rupture discs were installed, with the intent that pressurizer safety valve actuation will rupture the rupture discs and safety valve discharge will be to the pressurizer vault, rather than the pressurizer relief tank (PRT). Hence, the discussion of resultant backpressure from safety valve actuation, as a result of the flow limiting characteristics of the line connecting the safeties and PRT, is no longer applicable. Although safety valve discharge is no longer routed to the PRT, the piping connecting the pressurizer and PRT remains in place.

Page 4.2-18

Description of Change

The USAR discussion of the piping associated with the pressurizer has been revised to include a discussion of the modification to the pressurizer safety valve discharge line. The modification to the pressurizer safety valve discharge piping is intended to mitigate the forces associated with the pressurizer safety valve loop seal water slug accelerating as a result of safety valve actuation.

Safety Evaluation

Prior to implementing this modification a pressurizer safety valve actuation would have accelerated the loop seal water slug with resulting forces exceeding those allowed by Appendix B to the KNPP USAR. This modification assures any forces, resulting from safety valve actuation, in the pressurizer safety valve discharge piping will be below those allowed in Appendix B to the KNPP USAR. Consistency with original design criteria is assured, providing the level of safety originally intended for KNPP operation.

Page 5.5-1

Description of Change

The USAR Shield Building Ventilation System (SBV) design description was revised to indicate that the SBV system is used for surveillance testing during normal plant operation.

Safety Evaluation

Periodic testing of the SBV system is required by the KNPP Technical Specifications. This testing includes running the SBV system. Possible radiological discharges are monitored while testing the SBV system with the plant at power. Should a safety injection signal be initiated during a test, the SBV system would shutdown and restart in its assigned safety injection sequence. There are no adverse safety consequences with testing the SBV system with the plant at power.

Page 6.6-3

Description of Change

The Auxiliary Feedwater System Design and Operation discussion was revised to clarify that no single 'active' failure will prevent more than one Auxiliary Feedwater Pump from starting.

Safety Analysis

This revision is consistent with the Engineered Safety Features Performance Capability criterion discussed on KNPP USAR page 6.1-6. As noted, "... (all ESF systems) shall provide sufficient performance capability to accomodate the failure of any single active component without resulting in undue risk to the health and safety of the public." This revision is intended for clarification purposes; there are no safety consequences.

Page 8.2-2 and Figure 8.2-1

Description of Change

The Electrical System Network Interconnection description was revised to include a description of the modification which added four capacitor banks to the west 138KV bus in the substation.

Safety Analysis

Adding these capacitor banks will decrease the probability of having a low voltage on the west 138KV bus, which could cause actuation of the safeguard bus second level undervoltage relays, and transfer of the buses to their diesel generators after the time delay associated with second level undervoltage protection. Therefore, the probability of an operational transient occurring as a result of a low voltage condition is reduced, enhancing overall plant safety.

Page 8.2-11 and Table 8.2-2 (Sheets 1 & 2 of 2)

Description of Change

The USAR description of the 120 Vac instrument bus leads has been revised to indicate replacement of the Prodac 250 (P250) computer with the Honeywell Plant Process Control System (PPCS) computer. Additionally, where the P250 once received its power through inverter BRA-110, the PPCS receives its power through inverter BRC-108.

Table 8.2-2 was revised to indicate that the PPCS is powered from Safeguards B power, whereas the P250 was powered from Safeguards A power.

Safety Analysis

This revision is necessary because the P250 plant process computer was replaced with a Honeywell PPCS computer. The replacement of computers is an upgrade in plant diagnostic and support capabilities, as a result there is a positive affect on plant safety.

The power supply to the PPCS is from inverter BRC108 which receives power from 480 Vac MCC 1-62C (normal), 120/208 Vac cabinet BRB-105 (alternate), and 125 Vdc cabinet BRB-102 (standby). The previous power supply to the P250 was through inverter BRA-110 which receives its power from 480 Vac MCC 1-52C (normal), 120/208 Vac cabinet BRA 105 (alternate), and 125 Vdc cabinet BRA-103 (standby). The redundancy in power supplies remains the same and an evaluation of switching the power supplies from Safeguards A to Safeguards B power was performed and found acceptable.

Page 8.2-23

Description of Change

The diesel generator starting sequence was revised to more clearly explain the diesel generator air start motor logic.

Safety Evaluation

There are no safety consequences as the diesel generator air start motor logic remains unchanged, although its USAR description has been clarified.

Page 8.2-37 and Table 8.2-1 (Pages 2 of 3 and 3 of 3)

Description of Change

Table 8.2-1 Diesel Generator Loads for Design Basis Accident (DBA), has been revised to reflect plant modifications made to upgrade the post DBA Zone SV, and turbine building class I aisle ambient cooling capability. Existing fan coil units were upgraded by increasing fan motor speed and replacing the cooling coils with coils designed for a larger cooling capacity. Also, several additional fan coil units were added. Increasing motor speeds and adding new cooling unit fan loads to the safeguards buses will increase the total diesel generator load in the event of a safety injection signal coincident with a loss of off-site power. Page 8.2-37 lists the total loads itemized in Table 8.2-1.

