Entergy

Entergy Nuclear Operations, Inc.
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Michael A. Balduzzi
Site Vice President

April 3, 2006

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
11555 Rockville Pike
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SUBJECT: Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
Docket No. 50-293
License No. DPR-35

Response to Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power

LETTER NUMBER: 2.06.023

REFERENCE (1): NRC Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power, dated February 1, 2006

Dear Sir or Madam:

By Reference 1, the NRC requested information under the requirements of 10 CFR 50.54(f) for determining compliance with regulatory requirements governing electric power sources.

The enclosure to this letter provides the response to Generic Letter 2006-02 for Pilgrim Station and is provided under the requirements of 10 CFR 50.54(f).

Generic Letter 2006-02 discusses compliance with General Design Criterion (GDC) 17 in several locations. It should be noted that Pilgrim Station was in the construction stage when the GDCs were published for comment and Pilgrim was reviewed to the applicable draft GDC. The comparison of Pilgrim Station to the GDC is described in the Pilgrim Station Updated Final Safety Analysis Report (UFSAR). Applicable responses contained in Attachment 1 are provided based on information included in the UFSAR and NRC safety evaluation reports.

Some of the questions in Generic Letter 2006-02 seek information about analyses, procedures, and activities concerning grid reliability based on interfaces with TSO, for which Entergy Nuclear Operations (ENO) does not have first-hand knowledge. ENO has included information provided by the ISO-NE and NSTAR Electric Company, as described in the responses. ENO has not independently verified all information by ISO-NE or NSTAR, and makes no representation as to its accuracy or completeness.

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This letter contains no commitments.

Please feel free to contact Bryan Ford, (508) 830-8403, if you have any questions regarding this subject.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 3, 2006.

Sincerely,

R. F. Smith for MAB

Michael A. Balduzzi
Site Vice President

WGL/dm

Enclosure: Response to Generic Letter 2006-02 for Pilgrim Station

cc: (with Enclosure)

cc: Mr. Samuel J. Collins
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ENCLOSURE

Response to Generic Letter 2006-02
for Pilgrim Nuclear Power Station

GL 2006-02	Response for Pilgrim Station
Use of protocols between the NPP licensee and the TSO, ISO, or RC/RA and the use of analysis tools by TSOs to assist NPP licensee in monitoring grid conditions to determine the operability of off-site power systems under plant Technical Specifications. 10 CFR Part 50 Appendix A GDC 17 requires that licensees minimize the probability of the loss of power from the transmission network given a loss of the power generated by the nuclear power unit(s).	
1. Use of protocols between the NPP licensee and the TSO, ISO, or RC/RA to assist the NPP licensee in monitoring grid conditions to determine the operability of off-site power systems under plant Technical Specifications.	
1.(a) Do you have a formal agreement or protocol with your TSO?	Response: Yes. For Pilgrim Nuclear Power Station (Pilgrim), the TSO is ISO-New England (ISO-NE), which is the regional transmission operator and its local control centers (LCC), which provide for the monitoring of grid conditions to determine the operability of the 345kV off-site power systems ("preferred AC off-site power source"). The Transmission Owner (TO) for Pilgrim is NSTAR, a Boston, MA based electric utility. Pilgrim has formal agreements with the Transmission Owner (TO) (Interconnection Agreement) and TSO (Market Participant Service Agreement). The TO and TSO agreements require all parties to operate per ISO-NE procedures and documents; therefore, the ISO-NE procedures and documents are considered part of the formal agreements. The Pilgrim 23kV distribution line is not controlled by ISO-NE. NSTAR is the owner/operator of the 23kV distribution line. The 23kV source provides a "secondary power source" of off-site power to the emergency service portion of the auxiliary power distribution system. Pilgrim has a formal "Agreement for Emergency Backup Service" with the owner/operator of the 23kV distribution line.

GL 2006-02	Response for Pilgrim Station
1.(b) Describe any grid conditions that would trigger a notification from the TSO to the NPP licensee and if there is a time period required for the notification	Response: TSO makes notifications as soon as practical per good utility practice upon identification of any of the following: 1) Overall system wide warning or alert conditions. 2) If the computerized contingency monitoring program (Real-Time Contingency Analysis) determines that the 345kV post-trip off-site voltage could degrade below a value specified by Pilgrim. 3) In the event that Local Control Center and ISO-NE Control Center Real-time On-line AC Contingency Monitor Programs become unavailable. 4) A local system configuration, which would cause Pilgrim to become unstable in the event of a potential transmission system contingency. There are no formal notification protocols where the owner/operator of the 23kV distribution system is required to notify Pilgrim of a degraded 23kV system voltage condition.

