



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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May 13, 2011

Mr. David A. Heacock
President and Chief Nuclear Officer
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5000 Dominion Boulevard
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**SUBJECT: KEWAUNEE POWER STATION – NRC TEMPORARY INSTRUCTION 2515/183
INSPECTION REPORT 05000305/2011009**

Dear Mr. Heacock:

On April 29, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Kewaunee Power Station, using Temporary Instruction (TI) 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event." The enclosed inspection report documents the inspection results which were discussed on May 5, 2011, with Mr. R. Simmons and other members of your staff.

The objective of this inspection was to promptly assess the capabilities of Kewaunee Power Station to respond to extraordinary consequences similar to those that have recently occurred at the Japanese Fukushima Daiichi Nuclear Station. The results from this inspection, along with the results from this inspection performed at other operating commercial nuclear plants in the United States, will be used to evaluate the U.S. nuclear industry's readiness to safely respond to similar events. These results will also help the NRC to determine if additional regulatory actions are warranted.

All of the potential issues and observations identified by this inspection are contained in this report. The NRC's Reactor Oversight Process will further evaluate any issues to determine if they are regulatory findings or violations. Any resulting findings or violations will be documented by the NRC in the next quarterly report. You are not required to respond to this letter.

D. Heacock

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Sincerely,

/RA/

Michael A. Kunowski, Chief
Branch 5
Division of Reactor Projects

Docket No. 50-305
License No. DPR-43

Enclosure: Inspection Report 05000305/2011009

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-305
License No: DPR-43

Report No: 05000305/2011009

Licensee: Dominion Energy Kewaunee, Inc.

Facility: Kewaunee Power Station

Location: Kewaunee, WI

Dates: March 23 through April 29, 2011

Inspectors: R. Krsek, Senior Resident Inspector
K. Barclay, Resident Inspector

Approved by: Michael A. Kunowski, Chief
Branch 5
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000305/2011009, 03/23/2011 – 04/29/2011; Kewaunee Power Station Temporary Instruction 2515/183 - Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event.

This report covers an announced Temporary Instruction (TI) inspection. The inspection was conducted by the Resident Inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

INSPECTION SCOPE

The intent of the TI is to provide a broad overview of the industry's preparedness for events that may exceed the current design basis for a plant. The focus of the TI was on (1) assessing the licensee's capability to mitigate consequences from large fires or explosions on site, (2) assessing the licensee's capability to mitigate station blackout (SBO) conditions, (3) assessing the licensee's capability to mitigate internal and external flooding events accounted for by the station's design, and (4) assessing the thoroughness of the licensee's walk downs and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events possible for the site. If necessary, a more specific follow-up inspection will be performed at a later date.

INSPECTION RESULTS

All of the potential issues and observations identified by this inspection are contained in this report. The NRC's Reactor Oversight Process will further evaluate any issues to determine if they are regulatory findings or violations. Any resulting findings or violations will be documented by the NRC in the next quarterly report.

03.01 Assess the licensee’s capability to mitigate conditions that result from beyond design basis events, typically bounded by security threats, committed to as part of NRC Security Order Section B.5.b issued February 25, 2002, and severe accident management guidelines (SAMGs) and as required by Title 10 of the Code of Federal Regulations (10 CFR) 50.54(hh). Use Inspection Procedure (IP) 71111.05T, “Fire Protection (Triennial),” Section 02.03 and 03.03 as a guideline. If IP 71111.05T was recently performed at the facility, the inspector should review the inspection results and findings to identify any other potential areas of inspection. Particular emphasis should be placed on strategies related to the spent fuel pool. The inspection should include, but not be limited to, an assessment of any licensee actions to:

Licensee Action	Describe what the licensee did to test or inspect equipment.
<p>a. Verify through test or inspection that equipment is available and functional. Active equipment shall be tested and passive equipment shall be walked down and inspected. It is not expected that permanently installed equipment that is tested under an existing regulatory testing program be retested.</p> <p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>Licensee actions included the identification of equipment (active and passive) utilized for implementation of B.5.b actions and any additional equipment used in SAMGs. The scope of the equipment for walkdowns and testing was defined as that equipment specifically designated for B.5.b or SAMG mitigation (i.e., special hoses, fittings, spare battery charger, portable pumps, etc.).</p> <p>Permanent plant equipment (i.e., in situ equipment) was not considered in the scope, since it is normally in service, subjected to planned maintenance, and/or checked on operator rounds. The licensee identified surveillances/tests and performance frequencies for the identified equipment, and verified satisfactory completion of those tests.</p> <p>Active equipment within the scope defined above that did not have recent test results were tested, including the portable diesel-driven fire pump and spare battery charger. Passive equipment within the scope was walked down and inspected.</p>
	<p>Describe inspector actions taken to confirm equipment readiness (e.g., observed a test, reviewed test results, discussed actions, reviewed records, etc.).</p>
	<p>The inspectors assessed the licensee’s capabilities by reviewing the licensee’s walkdown and verification activities performed for the B.5.b and SAMG active and passive equipment. The assessment was performed through verification of the completeness of the licensee’s equipment lists and sampling of the permanent plant equipment list reviews.</p> <p>The inspectors assessed the licensee’s active equipment capabilities by reviewing the licensee’s walkdown activities. In addition, the inspectors independently walked down and inspected all major B.5.b and SAMG contingency response equipment staged onsite for adequate placement and material condition. The inspectors also verified that routine preventive maintenance activities existed for B.5.b and SAMG equipment at an appropriate frequency to ensure the equipment would be available when called upon.</p>

	<p>The inspectors also observed the licensee’s performance testing of the portable diesel-driven fire pump and the spare battery charger and independently verified the materiel condition of this specific equipment.</p> <p>Discuss general results including corrective actions by licensee.</p> <p>All equipment (active and passive) designated for the implementation of B.5.b actions and SAMGs was verified by the licensee to be in applicable procedures. Passive equipment was walked down and verified to be in place and ready for use. Passive equipment which had surveillance and/or preventive maintenance tasks had those activities performed to verify readiness for use. All active equipment located at the site was verified in place by the licensee. The licensee retested all active equipment. The licensee’s review demonstrated that the current licensing basis of the equipment credited for B.5.b actions and SAMGs was met. However, the licensee did identify the following equipment issue:</p> <ul style="list-style-type: none"> • An adapter was needed for a hose connection to a spool piece. The licensee initiated condition report (CR) CR418599, the adapter was fabricated, and the equipment was appropriately staged by the completion of this inspection. <p>The inspectors performed an independent review of licensee procedures and equipment and concluded that the equipment was capable of meeting the current licensing basis (CLB). The inspectors had the following observation as a result of the inspection:</p> <ul style="list-style-type: none"> • An enhancement could be made in the roadway leading to the plant intake structure. The licensee initiated CR425083 to evaluate this potential enhancement.
Licensee Action	<p>Describe the licensee’s actions to verify that procedures are in place and can be executed (e.g., walkdowns, demonstrations, tests, etc.).</p>
<p>b. Verify through walkdowns or demonstration that procedures to implement the strategies associated with B.5.b and 10 CFR 50.54(hh) are in place and are executable. Licensees may choose not to connect or operate permanently installed equipment during this verification.</p>	<p>Licensee actions included the identification of those procedures utilized to mitigate the consequences of a B.5.b related event and severe accidents. The licensee performed walkdowns, tabletops, and demonstrations using the identified abnormal operating procedures (AOPs), severe accident control room guidelines (SACRGs), and B.5.b and SAMG procedures credited for B.5.b and SAMG strategic actions. The licensee evaluated the ability to perform the procedures and reviewed equipment and plant accessibility needed to perform proceduralized actions. Additionally, for those procedures that could not be walked down or simulated, the licensee completed tabletop exercises with qualified individuals to verify that the procedures could be implemented as written. Open change requests were reviewed for potential impacts on procedure functionality.</p>

