



JUN 04 2007

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Serial No. 07-0373  
KPS/LIC/MH: RO  
Docket No. 50-305  
License No. DPR-43

**DOMINION ENERGY KEWAUNEE, INC.**  
**KEWAUNEE POWER STATION**  
**SUMMARY OF FACILITY CHANGES, TESTS AND EXPERIMENTS AND SUMMARY**  
**OF COMMITMENT CHANGES**

Pursuant to 10CFR 50.59(d)(2), enclosed is a summary description of Facility Changes, Tests and Experiments evaluated in accordance with 10 CFR 50.59(c) and implemented at the Kewaunee Power Station during the last reporting period, which is defined as not to exceed 24 months.

A commitment change evaluation summary for those commitment changes that occurred during the last reporting period is also enclosed.

The enclosed summary encompasses all changes that occurred in both of the stated areas since our prior submittal of this information on June 3, 2005.

If you have questions or require additional information, please feel free to contact Ms. Mary Jo Haese at 920-388-8277.

Very truly yours,

Leslie N. Hartz  
Site Vice President, Kewaunee Power Station

Attachment

Commitments made by this letter: NONE

IE47  
NRR

cc: Regional Administrator, Region III  
U. S. Nuclear Regulatory Commission  
2443 Warrenville Road  
Suite 210  
Lisle, Illinois 60532-4352

NRC Senior Resident Inspector  
Kewaunee Power Station

**ATTACHMENT 1**

**SUMMARY OF FACILITY CHANGES, TESTS AND EXPERIMENTS AND SUMMARY  
OF COMMITMENT CHANGES**

**KEWAUNEE POWER STATION**

**DOMINION ENERGY KEWAUNEE, INC.**

### **10CFR50.59 Evaluation 05-04-00**

**Activity Evaluated:** Design Change Request (DCR) 3570 - Install check valves in the floor drain lines from the Cardox Room, Safeguards Alley, and the Bus 1 & 2 Room, to the Turbine Building sump, and install AC/DC sump pumps in the Safeguards Alley trench.

**Brief Description:** This DCR enhances the Miscellaneous Drains and Sump System by providing check valves in the floor drains in the Cardox Room, Bus 1 & 2 Room, and Safeguards Alley. The check valves prevent flow from the turbine building sump, through the trench and catch-basin drain lines, and into safeguards alley. Two AC/DC sump pumps were also installed in the safeguards alley trench. The sump pumps remove water from the trench and discharge to the turbine building sump.

**Reason for the Change:** This change was made to reduce the likelihood of damage to Class I systems and components located in safeguards alley by the postulated failure of pipes and tanks in the turbine building.

**Summary:** To reduce the likelihood of damage to Class I systems and components located in safeguards alley, the following steps were taken:

Check valves were installed in floor drain lines to preclude waters potentially introduced into the turbine building environs, by the rupture of tanks or pipes in that area, from flowing into safeguards alley via interconnecting floor drains.

Two AC/DC sump pumps were installed to provide a means for removing water from the safeguards alley trench, discharging the water into the turbine building sump.

### **10CFR50.59 Evaluation 05-05-00**

**Activity Evaluated:** Updated Safety Analysis Report (USAR) Change Request R19-045 – USAR Revision to Reflect Application of USNRC Generic Letter (GL) 87-11 Methodology.

**Brief Description:** This USAR revision reflects allowing Kewaunee's application of the Method of Evaluation described in USNRC GL 87-11, "Relaxation in Arbitrary Intermediate Pipe Rupture Requirements" for reanalyzing potential high energy line break locations.

**Reason for the Change:** The Kewaunee Power Station (KPS) staff identified a non-conformance in the as-built condition of the Condensate supply line to the Auxiliary Feedwater (AFW) pump suction and a Normal Feedwater (NFW) line. Specifically, the NFW line (which meets the definition of a High Energy Line) runs in close proximity to the Condensate supply line. The KPS licensing basis for postulating High Energy Line Breaks (HELBs) required postulating a break in the NFW line which could have disabled

the Condensate supply line to the AFW pump suction. Adoption of the NRC GL 87-11 methodology precluded the need to postulate the NFW line break of concern.

Summary: The adoption of the NRC GL 87-11 methodology for assessing the potential HELB in the subject NFW line allowed KPS to accept the non-conforming condition "as is" under the 10CFR50.59 process, consistent with 10CFR50 Appendix B.

#### **10CFR50.59 Evaluation 05-06-00**

Activity Evaluated: DCR 3581 - Main Circulating Water (CW) Pump Internal Flooding Trip.