GL 2006-02	Response for Pilgrim Station
1.(c) Describe any grid conditions that would cause the NPP licensee to contact the TSO. Describe the procedures associated with such a communication. If you do not have procedures, describe how you assess grid conditions that may cause the NPP licensee to contact the TSO.	Response: Grid conditions and status are the primary responsibility of the TSO. The observable parameters at Pilgrim include voltage and frequency, generator reactive output, breaker status, line status, and certain switchyard alarm points. Pilgrim would notify the TSO of abnormal observed parameters. Relative to this question, "grid conditions" is assumed to be Pilgrim changes that impact the TSO real-time post contingency analysis capability. Pilgrim typically notifies the TSO of changes in the following conditions: • Power up rate • Modifications resulting in changes to generator electrical characteristics • Post-trip off-site voltage criteria • Changes in Pilgrim's post trip station or accident loading Pilgrim does not have any equipment which is required to provide post-trip off-site voltage support. Pilgrim contacts the owner/operator of the 23kV distribution system upon complete loss of the 23kV supply to Pilgrim.

GL 2006-02	Response for Pilgrim Station
1.(d) Describe how NPP operators are trained and tested on the use of the procedures or assessing grid conditions in question 1(c).	Response: Pilgrim's operators are trained (class room and simulator) and tested on procedure usage on the following topics: • LOOP Events (Loss of Off-Site Power) • Restoration of Off-Site Power • Degraded voltage conditions and voltage limitations to assure design criteria are met • TSO / Pilgrim interface protocols • Theory of grid operations • Notifications to ISO-NE of changed conditions.

GL 2006-02	Response for Pilgrim Station
1.(e) If you do not have a formal agreement or protocol with your TSO, describe why you believe you continue to comply with the provisions of GDC 17 as stated above, or describe what actions you intend to take to assure compliance with GDC 17.	Response: Pilgrim does have a formal agreement with ISO-NE, and the TO as discussed above for the 345kV transmission lines, which is the preferred off-site power source; thus, this question is not applicable. In addition to the Preferred AC off-site power source consisting of two electrically independent 345kV transmission lines and the Pilgrim Startup Transformer, Pilgrim has a secondary power source (Shutdown Transformer) as defined in section 8.3 of the Pilgrim Station FSAR. This secondary power source is a 23kV distribution line, which is fed from 23kV Line 72 from the local electricity provider's (NSTAR) 23kV distribution system. The source of power for NSTAR Line 72 is the NSTAR Manomet substation. The Manomet substation includes a transformer with an automatic load tap changer which supplies Line 72. The Manomet substation is supplied power from the NSTAR 115kV line 108 or 115kV line 113. The Pilgrim Shutdown Transformer transforms the 23kV to 4kV and feeds either safety related 4kV bus and is the backup to the Pilgrim onsite emergency power system (safety related emergency diesel generators). Upon loss of preferred AC off-site power source and a failure of either one of the Pilgrim emergency diesel generators (EDGs), its respective safety related bus will be automatically supplied from the Shutdown Transformer. The 4kV output of the Shutdown Transformer is continuously monitored and indicated in two places in the Control Room. One indication is located on Control Panel C3 which is the electrical section of the Main Control Board. The remaining indication is the Generator and Electrical System Panel C8. Additionally, a loss of 4kV voltage on the secondary side of the Shutdown Transformer is annunciated on the Main Control Room Alarm System. The agreement Pilgrim has with the owner/operator of the 23kV distribution system provides adequate assurance of compliance with the Pilgrim licensing basis.

GL 2006-02	Response for Pilgrim Station
1.(f) If you have an existing formal interconnection agreement or protocol that ensures adequate communication and coordination between the NPP licensee and the TSO, describe whether this agreement or protocol requires that you be promptly notified when the conditions of the surrounding grid could result in degraded voltage (i.e., below TS nominal trip setpoint value requirements; including NPP licensees using allowable value in its TSs) or LOOP after a trip of the reactor unit(s).	Response: As previously stated, Pilgrim does have a formal agreement with ISO-NE. These agreements require the TSO to notify Pilgrim as soon as practicable per good utility practice, upon identification of potential post-trip degraded voltage. The 23kV distribution is a secondary power source as discussed previously and 23kV distribution is not impacted by a trip of the reactor. The 23kV source is only used when the preferred source and either emergency diesel generator have failed.

GL 2006-02	Response for Pilgrim Station
1.(g) Describe the low switchyard voltage conditions that would initiate operation of plant degraded voltage protection.	Response: The degraded voltage relays at the startup transformer actuate approximately at 93% of 4.16kV (Technical Specification 3.2.B) after a time delay. These relays perform the following: • Trip SUT breaker/s • Start EDG when UAT and SUT breakers are open • Initiate Load Shed logic with LOCA signal present • Miscellaneous Alarm function. Additionally, degraded voltage protection is provided to monitor the preferred off-site power (startup transformer), the 4.16kV safety buses A5 and A6, and 480V safety buses B1 and B2. The degraded voltage relays actuate approximately at 95% of 4.16kV (Technical Specification 3.2.B) after 10 second delay and provide an alarm function. Once an alarm(s) is received, operator action will be entered to start the onsite emergency power system (EDGs). Also, with an LOCA signal present, the degraded voltage relays actuate the Load Shed logic. The 23kV distribution line is not affected by the low switchyard voltage conditions as it does not interface or interconnect with the 345kV switchyard.