<p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>Describe inspector actions and the sample strategies reviewed. Assess whether procedures were in place and could be used as intended.</p>
	<p>The licensee’s actions as discussed above were completed prior to the issuance of NRC TI 2515/183. The inspectors assessed the licensee’s capabilities by conducting reviewing all appropriate AOPs, and SACRG, B.5.b, and SAMG procedures. In addition, the inspectors reviewed licensee procedures and conducted walkdowns of plant areas discussed in several selected sections of those procedures to independently verify the licensee’s conclusions. The inspectors walked down a selected portion of B.5.b procedures as part of this effort. The inspectors independently reviewed the routes for the transportation, setup, and use of the portable diesel-driven fire pump and hoses to verify that the routes were accessible and usable as prescribed in the licensee’s procedures.</p>
	<p>Discuss general results including corrective actions by licensee.</p>
	<p>During the licensee’s reviews, the licensee demonstrated that, in general, the procedures utilized to execute B.5.b and SAMG strategies were adequate. However, the licensee did identify the following issues as part of their review:</p> <ul style="list-style-type: none"> • PRP-01, “Recovery Plan for Catastrophic Events,” contained five steps that could not be performed as written. The licensee initiated CR418583 and immediately corrected the steps. • PRP-01 specified the incorrect location of a piece of equipment; however, licensee response personnel were aware of the current equipment location. The licensee initiated CR418213 to correct the issue. • PRP-02 and PRP-03, “Initial Response to Catastrophic Events,” were executable; however, several procedure enhancements were identified. The licensee initiated CR418613 and CR418615 to correct these issues. • B.5.b procedures do not have a periodic review. The licensee initiated CR419669 to correct the issue. • SACRG-01, “Severe Accident Control Room Guideline – Initial Response,” and SACRG-02, “Severe Accident Control Room Guideline – After TSC is Functional,” were executable; however, several procedure enhancements were identified.

	<p>The licensee initiated CR418424 and CR418429 to correct these issues.</p> <ul style="list-style-type: none"> • SAG-01, “Feed the Steam Generators,” had several discrepancies, but the procedure could be accomplished with available equipment in the field; however, the clarification and fabrication of additional components would enhance the time for completion of procedural actions. The licensee initiated CR418449 to correct this issue. • SAG-03, “Inject into the RCS,” was executable; however, several procedure enhancements were identified. The licensee initiated CR418466 to correct this issue. • SAG-04, “Inject into Containment,” was executable; however, several procedure enhancements were identified to ensure clarity for completion. The licensee initiated CR418439 to correct this issue. • SAG-05, “Reduce Fission Product Releases,” was executable; however, several procedure enhancements were identified to ensure clarity for completion. The licensee initiated CR418439 to correct this issue. • SAMG procedures had an inadequate periodic review, as evidenced by the number of procedural issues identified during the licensee's review. The licensee initiated CR419676 to correct the issue. • RP-KW-003-004, “Emergency TLD’s Issuing and Processing,” was not revised after a change in the actual process; however, emergency dosimeters would still be able to be issued. The licensee initiated CR418597 to correct this issue. <p>The inspectors performed an independent review of the licensee’s related procedures, including field walkdowns and tabletop procedure reviews. The inspectors had the following observations as a result of the inspection:</p> <ul style="list-style-type: none"> • The licensee had not incorporated applicable B.5.b strategies into the SAMG procedures. The inspectors identified that CR038990 and CR039498 written in November 2006 both had corrective actions to integrate the applicable strategies into the SAMG procedures; however, the corrective actions were closed without completion of this action. In addition, during their reviews, the inspectors noted that
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	<p>over half of the SAMGs were last revised on October 3, 2000. The licensee initiated CR424866 to evaluate this observation. The inspectors will continue to inspect this issue under IP 71152, "Problem Identification and Resolution," in the second quarter inspection period.</p> <ul style="list-style-type: none">• The licensee's hydrogen recombiners were stored offsite and required some lead time for delivery prior to being available for use onsite. While the licensee's procedures contained contact information for procurement of the hydrogen recombiners, the inspectors determined that the licensee's procedure network did not contain or prescribe any steps to direct ordering the hydrogen recombiners for arrival onsite. The inspectors were only able to identify procedures prescribing the use of the hydrogen recombiners. The licensee initiated CR424865 to evaluate this observation. The inspectors will continue to inspect this issue under IP 71111.04, "Equipment Alignment," in the second quarter inspection period.• The licensee's SAMG procedures lacked details on component descriptions and did not identify equipment locations for ease of implementation as an enhancement. The licensee initiated CR424855 to evaluate this observation.• SACRG-01, Attachment A, listed valves for idle flow path determinations, but excluded service water (SW) valves SW-4A(B) for the nonessential SW system loads. The licensee initiated CR424852 to evaluate this observation.• SACRG-02, Section 5.1, did not list SW and component cooling water (CCW) pumps as non-operating components that need to be started. The licensee initiated CR424864 to evaluate this observation.• PRP-02, Step 26, directed the operators to return to Step 5 without a caution or note to leave a ruptured steam generator isolated unless needed for reactor coolant system cooldown. The licensee initiated CR425961 to evaluate this observation.• The licensee's SAMG procedure network is owned and reviewed by the Reactor Engineering and Emergency Preparedness departments, without any apparent routine technical reviews conducted by the Operations department. The licensee initiated CR424681 to evaluate this observation.
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	<ul style="list-style-type: none"> The licensee's B.5.b procedures lacked details on component descriptions and did not identify equipment locations for ease of implementation as an enhancement. The licensee initiated CR424858 to evaluate this observation.
Licensee Action	Describe the licensee's actions and conclusions regarding training and qualifications of operators and support staff.
c. Verify the training and qualifications of operators and the support staff needed to implement the procedures and work instructions are current for activities related to Security Order Section B.5.b and severe accident management guidelines as required by 10 CFR 50.54(hh).	<p>The licensee identified training/qualification requirements for operations, support staff, and the fire brigade for the implementation of actions needed to mitigate a B.5.b related event, and for implementation of actions needed for the SAMGs. The licensee documented that operator training and fire brigade requirements were current.</p> <p>The licensee identified training/qualification requirements for applicable emergency response organization (ERO) command and support staff for the implementation of actions needed to mitigate a B.5.b related event, and for the implementation of actions needed for the SAMGs. The licensee verified that ERO command and support staff training requirements were current and accurately documented. Additionally, the licensee reviewed the number of individuals qualified for each of the positions and the number of individuals required for each shift to ensure credited actions could be performed.</p>
	<p>Describe inspector actions and the sample strategies reviewed to assess training and qualifications of operators and support staff</p> <p>The licensee's actions as discussed above were completed prior to the issuance of NRC TI 2515/183. The inspectors verified the adequacy of initial and continuing training programs for licensed and non-licensed operators, support staff, and the fire brigade, needed to ensure successful implementation of procedures and work instructions related to B.5.b and SAMG procedures. Additionally, the inspectors verified that the training was documented and current.</p> <p>The inspectors also verified the adequacy of the training and qualifications for applicable ERO command and support staff for the implementation of actions needed to mitigate a B.5.b related event, and the implementation of actions needed for the SAMGs. The inspectors verified the training was documented and current.</p>

Discuss general results including corrective actions by licensee.

The training requirements, qualifications, and associated records needed for operators for the implementation of SAMGs and B.5.b event response were reviewed by the licensee. Training was identified for shift managers, shift technical advisors, and unit supervisors. The licensee verified that the training requirements were embedded within the position qualifications for the operators, and confirmed that all shift operators verify their qualifications prior to assuming a shift position. Licensed reactor operators were verified to receive training during initial license class and biannually for SAMGs during requalification training. In addition, licensed operators received triennial B.5.b event response training; however, at the time of this inspection, operations training staff were revising the requalification training guide to make this training biannual. The licensee reviewed training requirements, qualifications, and associated records needed for ERO command and support staff for the implementation of actions needed to mitigate a B.5.b event or implement the SAMGs, and verified it was current. The licensee identified the following issue during the review of training:

- Operations training, technical training, and maintenance training did not include specific training on the use and installation of the hydrogen recombiners. The licensee initiated CR419677 to evaluate the need for training on the use of the hydrogen recombiners.