Brief Description: The purpose of DCR 3581 was to provide a trip of both CW pump breakers whenever there is evidence of significant flooding in the Turbine Building (TB) basement that could impact operation of Class I equipment at or below the 586' elevation.

Reason for the Change: The KPS USAR requires that Class I equipment be adequately protected from the rupture of tanks and pipes. While considering the potential effects it became apparent that additional protection of Class I equipment located at or below the 586' elevation was warranted.

Summary: This design addressed concern for the potential flooding source from a CW Water Box expansion joint failure or CW pipe break. Based on this initiator, the source of flooding would be from the CW system. Tripping the CW pump breakers significantly reduces the likelihood of damage to Class I equipment resulting from the internal flood condition.

#### **10CFR50.59 Evaluation 05-07-00**

Activity Evaluated: Special Operating Procedure (SOP)-AFW-05B-20, AFW Pump 'B' Net Positive Suction Head (NPSH) Test.

Brief Description: SOP-AFW-05B-20 was developed to perform a one-time test to determine AFW pump NPSH requirements during pump operation with flowrates exceeding the original factory test conditions.

Reason for the Change: SOP-AFW-05B-20 was performed to gain additional information to be considered while improving the protection of KPS AFW Pumps against damage under pump runout conditions.

Summary: The procedure gathered data to identify Net Positive Suction Head Required (NPSHR) for the Auxiliary Feedwater pumps at higher flow rates than the original factory pump test. Pump performance data was gathered prior to the NPSHR test to determine baseline pump performance capabilities. The procedure followed accepted industry pump testing protocols. In the test the desired flow point was established by throttling a discharge valve, then the suction valve was carefully throttled until incipient

cavitation was indicated by a small reduction in discharge head. Upon indication of incipient cavitation, data was recorded. Following the completion of the NPSHR data gathering, pump performance, consistent with the baseline performance capability was verified. The "as-found" and "as-left" pump performance data demonstrated continued acceptable pump performance.

### **10CFR50.59 Evaluation 05-09-00**

**Activity Evaluated:** DCR3576, Rev. 3, Auxiliary Feedwater (AFW) Pump Protection Upgrades.

**Brief Description:** This activity improved AFW pump protection from low Net Positive Suction Head (NPSH) and runout conditions.

**Reason for the Change:** The purpose of this design change was to address the following design vulnerabilities of the AFW system:

1. The discharge pressure trips might not have protected the AFW pumps during all postulated loss of Condensate Storage Tank (CST) contents or a break in the non-safety related suction piping (caused by an earthquake or tornado).
2. The AFW pump discharge pressure trip feature might not have protected the AFW pumps from damage from air ingestion or pump cavitation under all postulated conditions.
3. AFW pump NPSH requirements may not have been fully addressed for all scenarios that involve a depressurized Steam Generator.

**Summary:** The scope of this modification included the following:

1. Reroute and resize a portion of the existing AFW pump suction piping from the CSTs to establish a protected, seismically qualified water volume.
2. Added suction instrumentation to detect the loss of the normal water supply (or NPSH) from the CSTs and initiate an AFW pump trip.
3. Modify the AFW pump discharge instrumentation to detect a runout condition of the AFW pumps and initiate a pump trip.

### **10CFR50.59 Evaluation 05-10-00**

**Activity Evaluated:** DCR 3578, Installation of Flood Barriers.

**Brief Description:** This modification installed numerous flood barriers to ensure that Class I equipment is appropriately protected against damage from the rupture of tanks or pipes.

**Reason for the Change:** The KPS USAR, Section B.5 requires that Class I equipment be appropriately protected against damage from the rupture of tanks or pipes. KPS determined that additional protection against the affects from the rupture of non-seismically analyzed piping and tanks was appropriate.

**Summary:** This modification installed defense-in-depth flood barriers that passively isolate flood waters in the Turbine Building basement, as necessary, to protect Class I equipment in adjacent areas. The barriers provide defense-in-depth protection at the following locations:

- At Door 4, Turbine Building to Safeguards Alley
- At Door 6, Turbine Building to Auxiliary Feedwater Pump room
- At Door 11, Turbine Building to Auxiliary Building
- At Door 15, Turbine Building to Auxiliary Building
- At Door 16, Turbine Building to Steam Generator Blowdown Heat Exchanger Room
- At Door 401, Turbine Building to Cardox Storage Tank room
- At the Turbine Driven Auxiliary Feed Pump room blowout panel

This modification also upgraded existing doors and installed defense-in-depth barriers that passively isolate floodwaters to ensure the following doors are not challenged:

- Door 12, Auxiliary Building Basement - Steam Exclusion Area Boundary Door
- Door 13, Auxiliary Building Basement - Steam Exclusion Area Boundary Door

#### **10CFR50.59 Evaluation 05-11-00**

**Activity Evaluated:** This 10CFR50.59 evaluation assessed two KPS calculations (05Q4515-CAL-001 and 05Q4515-CAL-002).

**Brief Description:** KPS calculations 05Q4515-CAL-001 and 05Q4515-CAL-002 were performed to qualify the as-built configuration of affected concrete masonry block walls.