GL-2006-02	Response for Pilgrim Station
2. Use of criteria and methodologies to assess whether the off-site power system will become inoperable as a result of a trip of your NPP.	
2.(a) Does your NPP's TSO use any analysis tools, an online analytical transmission system studies program, or other equivalent predictive methods to determine the grid conditions that would make the NPP off-site power system inoperable during various contingencies? If available to you, please provide a brief description of the analysis tool that is used by the TSO.	Response: Yes. The LCCs employ Real-Time Contingency Analysis Program. The program and related actions are summarized as follows. The Program utilizes real-time transmission system information and Pilgrim unit specific shutdown loads and minimum voltage requirements. The program creates a real-time network model starting with bus/branch connectivity, branch impedances and ratings, and steady state generator models. The program then superimposes real-time switch and breaker status to determine network topology. Real-time generation and bus loads are also applied to this model. Statistical techniques are used to resolve tele-metering inconsistencies. The result forms the basis upon which contingent events (contingencies) are tested. A pre-defined list of contingencies includes loss of each generator (including Pilgrim) and transmission events. The LCC contingency results are automatically compared to limits; if the Pilgrim trip contingency violates the Pilgrim post trip voltage limit, alarms are generated and Pilgrim would be notified. The ISO-NE Real-Time Contingency Analysis Program would be used upon loss of the LCC capability. The ISO-NE program operates similar to the LCC except the Pilgrim contingency is the trip of the unit only. The owner/operator of the 23kV distribution system does not have an on-line contingency analysis tool to monitor the 23kV system. The owner/operator of the 23kV distribution system performs annual three year load projection studies to determine the capability of the 23kV system, which includes the supply to Pilgrim. These studies provide assurance that the 23kV off-site source is adequate under normal system conditions.

GL 2006-02	Response for Pilgrim Station
2.(b) Does your NPP's TSO use an analysis tool as the basis for notifying the NPP licensee when such a condition is identified? If not, how does the TSO determine if conditions on the grid warrant NPP licensee notification?	Response: Yes. As discussed above, the TSO uses a real-time analysis tool to notify Pilgrim of abnormal 345kV grid conditions. The owner/operator of the 23kV distribution system performs annual three year load projection studies to determine the capability of the 23kV system, which includes the supply to Pilgrim. The owner/operator of the 23kV distribution system is not formally required to notify Pilgrim if the 23kV supply to Pilgrim decreases to below the 95% of 23kV minimum voltage limit. It must be noted that the normal scheduled voltage of the 23kV supply is $\pm$ 5% at the point of delivery. The voltage is allowed to decrease to 90% only under emergency operation conditions.
2.(c) If your TSO uses an analysis tool, would the analysis tool identify a condition in which a trip of the NPP would result in switchyard voltages (immediate and/or long-term) falling below TS nominal trip setpoint value requirements (including NPP licensees using allowable value in its TSs) and consequent actuation of plant degraded voltage protection? If not, discuss how such a condition would be identified on the grid.	Response: Yes. The TSO real-time analysis tool, in conjunction with Pilgrim load flow studies, has the capability to determine if the trip of Pilgrim would result in a post-trip off-site voltage which would actuate the Pilgrim degraded voltage protection logic and initiate separation from an off-site power source upon a Pilgrim trip. The 23kV distribution system is not affected by the tripping of the NPP.