The inspectors performed an independent review of the licensee's training lesson plans and guides, which included interviews with training personnel and students, and verification of requirements in training lesson plans and matrices. The inspectors had the following observations:

- The ERO initial and continuing training program did not provide adequate detailed training to ERO members whose responsibilities would include implementation of the B.5.b procedures. The inspectors identified that while licensed and non-licensed operators received adequate training on B.5.b procedures, the training program only required ERO members to attend initial training, which contained only one slide covering the procedures for the B.5.b strategies. The inspectors noted that members of the ERO who were at the site during initial B.5.b implementation had received detailed procedures training at that time; however, a training needs analysis was not performed at that time and therefore, this training was not

	<p>incorporated into initial and continuing training. The licensee initiated CR424870 to evaluate this observation. The inspectors will continue to inspect this issue under IP 71152, "Problem Identification and Resolution," in the second quarter inspection period.</p> <ul style="list-style-type: none"> • An adequate training needs analysis was not performed for B.5.b strategy procedure implementation for initial and continuing training of maintenance personnel. As a result, mechanical and electrical maintenance personnel did not receive any procedure implementation training. Instrumentation and Control personnel who were present for the initial implementation were trained; however, that specific training was not incorporated into initial and continuing training. The licensee initiated CR423104 to evaluate this observation. • The licensed operator initial and continuing training adequately addressed both B.5.b and SAMG training; however, the non-licensed operator initial and continuing training only addressed B.5.b. The licensee initiated CR423711 and CR423733 to evaluate this observation. • Maintenance personnel do not receive any SAMG procedure implementation training. The licensee initiated CR424870 to evaluate this observation.
Licensee Action	Describe the licensee's actions and conclusions regarding applicable agreements and contracts are in place.
<p>d. Verify that any applicable agreements and contracts are in place and are capable of meeting the conditions needed to mitigate the consequences of these events.</p> <p>This review should be done for a reasonable sample of mitigating strategies/equipment.</p>	<p>The licensee reviewed its B.5.b procedures to determine what agreements or contracts would be needed to support necessary B.5.b actions and verified the agreements or contracts were in place and current.</p> <p>For a sample of mitigating strategies involving contracts or agreements with offsite entities, describe inspector actions to confirm agreements and contracts are in place and current (e.g., confirm that offsite fire assistance agreement is in place and current).</p> <p>The inspectors assessed the licensee's capabilities by conducting an independent sample of the licensee's emergency response agreements, purchase orders, and contracts. The inspectors' review verified that they were current, and assessed whether or not it was adequate for meeting the licensee's mitigation strategy. The inspectors did confirm that the offsite fire assistance agreement with the City of Kewaunee was in place and current.</p>

	<p>Discuss general results including corrective actions by licensee.</p> <p>The licensee's review did not identify expired agreements or deficiencies requiring changes. The inspectors identified two agreements that were not current with the following observations:</p> <ul style="list-style-type: none"> • The agreement with the U.S. Department of Energy was not with the current licensee, but with a prior owner, Wisconsin Public Service Corporation. The agreement was dated August 12, 1998, and contained a recommendation from the U.S. Department of Energy to update the agreement every two years to ensure all the information remained current. The licensee initiated CR425608 to evaluate this observation and update the agreement. • The agreement with the City of Two Rivers Fire Department Ambulance, dated January 16, 2003, was not with the current licensee, but with a prior owner, Nuclear Management Company. The licensee initiated CR425608 to evaluate this observation and update the agreement. • The agreement between the licensee and the Point Beach Nuclear Plant for shared equipment and resources was current; however, the inspectors noted the agreement could be enhanced to list available resources and equipment for Kewaunee staff's use during an emergency or beyond design basis situation, if the Point Beach Nuclear Plant was not affected by a similar event. The licensee initiated CR425962 to evaluate this observation.
<p>Licensee Action</p>	<p>Document the corrective action report number and briefly summarize problems noted by the licensee that have significant potential to prevent the success of any existing mitigating strategy.</p>
<p>e. Review any open corrective action documents to assess problems with mitigating strategy implementation identified by the licensee. Assess the impact of the problem on the mitigating capability and the remaining capability that is not impacted.</p>	<p>The corrective action report number and issues identified by the licensee that have potential to prevent the success of any existing mitigating actions are discussed in each of the general results sections.</p> <p>The inspectors reviewed each CR for potential impact to the licensee's mitigation strategies. Where significant impacts were identified, the inspectors verified the licensee implemented timely corrective actions. The inspectors verified the identification, classification, and planned corrective actions were consistent with the timelines prescribed in the licensee's corrective action program (CAP).</p>

03.02 Assess the licensee’s capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63, “Loss of All Alternating Current Power,” and station design, is functional and valid. Refer to TI 2515/120, “Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22,” as a guideline. It is not intended that TI 2515/120 be completely re-inspected. The inspection should include, but not be limited to, an assessment of any licensee actions to:

<p style="text-align: center;">Licensee Action</p>	<p>Describe the licensee’s actions to verify the adequacy of equipment needed to mitigate an SBO event.</p>
<p>a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>Licensee actions included identification of equipment utilized/required for mitigation of a SBO. The licensee then conducted walkdowns of this equipment to ensure they were adequate and properly staged. Additionally, the licensee also conducted a review of open CAP items for potential SBO equipment impact. Specifically, the licensee verified that appropriate lighting, tools, power cables, and other equipment were properly staged, tested, and maintained.</p> <p>Describe inspector actions to verify equipment is available and useable.</p> <p>The inspectors assessed the licensee’s capability to mitigate SBO conditions by reviewing the licensee’s walkdown activities. In addition, the inspectors selected a sample of equipment utilized/required for mitigation of an SBO and conducted independent walkdowns of that equipment to verify that the equipment was properly aligned and staged. The sample of equipment selected by the inspectors included, but was not limited to, the SBO diesel generator, its auxiliaries, and equipment staged for implementation of SBO procedures.</p>
	<p>Discuss general results including corrective actions by licensee.</p> <p>In general, the licensee’s reviews verified that SBO equipment was ready to respond to an SBO. The licensee did not identify any equipment issues.</p> <p>The inspectors independently reviewed the licensee’s SBO-related equipment. The review included walkdowns of the equipment reviewed by the licensee, as well as equipment not reviewed by the licensee. The inspectors had the following observation as a result of the inspection:</p> <ul style="list-style-type: none"> • The alternate alternating current (AAC) source for Kewaunee was the Technical Support Center (TSC) diesel generator. The inspectors noted that some components and subsystems for the TSC diesel generator were located on the roof of the TSC. Specifically, the radiator and radiator cooling fan were located on the

	<p>TSC roof. The inspectors reviewed the licensee’s SBO license submittals and concluded that the licensee stated that the TSC diesel generator met the NUMARC 87-00, “Guidelines And Technical Bases For NUMARC Initiatives Addressing Station Blackout At Light Water Reactors,” Appendix B.3 criteria for weather events, with no exceptions noted in the submittal. The NUMARC guidance stated, in part, that components and subsystems shall be protected against the effects of likely weather-related events that may initiate the loss of offsite power event. In addition, the NUMARC guidance states that protection may be provided by enclosing the AAC components within structures that conform to the Uniform Building Code. Since the radiator and cooling fan were exposed on the roof of the TSC, and no specific details regarding these components were contained in the licensee’s submittals, the inspectors requested the engineering and design information to verify that the components were adequately protected per the criteria and the licensee’s submittal. The licensee determined this documentation did not exist. The licensee initiated CR424488 and documented that TSC diesel generator components were not enclosed in a structure. The licensee performed a functionality determination, which concluded the radiator and cooling fan would withstand the Uniform Building Code wind and pressure loads; however, the components were not located within a structure. The inspectors will continue to inspect this issue under IP 71111.04, “Equipment Alignment,” in the 2011 second quarter inspection period.</p> <ul style="list-style-type: none"> • In NRC Inspection Report 05000305/2011002, Section 4OA3.1, the inspectors opened an unresolved item (URI) for the failure of the TSC diesel generator to load bus 46 during a partial loss of offsite power event. The inspectors verified that the licensee took immediate corrective actions to repair the failed breaker latching relay. However, the inspectors were still reviewing this issue in the 2011 second quarter inspection period to determine if a performance deficiency occurred.
Licensee Action	Describe the licensee’s actions to verify the capability to mitigate an SBO event.
<p>b. Demonstrate through walkdowns that procedures for response to an SBO are executable.</p>	<p>The licensee did not review procedure ECA 0.0, “Loss of All AC Power,” or the AOP for abnormal auxiliary feedwater system (AFW) operation referenced in ECA 0.0, because these procedures were routinely performed in the simulator. Licensee actions included the identification of additional power-related AOPs, along with verification that the identified procedures were current, and that no critical revision requests were in place. The licensee then walked down and verified that the AOPs had been properly validated. Additionally, the</p>