**Reason for the Change:** KPS original design documents specify top restraints on both sides of the subject block walls. During a condition evaluation, KPS identified that some of the clips were not installed per the specifications. These calculations served as the seismic assessment of the affected block walls.

**Summary:** KPS performed the evaluations of the affected Concrete Masonry Block walls in the subject calculations. In these calculations, the as built conditions were modeled, and evaluated as acceptable. The calculations followed the methodology applied in an NRC Safety Evaluation Report (SER) for NRC IEB 80-11, Masonry Wall Design, rather than the method applied in the related KPS submittal. Specifically, the damping values used in KPS response to IEB 80-11 were 0.5 % and 1.0 % for OBE and SSE. The NRC had utilized SGEH Criteria for Safety Related Masonry Wall evaluations, which allow the use of higher damping values of 4 % and 7 % for OBE and SSE, in their SER approving the KPS approach for addressing IEB 80-11. These criteria were supplied to KPS as Appendix A to the subject NRC SER (FRC report TER-C5506-260).

### **10CFR50.59 Evaluation 05-12-00**

**Activity Evaluated:** Fire Barrier Impairment 05-176.

**Brief Description:** Barrier Impairment 05-176 authorized blocking Door-151 in the open position, as a compensatory measure to establish operability/functionality for a concrete masonry block wall.

**Reason for the Change:** KPS identified that it was necessary to block the door open to improve the venting of a room within the KPS auxiliary building to ensure that atmospheric pressure changes, induced by a postulated tornado, would not result in a failure of an affected concrete masonry block wall.

**Summary:** As a compensatory measure to ensure the operability/functionality of a concrete masonry block wall, comprising part of the Radiologically Controlled Area Boundary, KPS determined it was appropriate to block open Door-151, a door credited in the KPS Appendix R program, with a full time fire watch at the affected door. Subsequent assessments determined that the KPS Appendix R / Fire Program allowed the watch to be changed to an hourly fire watch. A subsequent plant modification allowed returning Door-151 to its normally closed position.

### **10CFR50.59 Evaluation 06-02-00**

**Activity Evaluated:** KPS Technical Requirements Manual (TRM) Rev. 12.

**Brief Description:** The TRM revision involved a method of evaluation (MOE) described in the KPS TRM/COLR. The specific MOE is that used for the evaluation of uncertainties for measured core peaking factors.

**Reason for the Change:** The TRM revision was made to afford KPS additional operational flexibility with movable detector thimble availability below 75%.

**Summary:** Pursuant to the requirements of KPS Technical Specification 3.11.a., an analysis was performed to support the aforementioned change, to allow the additional operational flexibility. The supporting analysis was performed by Westinghouse, to support KPS operations with as few as 50% of movable detector thimbles available. Report NF-WP-05-15 documents the analysis, the impacts of increased uncertainties on peaking factors, and recommended plant operational requirements for a reduction to 50% of the movable detector incore thimbles during an operating cycle.

The analysis documented in NF-WP-05-15 was performed using the MOE applied in WCAP 7308-P-A. WCAP 7308-P-A was approved by the NRC (letter from A. Thadani (NRC) to W. Johnson (Westinghouse), "Acceptance of Licensing Report WCAP 7308-L and Update of March 1984 Evaluation of Nuclear Hot Channel Factor Uncertainties as a Reference Report," dated March 24, 1988). The NRC Safety Evaluation Report is included in WCAP 7308-P-A.

## **10CFR50.59 Evaluation 06-03-00**

**Activity Evaluated:** KPS Calculation SIR-06-422, Rev. 0.

**Brief Description:** SIR-06-422, Rev. 0, evaluates as-built sample tubing located between the containment and the Auxiliary Building to ASME Section III, Class I requirements.

**Reason for the Change:** During an evaluation of the as-built configuration of the subject sample tubing, it was determined that analyses allowed under ASME Section III would be better suited to the application than the analytical method used in the KPS licensing basis method described in USAS B 31.1.