GL 2006-02	Response for Pilgrim Station
2.(d) If your TSO uses an analysis tool, how frequently does the analysis tool program update?	Response: The TSO real-time analysis tool calculations are performed for the 345kV system every 5 minutes at ISO-NE and the Pilgrim associated LCC. In addition, real-time system interface limit calculations are performed every 30 seconds by ISO-NE.
2.(e) Provide details of analysis tool-identified contingency conditions that would trigger an NPP licensee notification from the TSO.	Response: Yes. The LCCs employ Real-Time Contingency Analysis Program. The program and related actions are summarized as follows. The Program utilizes real-time transmission system information and Pilgrim unit specific shutdown loads and minimum voltage requirements. The program creates a real-time network model starting with bus/branch connectivity, branch impedances and ratings, and steady state generator models. The program then superimposes real-time switch and breaker status to determine network topology. Real-time generation and bus loads are also applied to this model. Statistical techniques are used to resolve tele-metering inconsistencies. The result forms the basis upon which contingent events (contingencies) are tested. A pre-defined list of contingencies includes loss of each generator (including Pilgrim trip and transfer of accident and house loads) and transmission events (loss of lines). Contingency results are automatically compared to limits; if the Pilgrim trip contingency violates the Pilgrim post trip voltage limit, alarms are generated and Pilgrim would be notified. The ISO-NE Real-Time Contingency Analysis Program would be used upon loss of the LCC capability. The ISO-NE program operates similar to the LCC except the Pilgrim contingency is the trip of the unit only. The owner/operator of the 23kV distribution system does not have an on-line contingency analysis tool to monitor the 23kV system. The owner/operator of the 23kV distribution system performs annual three year load projection studies to determine the capability of the 23kV system, which includes the supply to Pilgrim. These studies provide assurance that the 23kV off-site source is adequate under normal and certain stressed system conditions to address all possible contingencies. For 23kV, the owner/operator of the 23kV distribution system would notify the Pilgrim if the annual studies identify a voltage support issue related to the 23kV distribution line.

GL 2006-02	Response for Pilgrim Station
2.(f) If an interface agreement exists between the TSO and the NPP licensee, does it require that the NPP licensee be notified of periods when the TSO is unable to determine if off-site power voltage and capacity could be inadequate? If so, how does the NPP licensee determine that the off-site power would remain operable when such a notification is received?	Response: Yes. For 345kV, ISO-NE has an Operating Procedure which requires the TSO to notify Pilgrim if the TSO's ability to predict the adequacy of post-trip off-site voltage is unavailable. Loss of voltage prediction tools alone has no impact on operability. An impact on operability is considered unlikely because: (i) this analysis capability exists at multiple TSO locations and (ii) there are multiple methods to determine off-site voltage adequacy both automatic real-time and system operator manual analysis. If TSO had previously determined the grid was in a degraded or stressed condition (i.e., notified Pilgrim) and/or if the TSO, based on changing system conditions and their operating experience, determine that a stressed condition has developed during the loss of voltage prediction tools, Pilgrim will be notified and the impact on operability would be considered. For 23kV, the owner/operator of the 23kV distribution system does not employ a real-time automatic and manual system analysis tool for the 23kV distribution line.
2.(g) After an unscheduled inadvertent trip of the NPP, are the resultant switchyard voltages verified by procedure to be bounded by the voltages predicted by the analysis tool?	Response: No. Neither Pilgrim nor the TSO validate the real-time analysis tool predicted post-trip voltage value against the actual voltage.
2.(h) If an analysis tool is not available to the NPP licensee's TSO, do you know if there are any plans for the TSO to obtain one? If so, when?	Response: This question is not applicable for Pilgrim's 345kV source. The TSO has real-time analysis tool as discussed above presently in use for the 345kV system. There is no analysis tool for the 23kV system, as it is a distribution line verses a transmission system and is a secondary power source. There are no plans to utilize an on-line analysis tool or program.

GL 2006-02	Response for Pilgrim Station
2.(i) If an analysis tool is not available, does your TSO perform periodic studies to verify that adequate off-site power capability, including adequate NPP post-trip switchyard voltages (immediate and/or long-term), will be available to the NPP licensee over the projected timeframe of the study?	Response: For the 345kV source, TSO uses a real-time analysis tool as discussed above. For the 23kV distribution line, the owner/operator of the 23kV distribution system performs annual three-year load projection studies to determine the capability of the 23kV system, which provides secondary power to Pilgrim. These studies are static system studies.
2.(i)(a) Are the key assumptions and parameters of these periodic studies translated into TSO guidance to ensure that the transmission system is operated within the bounds of the analyses?	Not applicable for the 345kV source. For 23kV, the owner/operator of the 23kV distribution system performs annual three year load projection studies to determine the capability of the 23kV system, which includes the supply to Pilgrim. The normal scheduled voltage of the 23kV supply is $\pm$ 5% at the point of delivery based on these studies.
2.(i)(b) If the bounds of the analyses are exceeded, does this condition trigger the notification provisions discussed in question 1 above?	Not applicable for the 345kV source. For 23kV, the owner/operator of the 23kV distribution system would notify the Pilgrim if the annual studies identify a voltage support issue related to the 23kV distribution line.

GL 2006-02	Response for Pilgrim Station
2.(j) If your TSO does not use, or you do not have access to the results of an analysis tool, or your TSO does not perform and make available to you periodic studies that determine the adequacy of off-site power capability, please describe why you believe you comply with the provisions of GDC 17 as stated above, or describe what compensatory actions you intend to take to ensure that the off-site power system will be sufficiently reliable and remain operable with high probability following a trip of your NPP.	Response: For 345kV, the TSO has a real-time analysis tool and provides the results to Pilgrim. For 23kV, the owner/operator of the 23kV distribution system performs static system studies as part of annual three-year load projection studies and Pilgrim has access to the results.