	<p>licensee conducted a review of open CAP items for potential impact to SBO procedures. The licensee reviewed the following procedures:</p> <ul style="list-style-type: none"> • OP-KW-NOP-SUB-002; Restoration Of Off-Site Power; Revision 6; • OP-KW-AOP-EHV-008; Loss Of All AC Power During Shutdown Conditions; Revision 3; • OP-KW-ARP-47086-1; TSC Diesel Gen Abnormal; Revision 1; • OP-KW-AOP-DGM-002A; Abnormal Diesel Generator A; Revision 4; • OP-KW-AOP-DGM-002B; Abnormal Diesel Generator B; Revision 6; • OP-KW-AOP-RHR-001; Abnormal Residual Heat Removal System Operation; • OP-KW-AOP-SFP-001; Abnormal Spent Fuel Pool Cooling And Cleanup System Operation; • OP-KW-EHV-005; Loss Of 4160V Bus 5; Revision 12; and • OP-KW-EHV-006; Loss Of 4160V Bus 6; Revision 11.
	<p>Describe inspector actions to assess whether procedures were in place and could be used as intended.</p> <p>The inspectors assessed the licensee’s capabilities by reviewing the licensee’s walkdown activities. In addition, the inspectors walked down plant areas discussed in several sections of a sample of the procedures walked down by the licensee to independently verify the licensee’s conclusions.</p> <p>Additionally, the inspectors independently reviewed procedure ECA 0.0 and OP-KW-AOP-AFW-001, “Abnormal Auxiliary Feedwater System Operation,” to verify the procedures could be performed as written. The inspectors also performed walkdowns and inspections of areas that required local operation of equipment. Specifically, the inspectors walked down areas around the condenser steam dumps, the feedwater regulating valves, the main steam isolation valves, the AFW pump rooms, and the TSC diesel generator to verify that the areas were accessible and had appropriate lighting and tools to perform the actions as required by their procedures.</p> <p>Discuss general results including corrective actions by licensee.</p> <p>In general, the licensee’s reviews verified that equipment specified in the AOPs was ready to respond under abnormal conditions and that the procedures could be implemented. The licensee did not identify any equipment or procedure issues.</p> <p>The inspectors reviewed the licensee’s SBO procedures and sampled AOPs.</p>

The inspectors did not identify any procedure issues or instances of materiel not properly staged in the field. The inspectors had the following observations as a result of the review:

- Improved Technical Specification Surveillance Requirement 3.7.6.1, requires, in part, that the usable volume in the condensate storage tanks (CSTs) is greater than or equal to 41,500 gallons. The inspectors reviewed calculation C10918, "Condensate Storage Tank Level Required to Meet T.S. 3.4.C," Revision 2, dated April 9, 2003, and determined that assumption 3.2.1 assumed that the operator will switch the AFW pump suction to the SW system at an indicated level of 4 percent to protect the AFW pumps from a loss of suction source. This equated to a volume of 41,500 gallons in the CST. In 2005, the licensee performed a reevaluation of the AFW system and in calculation C10859-4, "Condensate Storage Tank Level, Technical Specification Minimum Volume Requirement, Revision 2, dated August 24, 2005, the licensee calculated that at 5.5 percent vortexing was possible and with instrument uncertainty, the action level for switchover of suction sources was 12 percent. However, the inspectors noted that calculation C10918, Revision 2, was not revised to reflect this newly calculated level value for AFW pump suction protection. The licensee initiated CR425837 to capture the inspectors' observations. The inspectors will continue to inspect this issue under IP 71111.04, "Equipment Alignment," in the 2011 second quarter inspection period.
- Improved Technical Specification Surveillance Requirement 3.7.6.1, requires, in part, that the usable volume in the CSTs is greater than or equal to 41,500 gallons. The inspectors reviewed calculation CN-SEE-02-47, "Kewaunee Condensate Storage Tank Minimum Volume Analysis for 7.4 Percent Power Uprate Program," Revision 0, dated October 9, 2002, and determined that the calculation established a minimum CST volume based on restoring and maintaining no-load level in the steam generators, which equated to the steam generator narrow range level of 0 percent. The inspectors also noted that a CST water volume of 50,000 gallons was required to maintain hot standby conditions for 4 hours, refill the steam generators, and maintain a level of 4 percent narrow range level. The inspectors noted that procedure ECA 0.0, "Loss Of All AC Power," implemented by plant operators during an SBO, required operators to feed the steam generators at greater than 210 gallons per minute and to maintain a minimum steam generator level of 5 percent narrow range level. Therefore, the inspectors questioned why the operating procedures for an SBO, which established maintenance of a minimum 5 percent steam generator narrow range level, did not agree with the calculation,

	<p>which was based on maintaining a no-load level in the steam generators of 0 percent, a less conservative volume level. The licensee initiated CR425837 to capture the inspectors' observations. The inspectors will continue to inspect this issue under IP 71111.04, "Equipment Alignment," in the 2011 second quarter inspection period.</p>
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<p>03.03 Assess the licensee's capability to mitigate internal and external flooding events required by station design. Refer to IP 71111.01, "Adverse Weather Protection," Section 02.04, "Evaluate Readiness to Cope with External Flooding," as a guideline. The inspection should include, but not be limited to, an assessment of any licensee actions to verify through walkdowns and inspections that all required materials and equipment are adequate and properly staged. These walkdowns and inspections shall include verification that accessible doors, barriers, and penetration seals are functional.</p>	
<p>Licensee Action</p>	<p>Describe the licensee's actions to verify the capability to mitigate existing design basis flooding events.</p>
<p>a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>The licensee performed walkdowns of areas and structures, systems, and components (SSCs) credited to mitigate internal and external flooding events. Specifically, the licensee walked down and visually inspected the material condition of credited flood doors, flood barriers, drain system check valves, and flood detection level switches. Additionally, the licensee confirmed that inspections and surveillances of this equipment had been performed within the required period. The licensee also walked down the intake structure/screenhouse and intake forebay structure to inspect interior and exterior walls, floors, structure, and penetrations.</p>
	<p>Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.</p>
	<p>The inspectors independently walked down areas susceptible to flooding to verify that flood barriers, flood doors, penetrations, and credited drains were in good material condition and able to perform their intended functions. Specifically, the inspectors' walkdown included: the SW screenhouse, emergency diesel generator (EDG) rooms, 480-volt switchgear rooms, AFW pump rooms, battery rooms, as well as, select locations throughout the turbine and auxiliary buildings. Additionally, the inspectors reviewed previously performed inspections and surveillances for flood barriers, flood doors, drain system check valves and flood detection level switches to ensure they were performed within the required period and were adequate to evaluate the flood mitigating functions of the components. The inspectors also reviewed the licensee's alarm response procedures and AOPs for internal and external flooding to ensure procedures were in place and could be executed as written.</p>

Discuss general results including corrective actions by licensee.