Safety Evaluation

The HVAC modifications provide added assurance that post DBA ambient temperatures will remain below 104°F, and the additional diesel generator loads result in total load below the diesel generator's rating; therefore, there are no negative safety implications.

Page 9.2-37

Description of Change

The Monitor Tank description has been revised to reflect the plant modification which removed the diaphragm membranes to allow a more rapid pressure equilibration when discharging the tank.

Safety Evaluation

All condensate in the monitor tanks is discharged to Lake Michigan. The purpose of the diaphragms was to prevent air from being absorbed in the water stored in the monitor tanks. Because the monitor tanks are discharged, and the contents are not sent to the reactor makeup system, dissolved air is not a problem and there are no safety implications with removing the diaphragms.

Page 9.3-22

Description of Change

The Incident Control portion of the Residual Heat Removal description was revised to reflect plant modifications that were made to provide added protection against a low temperature over pressure (LTOP) event.

Safety Evaluation

The LTOP modification included: (1) Removing the automatic closure at 700 psig from the RHR hot leg suction valves RHR 1A, 1B, 2A and 2B; (2) Adding interlocks to close RHR 1A and 2A simultaneously on actuation of either valve's control switch (this same feature was also added for RHR 1B and 2B); and (3) Changing the RHR Improper Lineup annunciator setpoint from 700 to 500 psig. These changes will increase the level of protection against a LTOP event, thereby increasing plant operational safety. Reference NRC Safety Evaluation Reports, S. A. Varga (NRC) to C. W. Giesler (WPS), August 2, 1983; and S. A. Varga to D. C. Hintz, January 16, 1985.

Page 9.6-8

Description of Change

The USAR Service Water System Design Bases description was revised to include a short discussion of 2 fan coil cooling units that have been added in the KNPP containment building which use service water as their cooling media.

Safety Evaluation

These cooling units were added to lower the containment ambient temperature during normal plant operation. They are WPSC QA Type 1 which means they are constructed and installed with quality commensurate to nuclear safety related equipment. However, these cooling units are not engineered safety features, nor are they safeguard equipment; although their use does add to operational safety by lowering the containment ambient temperature.

Page 10.2-23

Description of Change

The Turbine Controls description has been revised to note that a dropped rod signal from the IRPI system does not result in a turbine automatic load limit and load reference runback.

Safety Evaluation

Rod drop protection was provided for early Westinghouse plants via a turbine runback and a block of automatic rod withdrawal. As analytical methods were improved it became apparent to Westinghouse that DNB protection from a single rod drop was inherent in core design([1]). As a result, Kewaunee's core reload design analyses verify that the DNB ratio remains greater than 1.3 for any single rod drop. The Kewaunee Nuclear Plant began commercial operation after Westinghouse concluded single rod drop protection was inherent in core design, and as a result the turbine runback/rod stop signal on a single dropped rod was never a feature of the reactor protection system (RPS).

There are no safety concerns with removing the USAR reference to the automatic turbine runback/rod stop signal upon indication of a dropped rod as 1) it never existed, and 2) core design is such that the minimum DNBR remains above 1.3 for any single dropped rod.

Page 11.1-9

Description of Change

The discussion of the Steam Generator Blowdown System has been revised to indicate that the temperature of the steam generator blowdown is 'approximately' 100°F rather than 100°F.

Safety Evaluation

This change is being made to accommodate plant operation during summer months, when condensate temperature may rise above 100°F making it impossible to cool steam generator blowdown below 100°F with condensate water. There are no safety consequences associated with this revision. Steam generator blowdown presently is discharged to Lake Michigan with the circulating water discharge. Blowdown flow, at approximately 80 gpm, is negligible compared to circulating water discharge flow, approximately 400,000 gpm.

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[1]) D. C. Richardson (Westinghouse) to E. R. Mathews (Wisconsin Public Service), Kewaunee Nuclear Power Plant High Nuclear Flux Rate Trip

Page 11.1-12 and Page 11.1-13

Description of Change

The Solids Processing section of the Waste Disposal System description has been revised to reflect a modification to the plant which allows transferring spent resin directly to a high integrity container (HIC) for dewatering, and subsequent storage and off-site burial.

Safety Evaluation

Dewatering spent resin in a HIC saves on personnel exposure and volume of waste shipped off-site when compared to solidification; thereby increasing plant personnel safety and decreasing the burden on burial facilities.

Page B.9-2

Description of Change

The Turbine Missile analysis has been updated to include reference to the revised safety analysis for turbine missile generation as a result of the plant modification to have three (3) interchangeable low pressure turbine spindles.

Safety Evaluation

As Westinghouse notes in their safety evaluation (reference 12 on USAR page B.9-4) the probability for disc separation from stress corrosion cracking is lower with the new disc design, complemented by the Westinghouse inspection criteria; therefore, this modification increases plant safety.