GL 2006-02	Response for Pilgrim Station
3. Use of criteria and methodologies to assess whether the NPP's off-site power system and safety-related components will remain operable when switchyard voltages are inadequate.	
3.(a) If the TSO notifies the NPP operator that • a trip of the NPP, or • the loss of the most critical transmission line or • the largest supply to the grid would result in switchyard voltages (immediate and/or long-term) below TS nominal trip setpoint value requirements (including NPP licensees using allowable value in its TSs) and would actuate plant degraded voltage protection, is the NPP off-site power system declared inoperable under the plant TSs? If not, why not?	Response: Yes. Pilgrim would declare the 345kV off-site source "inoperable". The TSO has real-time monitor capability for the 345kV source and Pilgrim is notified by the TSO if the loss of the unit would result in an unacceptable off-site post-trip voltage. There are no identified system conditions where the loss of a transmission line or large supply would result in the trip of the generator. Not applicable for 23kV distribution line.

GL 2006-02	Response for Pilgrim Station
3.(b) If onsite safety-related equipment (e.g., emergency diesel generators or safety-related motors) is lost when subjected to a double sequencing (LOCA with delayed LOOP event) as a result of the anticipated system performance and is incapable of performing its safety functions as a result of responding to an emergency actuation signal during this condition, is the equipment considered inoperable? If not, why not?	Response: Yes. If onsite safety related equipment is actually lost (as governed by plant Technical Specifications), then the equipment is declared inoperable. Double sequencing is not in Pilgrim's licensing basis and Pilgrim is not designed or analyzed for double sequencing scenarios.
3.(c) Describe your evaluation of onsite safety-related equipment to determine whether it will operate as designed during the condition described in question 3(b).	Response: Not applicable. See response to question 3(b).
3.(d) If the NPP licensee is notified by the TSO of other grid conditions that may impair the capability or availability of off-site power, are any plant TS action statements entered? If so, please identify them.	Response: Yes. Technical Specification 3.9.B provides requirements for the operability of power supplies during plant operation.

GL 2006-02	Response for Pilgrim Station
3.(e) If you believe your plant TSs do not require you to declare your off-site power system or safety-related equipment inoperable in any of these circumstances, explain why you believe you comply with the provisions of GDC 17 and your plant TSs, or describe what compensatory actions you intend to take to ensure that the off-site power system and safety-related components will remain operable when switchyard voltages are inadequate.	Response: Not applicable.
3.(f) Describe if and how NPP operators are trained and tested on the compensatory actions mentioned in your answers to questions 3(a) through (e).	Response: Pilgrim operators are trained (class room and simulator) and tested in applicable degraded voltage operating and plant procedures as part of the initial and requalification training programs.

GL 2006-02	Response for Pilgrim Station
4. Use of criteria and methodologies to assess whether the off-site power system will remain operable following a trip of your NPP.	
4.(a) Do the NPP operators have any guidance or procedures in plant TS bases sections, the final safety analysis report, or plant procedures regarding situations in which the condition of plant-controlled or -monitored equipment (e.g., voltage regulators, auto tap changing transformers, capacitors, static VAR compensators, main generator voltage regulators) can adversely affect the operability of the NPP off-site power system? If so, describe how the operators are trained and tested on the guidance and procedures.	Response: Pilgrim operating procedures, Technical Specification Bases, and the Updated Final Safety Analysis Report provide guidance on the impact of plant equipment due to degraded voltage conditions and the required operator actions in accordance with plant Technical Specifications. Plant procedures also address control and monitoring of the main generator output and voltage regulator to support plant and grid conditions. Pilgrim does not have auto tap changing transformers, capacitors, and static VAR compensators. The operators are trained (class room and simulator) and tested in all applicable procedures as part of the initial and requalification training programs.

GL 2006-02	Response for Pilgrim Station
4.(b) if your TS bases sections, the final safety analysis report, and plant procedures do not provide guidance regarding situations in which the condition of plant-controlled or -monitored equipment can adversely affect the operability of the NPP off-site power system, explain why you believe you comply with the provisions of GDC 17 and the plant TSs, or describe what actions you intend to take to provide such guidance or procedures.	Response: Not Applicable.