The licensee's walkdown did not identify any flood door or flood barrier deficiencies not already documented in the CAP. The licensee's reviews confirmed that all flood doors and flood barriers needed to mitigate internal and external flooding events were inspected as part of a routine maintenance program. The licensee identified the following issues:

- A diesel-driven pump (originally purchased for the removal of flood waters during a loss of offsite power and stored on a shelf in Warehouse 1) was not referenced in site procedures, did not have an operating procedure, had not been tested, did not have a preventive maintenance task, and did not have an identified source of fuel. The licensee documented this issue in CR420149 and initiated corrective actions to correct the issue.
- Two sump pumps, credited in the licensee's probabilistic risk assessment, did not have preventive maintenance activities to periodically check the functionality of the pumps. The licensee documented this issue in the CR420602 and initiated corrective actions to correct the issue.

Previously identified open flooding concerns in the CAP, which were re-reviewed by the licensee as part of its effort, included the following issues:

- The licensee identified door seal deficiencies on external flooding doors 164 and 165. The licensee performed a reasonable assurance of safety (RAS) and verified that the seal degradation did not prevent the licensee from meeting the licensing basis. The concerns were documented in CR348087, CR420067, CR348085, CR348081, and RAS 105; and the licensee initiated corrective action to restore the degraded seals.
- During the most recent outage, water leaked past the flood barrier 11 seals. The licensee documented this issue in CR418301 and initiated a corrective action to resolve the issue.
- During a previous flooding inspection by the NRC, the resident inspectors identified corrosion on piping downstream of the credited floor drain check valves. The inspectors were concerned that corrosion on the carbon steel pipe could create a leak that would bypass the check valve or reduce the overall strength of the pipe and its ability to survive a seismic event. The licensee entered the issue into

	<p>CR401205 and initiated a corrective action to clean and properly coat the piping to prevent future corrosion.</p> <ul style="list-style-type: none"> • Clean out plugs in the screenhouse floor drain piping were not properly secured and leaked during normal SW backwash operation and caused leakage into the screenhouse. The licensee placed the covers back in place and weighted them down with sandbags to preclude leakage. The licensee entered these issues into the CAP as CR418867 and CR361156, and initiated a corrective action to have engineering permanently correct the design. <p>The inspectors identified no issues that would have prevented the SSCs and procedures from meeting the CLB. The inspectors had the following observations as a result of the inspection:</p> <ul style="list-style-type: none"> • During independent walkdowns, the inspectors identified that the basement of the TSC was connected to the basement of the auxiliary building through two air lock doors. The inspectors identified that no credited flooding barriers existed to preclude flood waters from a ruptured fire protection system in the TSC from entering the auxiliary building. The licensee determined that both doors were special ventilation doors, and one door had seals that would limit leakage into the auxiliary building because it was also a steam exclusion boundary. The doors also closed into their frames during a TSC flooding event and were not expected to fail. The licensee initiated CR424708 to further evaluate this observation. The inspectors will continue to inspect this issue under IP 71111.06, "Flood Protection Measures," in the 2011 second quarter inspection period. • During independent walkdowns, the inspectors identified that a SW pipe penetrated a wall separating the auxiliary building and the safeguards equipment portion of the turbine building. The safeguards portion included both trains of AFW pumps, both EDGs, and both trains of the 480-volt safeguards switchgear. The wall prevented auxiliary building flooding from reaching the safeguards portion of the turbine building. The pipe was located in a trench below door 8 and below the postulated auxiliary building flood height. The licensee determined that the penetration was not inspected during its review and did not have a periodic activity to inspect the penetration seal. The inspectors visually inspected the top of the seal through the trench grating and did not identify any visible gaps or openings. The licensee initiated CR424896 to further evaluate this observation and perform a detailed
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	<p>inspection of the penetration seal. The inspectors will continue to inspect this issue under IP 71111.06, "Flood Protection Measures," in the 2011 second quarter inspection period.</p> <ul style="list-style-type: none"> • RAS 105 was performed to ensure the licensee met its CLB with degraded seals on three of the doors that are credited to mitigate the effects of a seiche. The inspectors identified that the RAS accounted for leakage through the degraded door seals, but did not include other expected leakage when determining the total seiche in-leakage. The inspectors identified that additional sources of water in-leakage into the screenhouse during a seiche would include: warped trench covers, traveling water screen covers that were not in contact with their seals, and small diameter drain covers. The licensee recalculated the maximum area for leakage that could be present without degrading equipment needed to safely shutdown the plant. The additional openings identified by the inspectors did not exceed the calculated maximum. The licensee entered the observation into the CAP as CR423130. <p>The inspectors performed an independent review of the licensee's related procedures, including field walkdowns and tabletop procedure reviews. The inspectors had the following observations as a result of the inspection:</p> <ul style="list-style-type: none"> • The inspectors identified that procedure OP-KW-AOP-AFW-001, "Abnormal Auxiliary Feedwater System Operation," did not properly isolate the AFW system for a pipe rupture downstream of an AFW pump, but upstream of the isolation valves. The inspectors discussed the issue with engineering personnel who validated that water would continue to flow through a stopped pump if a break occurred before the isolation valves. Specifically, the procedure did not isolate the pump suction source to stop the flow from the CST. The licensee initiated CR424508 to correct this observation. • Procedure ARP-47054-N, "Safeguards Alley Flood Level High," Step 5(b), checked that the AFW system was intact, with a response not obtained (RNO) action of going to procedure OP-KW-AOP-FW-001. The inspectors determined that the procedure referenced in the RNO action did not exist and that the correct procedure was OP-KW-AOP-AFW-001, "Abnormal Auxiliary Feedwater System Operation." The inspectors determined that while the step was technically incorrect, checking that AFW was intact instead of checking feedwater (FW), the operators would have
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	<p>diagnosed the error and used the correct procedure. The licensee initiated CR423884 and corrected this observation immediately.</p> <ul style="list-style-type: none"> The inspectors identified that procedures ARP-47033-P, "Miscellaneous Sump Level High," and OP-KW-AOP-MDS-001, "Abnormal Operation of Miscellaneous Drains and Sumps," directed operators to open screenhouse door 182 with a rising water level in the screenhouse sump. The procedure did not consider that screenhouse in-leakage could be from a seiche (external flooding event) and that opening door 182 would make the flooding condition worse in this situation. The licensee initiated CR424517 to correct this observation.
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<p>03.04 Assess the thoroughness of the licensee's walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events possible for the site. Assess the licensee's development of any new mitigating strategies for identified vulnerabilities (e.g., entered it in to the corrective action program (CAP) and any immediate actions taken). As a minimum, the licensee should have performed walkdowns and inspections of important equipment (permanent and temporary) such as storage tanks, plant water intake structures, and fire and flood response equipment; and developed mitigating strategies to cope with the loss of that important function. Use IP 71111.21, "Component Design Basis Inspection," Appendix 3, "Component Walkdown Considerations," as a guideline to assess the thoroughness of the licensee's walkdowns and inspections.</p>	
<p>Licensee Action</p>	<p>Describe the licensee's actions to assess the potential impact of seismic events on the availability of equipment used in fire and flooding mitigation strategies.</p>
<p>a. Verify through walkdowns that all required materials are adequate and properly staged, tested, and maintained.</p>	<p>The licensee performed walkdowns and inspections of equipment utilized or required for the mitigation of fire and flood events. The licensee also assessed if the equipment was seismically qualified or whether it had been evaluated after installation as being able to survive a seismic event. The licensee also reviewed area-specific fire plans to determine which alternate equipment was available if primary fire suppression systems were lost during a seismic event.</p>