**Summary:** The subject sample tubing was originally installed in accordance with USAS B31.1-1967 requirements. KPS has elected to use ASME Section III Class 1 methodology to evaluate the tubing for recently identified loading conditions. The ASME methodology includes more sophisticated and rigorous analytical techniques. USAS B31.1, which states that a designer who is capable of a more rigorous analysis than is specified in the Code, may justify an alternate design, and still satisfy the basic intent of the Code. The use of Section III Class I was limited to the application where considered appropriate.

## **Commitment Change Evaluation Summary**

### **Document(s) Evaluated:**

1. Letter to NRC from WPSC dated September 11, 1987, IE Bulletin 87-01: Thinning of Pipe Walls in Nuclear Power Plants

**Brief Description:** The above referenced letter was in response to IE Bulletin 87-01 and stated, "MS lines to the HP turbine will be inspected approximately every 7 years". This commitment was revised to state, "MS lines to the HP turbine will be monitored as part of the pipe inspection program. Inspection frequencies vary based on predicted and measured wear rates, as well as replacement history in accordance with the Flow Accelerated Corrosion (FAC) Program. The pipe inspection program was renamed the FAC program after the original commitment."

**Bases for change:** Inspection frequencies will vary based on replacement history, as well as predicted and measured wear rates. This is tracked and trended by the FAC program. The basis for the change is due to the high quality of the steam in the Main Steam system.

EPRI report NSAC-202L-R2, Recommendations for an Effective Flow-Accelerated Corrosion (FAC) Program, describes certain exclusion criteria as the basis for excluding systems or portions of systems from evaluation due to resistance to FAC. One of the exclusion criteria is superheated steam systems with no moisture content, regardless of temperature or pressure level. Although the Kewaunee Main Steam system is of a very high quality, it is not superheated. The FAC program susceptibility evaluation for piping selection, X10021, states that the Main Steam piping from the steam generators to the

HP turbine should be included in the inspection program. However, it was decided not to model the piping using the CHECWORKS predictive software. The basis for this decision came from a recommendation made by EPRI employees during an on-site visit on 7/15/93. The basis, as documented in the evaluation, is due to the high quality of the steam in the Main Steam system.

Inspection history for components in the Main Steam line from the Steam Generators (SG) to the HP turbine is documented and based on the documented information, it has been determined that engineering judgment will be used to select high risk ranked components in the Main Steam system for future inspections.

### **Commitment Change Evaluation Summary**

#### **Document(s) Evaluated:**

1. Letter from C. W. Lambert (NMC) to Document Control Desk (NRC), "Kewaunee Improvement Initiatives – Commitments," dated March 18, 2005 (ADAMS Accession No. ML050820213).
2. Letter from E. S. Grecheck (DEK) to Document Control Desk (NRC), "Endorsement and Adoption of Licensing Actions," dated September 15, 2005 (ADAMS Accession No. ML052590234).
3. Letter from W. R. Matthews (DEK) to Document Control Desk (NRC), "Update on Improvement Initiatives," dated November 14, 2005 (ADAMS Accession No. ML053190099).
4. Letter from W. R. Matthews (DEK) to Document Control Desk (NRC), "Closure of Improvement Initiatives to Corrective Action Program," dated December 5, 2006, (ADAMS Accession No. ML063390666).

**Brief Description:** The commitment was to complete AC electrical models and calculations to provide clear bases for safety related settings and loads. Calculations were to be completed, validated and issued by the end of the 1<sup>st</sup> Quarter 2007 but the completion has been delayed to September 30, 2007.

**Bases for change:** The overall Electrical Calculation Project continues to be expected for completion by December 31, 2007 as originally discussed with the NRC. The calculations identified in this commitment will be completed by September 30, 2007.

There were significant delays with obtaining the motor data from the vendors (many of the motor models need to be recreated by the vendors and it took one year longer than anticipated). Also, delays have been incurred because of quality issues with the initial products submitted by the contractor. The overall Electrical Calculation Project continues to be expected for completion by December 31, 2007 as originally discussed with the NRC. The calculations identified in this commitment will be completed by September 30, 2007. Additional resources have been added to the team to ensure project completion by the stated dates.

## **Commitment Change Evaluation Summary**

### **Document(s) Evaluated:**

1. Letter from C. W. Lambert (NMC) to Document Control Desk (NRC), "Kewaunee Improvement Initiatives – Commitments," dated March 18, 2005 (ADAMS Accession No. ML050820213).
2. Letter from E. S. Grecheck (DEK) to Document Control Desk (NRC), "Endorsement and Adoption of Licensing Actions," dated September 15, 2005 (ADAMS Accession No. ML052590234).
3. Letter from W. R. Matthews (DEK) to Document Control Desk (NRC), "Update on Improvement Initiatives," dated November 14, 2005 (ADAMS Accession No. ML053190099).
4. Letter from W. R. Matthews (DEK) to Document Control Desk (NRC), "Closure of Improvement Initiatives to Corrective Action Program," dated December 5, 2006, (ADAMS Accession No. ML063390666).