GL 2006-02	Response for Pilgrim Station
Use of NPP licensee/TSO protocols and analysis tool by TSOs to assist NPP licensees in monitoring grid conditions for consideration in maintenance risk assessments The Maintenance Rule (10 CFR 50.65(a)(4)) requires that licensees assess and manage the increase in risk that may result from proposed maintenance activities before performing them.	
5. Performance of grid reliability evaluations as part of the maintenance risk assessments required by 10 CFR 50.65(a)(4).	
5.(a) Is a quantitative or qualitative grid reliability evaluation performed at your NPP as part of the maintenance risk assessment required by 10 CFR 50.65(a)(4) before performing grid-risk-sensitive maintenance activities? This includes surveillances, post-maintenance testing, and preventive and corrective maintenance that could increase the probability of a plant trip or LOOP or impact LOOP or SBO coping capability, for example, before taking a risk-significant piece of equipment (such as an EDG, a battery, a steam-driven pump, an alternate AC power source) out-of-service?	Response: Yes. Technical Specification 5.5.7 requires the Configuration Risk Management Program, which follows the Maintenance Rule 10 CFR 50.65(a)(4) requirement, and is implemented by Pilgrim "Risk Assessment Process" procedure. The procedure requires qualitative assessment prior to removing equipment from service for planned maintenance activities, unplanned equipment failures, and after discovery of additional equipment out of service associated with a limiting condition for operation. A procedure directs the plant staff to evaluate emergent conditions including grid instability in combination with external events. The procedure explicitly requires degraded voltage conditions to be considered, and uses emerging conditions to envelop the degraded voltage conditions. The procedure directs the plant staff to run the Equipment Out Of Service program to develop risk profiles when performing risk-sensitive planned and unplanned maintenance activities, including addressing loss of off-site power, and alternate AC sources. Periodic communications with the ISO-NE are employed as required by a procedure to ascertain the voltage conditions of the off-site power sources, which are factored in the on-going and planned maintenance activities, as a matter of routine maintenance practice.

GL 2006-02	Response for Pilgrim Station
5.(b) is grid status monitored by some means for the duration of the grid-risk-sensitive maintenance to confirm the continued validity of the risk assessment and is risk reassessed when warranted? If not, how is the risk assessed during grid-risk-sensitive maintenance?	Response: Yes. The 345kV grid status is continuously monitored by the TSO and if conditions change the TSO would notify Pilgrim. The availability and unavailability of the 23kV distribution line is indicated by the shutdown transformer voltage monitoring system.

GL 2006-02	Response for Pilgrim Station
5.(c) Is there a significant variation in the stress on the grid in the vicinity of your NPP site caused by seasonal loads or maintenance activities associated with critical transmission elements?	Response: Yes. For 345kV, based on a review of the number of times the TSO entered specific off-normal system notifications over the past 19 years, it has been determined there are seasonal and maintenance variations in grid stress.
Is there a seasonal variation (or the potential for a seasonal variation) in the LOOP frequency in the local transmission region? If the answer to either question is yes, discuss the time of year when the variations occur and their magnitude.	Yes. Electric Power Research Institute (EPRI) Technical Report 1011759 Frequency Determination Method for Cascading Grid Events, dated December 2005, indicates there is a statistically significant seasonal-regional variation in recorded LOOP events from 1997 to 2004. The data shows a comparatively higher probability of a LOOP occurring in the summer months in the NPCC region, the NERC reliability council applicable to Pilgrim. This correlates with recent NRC publications, e.g. NUREG/CR-6890 Reevaluation of Station Blackout Risk at Nuclear Power Plants: Analysis of Loss of Off-site Power Events (1986 – 2004), and Information Notice 2006-06 Loss of Off-site Power and Station Blackout Are More Probable During Summer Period. TR 1011759 Table 4-6 indicates seasonal weighted values of grid-centered events for the NPCC region, in which Pilgrim is located, are 0.75 (Spring), 4.0 (Summer), highly unlikely (Fall), and 1.25 (Winter).

GL 2006-02	Response for Pilgrim Station
5.(d) Are known time-related variations in the probability of a LOOP at your plant site considered in the grid-risk-sensitive maintenance evaluation? If not, what is your basis for not considering them?	Response: No. There are no time-related variations in LOOP probability used at Pilgrim. For 10 CFR 50.65(a)(4) workweek evaluations for activities which either may impact availability of the 345kV lines or mitigating systems, Pilgrim uses a single yearly-averaged initiating event frequency for the loss of off-site power. Pilgrim performs maintenance throughout the year on LOOP-sensitive components (such as EDGs, HPCI, etc.) with procedural consideration of "high risk" periods (severe weather, grid disturbances, transmission system maintenance, etc.) as described in the answer to question 5(a). Based on this, the averaged initiating event frequency is judged to be adequate and there is no need to adjust the initiating event frequency for LOOP for any particular time period.
5.(e) Do you have contacts with the TSO to determine current and anticipated grid conditions as part of the grid reliability evaluation performed before conducting grid-risk-sensitive maintenance activities?	Response: Yes. Communications with the TSO are routinely held and factored in the planning of risk-sensitive equipment maintenance work as discussed in the response to question 5(a).
5.(f) Describe any formal agreement or protocol that you have with your TSO to assure that you are promptly alerted to a worsening grid condition that may emerge during a maintenance activity.	Response: As discussed in the response to question 1(b), ISO-NE has operating procedures which requires the TSO to notify Pilgrim if grid conditions are under stress.
5.(g) Do you contact your TSO periodically for the duration of the grid-risk-sensitive maintenance activities?	Response: Yes. Pilgrim contacts the TSO periodically for the duration of grid-risk-sensitive maintenance activities.