	<p>Describe inspector actions to verify equipment is available and useable. Assess whether procedures were in place and could be used as intended.</p> <p>The inspectors conducted independent walkdowns of equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during a seismic event. This equipment included, but was not limited to:</p> <ul style="list-style-type: none"> • major pieces of B.5.b contingency response equipment staged throughout the site; • portions of the fire protection system and fire suppression equipment; • the installed electric fire pumps and their controls; • credited flood doors, flood barriers, drain system check valves, and flood detection level switches throughout the plant; and • credited floor plugs, floor covers, and traveling water screen housing seals in the screenhouse structure. <p>The inspectors reviewed licensee flood and fire mitigation procedures to verify ease of use.</p> <p>Discuss general results including corrective actions by licensee. Briefly summarize any new mitigating strategies identified by the licensee as a result of its reviews.</p> <p>The licensee's inspection and walkdown of barriers, doors, and equipment used to mitigate internal flooding events did not identify any deficiencies that would prevent the equipment from mitigating the design basis internal flood event concurrent with a seismic event. The licensee confirmed that flood doors, flood barriers, and drain system check valves were designed to withstand a seismic event and would function properly. The licensee did identify that flood detection level switches were not seismically qualified and may alarm or trip the circulating pumps prematurely during a seismic event. The licensee determined that no mitigating strategies were necessary for this deficiency.</p> <p>The licensee inspected and walked down flood doors used to mitigate an external flooding event and determined that they would remain in place and function during a seismic event.</p> <p>The licensee's inspection and walkdown of important equipment needed to mitigate fire during a seismic event identified vulnerabilities. The licensee found that the majority of the fire protection system, including the carbon dioxide fire suppression system, was not designed to survive a seismic event. The licensee also identified that the administration building and the site warehouse annex, both alternate fire dress out and support areas, were not seismically qualified and may fail during a seismic event. Firefighting equipment staged to respond to B.5.b events was not stowed in seismically qualified buildings, as a seismic event and B.5.b event have never been assumed to occur coincidentally.</p>
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	<p>The licensee did not implement any new mitigating strategies for concerns related to loss of the fire main, carbon dioxide fire suppression system, or B.5.b equipment. The licensee determined that the pre-fire plans and AOP for fire adequately mitigated the losses of those systems and equipment. Specifically, the AOP directed the operators to notify the Kewaunee Fire Department that additional support was required and contained steps to drain the turbine oil reservoir and conditioner to the emergency turbine oil sump if a fire threatened the turbine oil system. The turbine oil reservoir and conditioner were the single largest fire source in the turbine building.</p> <p>The licensee did not enter any identified weaknesses that were outside of the CLB into the CAP, as they were determined to be enhancements and not conditions adverse to quality. The licensee is planning on tracking these enhancements in its self-assessment program. In addition, the licensee developed beyond design basis site equipment and modification recommendations to offset SBO and flooding vulnerabilities and to extend the four-hour coping time for SBO.</p> <p>The inspectors' independent assessment of the licensee's inspection and walkdown of important equipment needed to mitigate fire during a seismic event produced similar observations related to the deficiencies for the loss of permanent, portable, and support fire equipment during a seismic event. The inspectors had the following observations as a result of the inspection, which the licensee documented in self-assessment report SAR01500:</p> <ul style="list-style-type: none">• The inspectors identified that the relay room door to the turbine building, a fire door, may not stay closed after a seismic event, making this fire barrier ineffective. This fire door was unique, in that, ceramic pins held the door closed and were designed to break allowing the door to open if the differential pressure between the relay room and the turbine building exceeded a specified value. The inspectors found that these ceramic pins were not seismically qualified and the door may open, removing this fire barrier to the turbine building. <p>The inspectors' independent assessment of the licensee's inspection and walkdown of barriers, doors, and equipment used to mitigate internal flooding events did not identify any deficiencies that would prevent the equipment from mitigating the design basis internal flood event concurrent with a seismic event. The inspectors had the following observations as a result of the inspection, which the licensee documented in self-assessment report SAR01500:</p>
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	<ul style="list-style-type: none">• The inspectors did identify that Kewaunee’s design basis flood only required that the licensee postulate a single worst case non-seismic tank or pipe rupture in a single flood zone and that the flood barrier heights were designed for that volume of water. If more than the single worst case non-seismic tank or pipe ruptured in a single flood zone, the installed flood barriers were not adequate to mitigate the flood waters and protect equipment needed to safely shut down the reactor. <p>The inspectors’ independent assessment of the licensee’s inspection and walkdown of barriers, doors, and equipment used to mitigate external flooding events identified the following observations as a result of the inspection, which the licensee documented in self-assessment report SAR01500:</p> <ul style="list-style-type: none">• The travelling water screen housings and covers, which act as a barrier during an external flooding event, were not assessed during the licensee’s inspection and were not seismically qualified. Additionally, the inspectors also identified non-seismic 10-inch and 12-inch pipes in the lower level of the screenhouse that, if breached, would bypass the licensee’s external flood doors and barriers.
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Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. R. Simmons and other members of licensee management following the conclusion of the inspection on May 5, 2011. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Scace, Site Vice-President
R. Simmons, Plant Manager
M. Wilson, Director, Safety and Licensing
S. Yuen, Engineering Director
D. Laing, Nuclear Training Manager
D. Lawrence, Operations Manager
J. Gadzala, Licensing Engineer
R. Repshas, Licensing
T. Breene, Licensing Manager
T. Evans, Maintenance Manager

Nuclear Regulatory Commission

M. Kunowski, Chief, Division of Reactor Projects, Branch 5

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

03.01 Assess the licensee's capability to mitigate conditions that result from beyond design basis events

- CA-01; RCS Injection To Recover Core; Revision B
- CA-02; Injection Rate For Long Term Decay Heat Removal; Revision B
- CA-03; Hydrogen Flammability In Containment; Revision 3
- CA-04; Volumetric Release Rate From Vent; Revision A
- CA-05; Containment Water Level And Volume; Revision 4
- CA-06; RWST Gravity Drain; Revision A
- CA-07; Hydrogen Impact When Depressurizing Containment; Revision A
- CA085448; Create PM Procedures For The Backup Generators Listed In CR111865
- CA172201; Work With Safety And Security To ID Appropriate Tools And Safety Equipment Needed
- CA180456; CA To EP To Meet With Sec, Ops And Engineering On Long Term B.5.b Issue
- CA192374; Evaluate The Issue Proposed By NOD
- CA193142; Evaluate Audit 11-02 Resources To Support B.5.b Program Not Identified In LOAs
- CA193818; Perform A Site-Specific Review Of MPS ACE 18300
- CA195103; Correct The Note In Procedure PRP-01, Recovery Plan For Catastrophic Event
- CA195107; Determine Document And Resolve Issue Of A Referenced Procedure, ICG-009
- CA196188; Re-Establish A Process For Periodic Review Of The B.5.b Procedures
- CA196189; Enhance The Current Periodic Review Process For The SAMG Procedures
- CA196899; Prepare Operating Instructions For The Diesel Powered Pump
- CA196901; Develop A Maintenance Activity For Preventive Maintenance
- CA196902; Determine Storage Location For The Pump, Hoses, And Diesel Fuel
- CA196904; Determine The Required Number Of Suction And Discharge Hoses Based On Identification
- CA199047; I&C Training Program - Conduce Needs Assessment For B.5.b
- CA199049; Maintenance Supervisor Training Program – Conduce Needs Assessment For B.5.b
- CA199050; Electrical Maintenance Training Program – Conduct Needs Assessment For B.5.b
- CR423104; Perform Needs Assessment For B.5.b. For Selected Maintenance Training Programs
- DFC; Diagnostic Flow Chart; Revision D
- Fire Protection Agreement Between City Of Kewaunee And Kewaunee Power Station; October 18, 2010
- Letter Of Agreement Between Dominion Energy Kewaunee, Inc. And NextEra Energy Point Beach, LLC; November 4, 2010
- Letter Of Agreement Between State Of Wisconsin, Department Of Military Affairs And Dominion Energy Kewaunee, Inc.; October 4, 2009
- Letter, G. Buckley, City Of Two Rivers, To T. Coutu, KNPP; January 16, 2003