**Brief Description:** The commitment was to train on, and implement Westinghouse Owners Group (WOG) Integrated Plant Emergency Operating Procedures (IPEOPs), Revision 2 into Kewaunee Power Station IPEOPs during the first quarter of 2007; the completion date has been delayed until July 31, 2007.

**Bases for change:** The reason for this change is that the due date for implementation and training of the IPEOP Rev. 2 upgrade was decided prior to the decision to provide the Kewaunee Operating Crews with High Intensity Training. Due to the decision to provide the operating crews with High Intensity Training, it has now been determined that training and implementation of the IPEOP Rev. 2 upgrade will not be able to be accomplished by the end of the 2<sup>nd</sup> Quarter 2007. The training on the IPEOP Rev. 2 is currently being conducted during the Operations Department High Intensity Training Program and the IPEOPs will be issued in late June 2007, when five of the six operating crews have been trained on the IPEOP changes. The sixth operating crew will receive training on the Rev.2 upgrade of the IPEOPs in July 2007, during the final session of High Intensity Training.

**Summary:** Kewaunee Operations Training is conducting High Intensity Training for the operating crews, which began during the 1<sup>st</sup> quarter 2007. Training on the revised IPEOPs is being conducted as part of this High Intensity Training.

The issuance of the revised IPEOPs will occur at the end of the 2<sup>nd</sup> quarter 2007 with five of the six operating crews having completed the High Intensity Training program and having been trained on revision of the IPEOPs. The sixth operations crew will receive training on the Rev 2 IPEOP upgrade in July 2007, during the final session of High Intensity Training. This sixth crew will have license restrictions in place while they are attending their High Intensity Training through July of 2007, so that the issuance of the revised IPEOPs can indeed occur at the end of the 2<sup>nd</sup> quarter 2007.

## **Commitment Change Evaluation Summary**

### **Document(s) Evaluated:**

1. Letter from A. Schwencer (USNRC) to E.W. James (WPSC), "Re: Containment Purging During Normal Plant Operation" dated November 28, 1978.
2. Letter from E.R. Mathews (WPSC) to A. Schwencer (USNRC) "Containment Purging During Normal Plant Operation" dated July 13, 1979.
3. Letter from A. Schwencer (USNRC) to E. R. Mathews (WPSC), "RE: Containment Purging During Normal Plant Operation" dated October 23, 1979.
4. Letter from E.R. Mathews (WPSC) to A. Schwencer (USNRC) "Containment Purge and Vent System" dated December 10, 1979.
5. Letter from Steven A. Varga (USNRC) to C. W. Giesler (WPSC), "Completion of Valve Operability Reviews for Large Pratt Butterfly Valves Used for Purge or Vent of Containments – Kewaunee" dated February 13, 1983.
6. Letter from C.W. Giesler (WPSC) to Steven A. Varga (USNRC) "Operability of Large Pratt Butterfly Valves Used for Containment Isolation – Kewaunee" dated March 7, 1983.
7. Letter from Steven A. Varga (USNRC) to C.W. Giesler (WPSC), "Completion of the Review of Venting and Purging Containment While at Full Power and Effect on LOCA (MPA B-24)" dated April 22, 1983.

**Brief Description:** In a March 7, 1983 letter to the NRC Kewaunee committed to sealing the reactor building vent (RBV) valves (RBV-I, 2, 3, & 4) closed when the plant was above hot shutdown. The commitment was revised to require sealing the RBV valves closed when the plant was above cold shutdown.

**Bases for change:** Kewaunee's existing commitment is not consistent with current industry standards. The new commitment is more restrictive and conservative by limiting operation of the valves to cold shutdown, refueling shutdown, and defueled conditions. Furthermore the new commitment is aligned with current industry standards. The proposed change is also consistent with the NRC staff's position as described in section 6.2.4.II.6.f of the standard review plan.

The commitment change does not change Kewaunee's commitment to test the valves to assure they meet their Appendix J leak limits. Provision 6 of NUREG-0737 item II.E.4.2 describes the requirement to seal the RBV valves closed in operational modes 1, 2, 3, and 4. WPSC had taken exception to this requirement and obtained an SER that allowed operation with the valves open while the plant was sub critical. The new commitment more closely aligns the Kewaunee plant with the NRC staff's original position and industry norms. The new commitment assures the valves will be closed any time the reactor is above cold shutdown.