GL 2006-02	Response for Pilgrim Station
5.(h) If you have a formal agreement or protocol with your TSO, describe how NPP operators and maintenance personnel are trained and tested on this formal agreement or protocol.	Response: Pilgrim Work Control personnel are trained to collect grid-related information through the plant operators, who are trained and communicate with the TSO.
5.(i) If your grid reliability evaluation, performed as part of the maintenance risk assessment required by 10 CFR 50.65(a)(4), does not consider or rely on some arrangement for communication with the TSO, explain why you believe you comply with 10 CFR 50.65(a)(4).	Response: Not Applicable.
5.(j) If risk is not assessed (when warranted) based on continuing communication with the TSO throughout the duration of grid-risk-sensitive maintenance activities, explain why you believe you have effectively implemented the relevant provisions of the endorsed industry guidance associated with the maintenance rule.	Response: Not Applicable.

GL 2006-02	Response for Pilgrim Station
5.(k) With respect to questions 5(i) and 5(j), you may, as an alternative, describe what actions you intend to take to ensure that the increase in risk that may result from proposed grid-risk-sensitive activities is assessed before and during grid-risk-sensitive maintenance activities, respectively.	Response: Not Applicable.

GL 2006-02	Response for Pilgrim Station
6. Use of risk assessment results, including the results of grid reliability evaluations, in managing maintenance risk, as required by 10 CFR 50.65(a)(4).	
6.(a) Does the TSO coordinate transmission system maintenance activities that can have an impact on the NPP operation with the NPP operator?	Response: Yes. The TSO coordinates the 345kV transmission system maintenance activities with Pilgrim in accordance with an ISO-NE procedure. For the 23kV distribution line, communications are held with the owner/operator of the 23kV distribution system to identify potential activities.
6.(b) Do you coordinate NPP maintenance activities that can have an impact on the transmission system with the TSO?	Response: Yes. Pilgrim coordinates Pilgrim maintenance activities which could impart the 345kV transmission system with the TSO in accordance with ISO-NE procedures. For the 23kV distribution line, communications are held with the owner/operator of the 23kV distribution system to coordinate items as needed.

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6.(c) Do you consider and implement, if warranted, the rescheduling of grid-risk-sensitive maintenance activities (activities that could (i) increase the likelihood of a plant trip, (ii) increase LOOP probability, or (iii) reduce LOOP or SBO coping capability) under existing, imminent, or worsening degraded grid reliability conditions?	Response: Yes. Pilgrim plans and schedules grid-risk-sensitive maintenance activities taking into consideration grid conditions. Emerging activities are also considered in the on-going maintenance work control process taking into account the grid reliability and voltage conditions.
6.(d) If there is an overriding need to perform grid-risk-sensitive maintenance activities under existing or imminent conditions of degraded grid reliability, or continue grid-risk-sensitive maintenance when grid conditions worsen, do you implement appropriate risk management actions? If so, describe the actions that you would take. (These actions could include alternate equipment protection and compensatory measures to limit or minimize risk.)	Response: Yes. Same as the response to question 6(c) above. Pilgrim procedures are in effect to identify alternate equipment for protection and compensatory measures while performing grid-risk-sensitive maintenance activities, as discussed in response to question 5(a) above.

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6.(e) Describe the actions associated with questions 6(a) through 6(d) above that would be taken, state whether each action is governed by documented procedures and identify the procedures, and explain why these actions are effective and will be consistently accomplished.	Response: As discussed in the response to question 5(a), Pilgrim follows the "Risk Assessment Process" procedure to manage the work control process. The process takes into account the grid conditions and qualitative and/or quantitative risk assessment to comply with the 10 CFR 50.65(a)(4) requirements. Pilgrim plans and schedules grid-risk-sensitive maintenance activities taking into consideration grid conditions. Emerging activities are also considered in the on-going maintenance work control process taking into account the grid reliability and voltage conditions.
6.(f) Describe how NPP operators and maintenance personnel are trained and tested to assure they can accomplish the actions described in your answers to question 6(e).	Response: Pilgrim Senior Reactor Operators and work scheduling personnel are trained on the Pilgrim "Risk Assessment Process" procedure as part of their ongoing position qualification training program.
6.(g) If there is no effective coordination between the NPP operator and the TSO regarding transmission system maintenance or NPP maintenance activities, please explain why you believe you comply with the provisions of 10 CFR 50.65(a)(4).	Response: Not Applicable.