- Letter, T. Crawford, Argonne Group, Department Of Energy, To C. Steinhardt, Wisconsin Public Service Corporation; August 12, 1998
- LP EPI-01-LP001; Initial; Revision D
- LP ICC-08-LP004; Continuing Training; Revision A
- LP LRC-08-LPPRP; LRC/NAO-C; Revision B
- LP LRC-10-LP507; Cycle 10-05; Revision A
- LP R-04-06-LP022; Physical Recovery Plan For Catastrophic Event PRP-01; Revision C
- LP R-04-06-SED22; RO/SRO-TP; Revision C
- PO 70163875; Pooled Equipment Inventory Co Re: Pooled Inventory Management Services; January 8, 2007
- PO 70196822; E H Wolf & Sons Inc. Re: Diesel Fuel Services; April 17, 2009
- SACRG-01; Severe Accident Control Room Guideline – Initial Response; Revision 8
- SACRG-02; Severe Accident Control Room Guideline – After TSC Is Functional; Revision 4
- SAEG-01; TSC Long Term Monitoring; Revision C
- SAG-01; Feed The Steam Generator; Revision 11
- SAG-02; Depressurize The RCS; Revision C
- SAG-03; Inject Into The RCS; Revision C
- SAG-04; Inject Into Containment; Revision C
- SAG-05; Reduce Fission Product Releases; Revision 4
- SAG-06; Control Containment Conditions; Revision C
- SAG-07; Reduce Containment Hydrogen; Revision C
- SCG-01; Mitigate Fission Product Releases; Revision C
- SCG-02; Depressurize Containment; Revision C
- SCG-03; Control Hydrogen Flammability; Revision B
- SCG-04; Control Containment Vacuum; Revision B
- SCST; Severe Challenge Status Tree; Revision D
- TR-KW-TPG-0300; Licensed Operator Requalification; Revision R
- TR-KW-TPG-0500; Nuclear Auxiliary Operator; Revision J
- UG-01; SAMG Users Guide; Revision B
- OP-KW-AOP-GEN-003, Security Threat, Revision 5

03.02 Assess the licensee's capability to mitigate station blackout (SBO) conditions

- BKG ECA-0.0; Loss Of All AC Power; Revision 9
- CA145251; Revised Calc Results In Operations Procedure Change
- Calc. 404; Kewaunee Tank Level EOP Setpoints; Revision 0
- Calc. C10859-3; Condensate Storage Tank, EOP Switchover To Alternate Water Source, Setpoint; Revision 1, December 16, 2010
- Calc. C10859-3; Condensate Storage Tank, EOP Switchover To Alternate Water Source, Setpoint; Revision 1, March 12, 2005
- Calc. C10859-4; Condensate Storage Tank Level, Tech Spec Minimum Volume Requirement; Revision 2, August 25, 2005
- Calc. C10918; Condensate Storage Tank Level Required To Meet T.S. 3.4.C; Revision 2, April 19, 2003
- Calc. C11923; Critical Submergence For The Condensate Storage Tanks At Kewaunee Power Station; Revision 1, November 2, 2010
- Drawing Operation-M-213-2; Flow Diagram Station And Instrument Air System; Revision B-1
- Drawing Operation-M-213-5; Flow Diagram Station And Instrument Air System; Revision A-1

- ECA-0.0; Loss Of All AC Power; Revision 44
- Letter, A. Hansen, NRC To C.A. Schrock, Wisconsin Public Service Corporation, Re: Kewaunee Nuclear Power Plant, Unit No. 1 – Station Blackout Rule (10 CFR 50.63) (TAC No. M84521); November 19, 1992
- Letter, A. Hansen, NRC To K. Evers, Wisconsin Public Service Corporation, Re: Supplemental Safety Evaluation Of The Kewaunee Nuclear Power Plant, Response To The Station Blackout Rule (TAC No. 68558); October 1, 1991
- Letter, M. Davis, NRC, To K. Evers, Wisconsin Public Service Corporation, Re: Safety Evaluation Of The Kewaunee Nuclear Power Plant Response To The Station Blackout Rule (TAC No. 68558); November 20, 1990
- Letter, M. Davis, NRC, To K. Evers, Wisconsin Public Service Corporation, Re: Evaluation Of Station Blackout Due To High Winds At Kewaunee (TAC No. 68558); April 4, 1990
- Memorandum, NRC To Wisconsin Public Service Corporation, Re: Station Blackout, Meeting On September 1, 1992; September 30, 1992
- NRC-04-012, 10 CFR 50.90; Correspondence, NMC To NRC; Re: Responses To NRC Clarification Questions On Responses To Requests For Additional Information Regarding License Amendment Request 195, Stretch Power Uprate For Kewaunee Nuclear Power Plant (TAC No. MB9031); January 30, 2004
- NRC-89-139; Letter, K. Evers, Wisconsin Public Service Corporation, To NRC, Re: Station Blackout Weather Data; November 14, 1989
- NRC-89-46; Letter, C. Steinhardt, Wisconsin Public Service Corporation, To NRC, Re: Generic Response To Station Blackout Rule For Plants Using Alternate AC Power; April 17, 1989
- NRC-90-39; Letter, K. Evers, Wisconsin Public Service Corporation, To NRC, Re: Station Blackout (SCO) Supplement Response; March 30, 1990
- NRC-91-002; Letter, K. Evers, Wisconsin Public Service Corporation, To NRC, Re: Station Blackout; January 8, 1991
- NRC-91-029; Letter, K. Evers, Wisconsin Public Service Corporation, To NRC, Re: Response To Station Blackout SE; March 1, 1991
- NRC-92-125; Letter, C.A. Schrock, Wisconsin Public Service Corporation, To NRC, Re: Station Blackout Response; September 18, 1992
- NRC-93-011; Letter, C.A. Schrock, Wisconsin Public Service Corporation, To NRC, Re: Station Blackout Response; January 19, 1993
- NRC-93-154; Letter, C.A. Schrock, Wisconsin Public Service Corporation, To NRC, Re: Station Blackout (SBO) Closeout Letter; October 25, 1993
- NUMARC 87-00; Guidelines And Technical Bases For NUMARC Initiatives Addressing Station Blackout At Light Water Reactors; Revision 1, August 1991
- OP-KW-AOP-AFW-001; Abnormal Auxiliary Feedwater System Operation; Revision 3
- OP-KW-AOP-RHR-001; Abnormal Residual Heat Removal System Operation, System RHR-34; Revision 5
- OP-KW-NOP-SUB-002; Restoration Of Off-Site Power; Revision 6
- OP-KW-ORT-SAE-001; Control Room/Dedicated Shutdown System Emergency Equipment Inventory; March 28, 2010
- SDBD-KPS-AFW; Auxiliary Feedwater System; Revision 03
- SP-87-125; Shift Instrument Channel Checks – Mode 1-4; February 11, 2011
- Time Critical Operator Actions; April 14, 2011
- Westinghouse Proprietary Class 2C, Section 4.2-7
- WPSC, Summary Of Station Blackout Response Submittal; August 7, 1992

03.03 Assess the licensee's capability to mitigate internal and external flooding events required by station design

- Drawing A-203; General Arrangement Turbine And Administration Building Basement Floor; Revision BG
- Drawing A-204; General Arrangement Reactor And Auxiliary Building Basement Floor; Revision BR
- Drawing A-205; General Arrangement Turbine And Administration Building Mezzanine Floor; Revision AU
- Drawing A-206; General Arrangement Reactor And Auxiliary Building Mezzanine Floor; Revision BZ
- Drawing A-528-1; Flood Boundary; Revision F
- Drawing A-528-2; Flood Boundary Revision C
- Drawing MS-02-07; Service Water; Revision D
- Drawing MS-02-558; Service Water; Revision A
- Drawing OPERM-205; Flow Diagram Feedwater System; Revision BL
- Drawing S-508; Administration Building Foundation Plan & Floor Drains; Revision R
- ICP-04-22; Turbine Building Level Switches To Circulating Water Pump Trip Functional Test; March 11, 2011
- MA-KW-MPM-MDS-001; Inspection Of Flood Protection Floor Drain Check Valves; March 6, 2011
- OP-KW-AOP-AFW-001; Abnormal Auxiliary Feedwater System Operation, System AFW-05B; Revision 3
- OP-KW-AOP-CC-001; Abnormal Component Cooling Operation; System CC-31; Revision 5
- OP-KW-AOP-GEN-004; Response To Natural Events; Revision 10
- OP-KW-AOP-MDS-001; Abnormal Operation Of Miscellaneous Drains And Sumps, System MDS-30; Revision 4
- OP-KW-AOP-RD-001; Reactor Coolant Leak, System RC-36; Revision 4
- OP-KW-AOP-SW-001; Abnormal Service Water System Operation, System SW-02; Revision 7
- OP-KW-ARP-47032-Q; RHR Pump Pit A/B Level High, System MDS-30; Revision 1
- OP-KW-ARP-47032-R; RHR Pump pit Sump Level High, System MDS-30; Revision 0
- OP-KW-ARP-47033-P; Miscellaneous Sump Level High, System MDS-30; Revision 0
- OP-KW-ARP-47033-R; Aux Bldg Flood Level High, System MDS-30; Revision 3
- OP-KW-ARP-47051-N; CW Pumps Flood Level Trip, System CW-04; Revision 1
- OP-KW-ARP-47051-Q; Turbine Building Service Water Isolation, System SW-02; Revision 1
- OP-KW-ARP-47052-N; Turbine Bldg Flood Level Alert, System CW-04; Revision 0
- OP-KW-ARP-47053-N; Cond Trench Water Level High, System CW-04; Revision 0
- OP-KW-ARP-47054-N; SFGRD Alley Flood Level High, System MDS-30; Revision 1
- Report No. SW-02-19(App.C); Dynamic Seismic Analysis; March 30, 1990
- WO KW100276096; PM30-547: Inspect Valve Internals; June 11, 2010
- WO KW100280620; PM30-548: Inspect Valve Internals; June 11, 2010
- WO KW100474718; PM89A055: Inspect Flood Barriers; November 17, 2009
- WO KW100576053; PM08-805: Inspection Of Doors On Elevation 569 And 586; August 10, 2010
- WO KW100593929; PM30-543: Inspect Valve Internals; October 22, 2010
- WO KW100593989; PM30-542: Inspect Valve Internals; October 22, 2010
- WO KW100596190; PM30-552: Inspect Valve Internals; March 11, 2011
- WO KW100596331; PM30-544: Inspect Valve Internals; October 22, 2010

- WO KW100598634; PM04-582: Turbine Bldg CW Pump Functional Test; March 15, 2011
- WO KW100599448; PM30-553: Inspect Valve Internals; October 22, 2010
- WO KW100768370; PM89A067: Inspect/Functional Check (Monthly) SPV Doors; March 9, 2011

03.04 Assess the thoroughness of the licensee's walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events

- Drawing A-528-1; Flood Boundary; Revision F
- Drawing A-528-2; Flood Boundary Revision C
- Drawing OPERM-208-1; Flow Diagram Fire Protection System; Revision E
- Drawing OPERM-384; Flow Diagram CO2 Fire Protection System; Revision S
- OP-KW-AOP-FP-001; Abnormal Operating Procedure – Fire; Revision 5
- OP-KW-ARP-47054-L; Fire Pumps Abnormal; Revision 0

Licensee-Identified Condition Reports

- CR417934; IER L1-11-1, Fukushima Daiichi Nuclear Station Fuel Damage Caused By Earthquake
- CR418203; Test Run B.5.b Pump, Pump Water From Lake Michigan
- CR418213; PRP-01 Physical Recovery Plan Discrepancy
- CR418232; Inventory And Test Available Equipment For B.5.b. In ICG-009
- CR418246; B.5.b. Program Lists ICG-009 As A Procedure
- CR418373; Load Test B.5.b. Battery Charger
- CR418424; Procedure Enhancements Needed Following Walkdown Of SACRG-01
- CR418429; Procedure Enhancements Needed Following Walkdown Of SACRG-02
- CR418439; Procedure Enhancements/Evaluations Requested Following Walkdown Of SAG-04 Inject
- CR418444; Procedural Enhancements To SAMG SAG-01, Feed The Steam Generators
- CR418446; SCG-03, Containment Hydrogen Flammability, References Out Of Date Design Materials
- CR418449; Discrepancies Encountered During Procedure Walkdown Of SAMG SAG-01, Feed The SG
- CR418466; Procedure Enhancements To SAMG SAG-03, Inject Into The RCS
- CR418583; Issues Identified During The Walkdown Of PRP-01 For INPO IER 11-1
- CR418597; RPKW-003-004 Not Revised After TLD Process Change
- CR418599; Issue Identified In PRP-01 Walkdown, Adapter Needed
- CR418613; Enhancements To PRP-02 IER 11-1
- CR418615; Enhancements To PRP-03 IER 11-1
- CR418618; Procedure Enhancements/Evaluations Requested For SAG-05 IER 11-1
- CR419669; Currently There Is No Periodic Review Of B.5.b. Procedures
- CR419676; Currently There Is Inadequate Periodic Review Of SAMG Procedures
- CR419677; Evaluate For Potential Training Solution Hydrogen Recombiner SAMG SAG-07
- CR420149; INPO IER 11-1 Identified Flooding Vulnerability
- CR420233; Loose Brick Tiles On Turbine Bldg. Roof
- CR420602; No PM Task For Safeguard Alley Watchdog Sump Pump System
- CR421003; KPS Emergency Plan Enhancement

- CR421431; IER 11-1 Walkdown H2 Seal Oil Fire System – Minor Corrosion (3 Locations)
- CR423130; NRC Questions On RAS000105 Assumptions Following Walkdown

NRC-Identified Condition Reports

- CR423104; Perform Needs Assessment For B.5.b. For Selected Maintenance Training Programs
- CR423130; NRC Questions On RAS000105 Assumptions Following Walkdown
- CR423711; RFT – SAMG Training For Non-Licensed Operators
- CR423733; Evaluate Addition Of SAMG Training To NAO Training Program
- CR423884; Incorrect Procedure Referenced In OP-KW-ARP-47054-N
- CR424488; SBO/TSC Diesel – Ability To Withstand Effects Of Likely Weather Related Events
- CR424508; NRC-Identified Improvements To Procedure AOP-AFW-001
- CR424517; NRC-Inspector Identified: ARP 47033 P Possible Improvement
- CR424681; Ownership Of SACRG-1 And SACRG-2
- CR424708; Identification Of Previously Unanalyzed Flooding Source
- CR424852; NRC Prompt – SW Isolation Valves Not On SACRG-1 Attachment A
- CR424855; NRC Prompt – SAMG Procedures Lack Detail
- CR424858; NRC Prompt – B.5.b. Procedures Lack Sufficient Detail
- CR424864; NRC Prompt - SACRG-2 Additional Component Evaluation
- CR424865; NRC Prompt – SAMG Procedure Step To Order Hydrogen Recombiner
- CR424866; NRC Prompt – SAMG Procedures Lack B.5.b. Strategies
- CR424870; NRC Prompt – ERO Training Lacks Training On B.5.b. Procedures
- CR424896; Trench Barrier Not Inspected
- CR425083; Access Route For Portable Diesel Pump Not Fully Paved
- CR425092; NRC-Identified – No Clear Direction To Obtain Hydrogen Recombiners
- CR425383; NRC Questions Absence Of SAMG Training In Maintenance Training Program RFT
- CR425608; NRC Prompt – Deficiencies In Memorandums Of Understanding
- CR425961; Procedure PRP-02 Revision May Have Introduced Error Trap
- CR425962; Enhancement Recommended To Agreement With Point Beach Nuclear Plant
- SAR01500; NRC-Identified Beyond Design Basis Issues

LIST OF ACRONYMS USED

AAC	Alternate Alternating Current
ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary Feedwater
AOP	Abnormal Operating Procedure
CAP	Corrective Action Program
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CLB	Current Licensing Basis
CR	Condition Report
CST	Condensate Storage Tank
EDG	Emergency Diesel Generator
ERO	Emergency Response Organization
IP	Inspection Procedure
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records System
RAS	Reasonable Assurance Of Safety
RNO	Response Not Obtained
SACRG	Severe Accident Control Room Guideline
SAMG	Severe Accident Management Guideline
SBO	Station Blackout
SSC	System, Structure, And Component
SW	Service Water
TI	Temporary Instruction
TSC	Technical Support Center
URI	Unresolved Item

D. Heacock

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Sincerely,

/RA/

Michael A. Kunowski, Chief
Branch 5
Division of Reactor Projects

Docket No. 50-305
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