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6.(h) If you do not consider and effectively implement appropriate risk management actions during the conditions described above, explain why you believe you effectively addressed the relevant provisions of the associated NRC-endorsed industry guidance.	Response: Not Applicable.
6.(i) You may, as an alternative to questions 6(g) and 6(h) describe what actions you intend to take to ensure that the increase in risk that may result from grid-risk-sensitive maintenance activities is managed in accordance with 10 CFR 50.65(a)(4).	Response: Not Applicable.

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Off-site power restoration procedures in accordance with 10 CFR 50.63 as developed in Section 2 of RG 1.155 Pursuant to 10 CFR 50.63, the NRC requires that each NPP licensed to operate be able to withstand an SBO for a specified duration and recover from the SBO. NRC RG 1.155 gives licensees guidance on developing their approaches for complying with 10 CFR 50.63.	
7. Procedures for identifying local power sources[1] that could be made available to resupply your plant following a LOOP event. Note: Section 2, "Off-site Power," of RG 1.155 (ADAMS Accession No. ML003740034) states: Procedures should include the actions necessary to restore off-site power and use nearby power sources when off-site power is unavailable. As a minimum, the following potential causes for loss of off-site power should be considered: - Grid under-voltage and collapse - Weather-induced power loss - Preferred power distribution system faults that could result in the loss of normal power to essential switchgear buses	
7.(a) Briefly describe any agreement made with the TSO to identify local power sources that could be made available to re-supply power to your plant following a LOOP event.	Response: The TSO has a detailed system blackout recovery procedure, which describes the process by which the New England electric system would be re-established if power was lost to a part of the entire ISO-NE region. Included in this procedure is acknowledgement of the importance of re-establishing power to the NPPs as a priority action.
7.(b) Are your NPP operators trained and tested on identifying and using local power sources to resupply your plant following a LOOP event? If so, describe how.	Response: Not Applicable. This is a TSO action not the action of the Pilgrim operators.

[1] This includes items such as nearby or onsite gas turbine generators, portable generators, hydro generators, and black-start fossil power plants.

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7.(c) if you have not established an agreement with your plant's TSO to identify local power sources that could be made available to resupply power to your plant following a LOOP event, explain why you believe you comply with the provisions of 10 CFR 50.63, or describe what actions you intend to take to establish compliance.	Response: Not Applicable.

GL 2006-02	Response for Pilgrim Station
Losses of off-site power caused by grid failures at a frequency of equal to or greater than once in 20 site-years in accordance with Table 4 of Regulatory Guide 1.155 for complying with 10 CFR 50.63 Pursuant to 10 CFR 50.63, the NRC requires that each NPP licensed to operate be able to withstand an SBO for a specified duration and recover from the SBO. NRC RG 1.155 gives licensees guidance on developing their approaches for complying with 10 CFR 50.63.	
8. Maintaining SBO coping capabilities in accordance with 10 CFR 50.63.	
8.(a) Has your NPP experienced a total LOOP caused by grid failure since the plant's coping duration was initially determined under 10 CFR 50.63?	Response: Yes.
8.(b) If so, have you reevaluated the NPP using the guidance in Table 4 of RG 1.155 to determine if your NPP should be assigned to the P3 off-site power design characteristic group?	Response: No. Pursuant to 10 CFR 50.63 (Station Blackout Rule), Pilgrim installed a station blackout diesel generator (SBODG) to provide power to either one of the two emergency 4.16 kV buses within 10 minutes of declaring an SBO event.
8.(c) If so, what were the results of this reevaluation, and did the initially determined coping duration for the NPP need to be adjusted?	Response: Not Applicable.

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8.(d) If your NPP has experienced a total LOOP caused by grid failure since the plant's coping duration was initially determined under 10 CFR 50.63 and has not been reevaluated using the guidance in Table 4 of RG 1.155, explain why you believe you comply with the provisions of 10 CFR 50.63 as stated above, or describe what actions you intend to take to ensure that the NPP maintains its SBO coping capabilities in accordance with 10 CFR 50.63.	Response: Pursuant to 10 CFR 50.63 (Station Blackout Rule), Pilgrim installed a station blackout diesel generator to provide power to either one of the two emergency 4.16 kV buses within 10 minutes of declaring an SBO event.

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Actions to ensure compliance	
9. If you determine that any action is warranted to bring your NPP into compliance with NRC regulatory requirements, including TSs, GDC 17, 10 CFR 50.65(a)(4), 10 CFR 50.63, 10 CFR 55.59 or 10 CFR 50.120, describe the schedule for implementing it.	Response: No actions are identified.