L-HU-06-030
July 21, 2006 10 CFR 50.54(f)

U. S. Nuclear Regulatory Commission
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Point Beach Nuclear Plant Units 1 and 2
Dockets 50-266 and 50-301
Renewed License Nos. DPR-24 and DPR-27

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Prairie Island Nuclear Generating Plant
Units 1 and 2
Dockets 50-282 and 50-306
License Nos. DPR-42 and DPR-60

Monticello Nuclear Generating Plant
Docket 50-263
License No. DPR-22

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

By letter dated February 1, 2006, the Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power." The NRC requested that specific information be provided within 60 days of the date of this GL. The Nuclear Management Company, LLC (NMC) submitted the requested information by letter L-HU-06-010 dated April 3, 2006.

In response to an NRC request, NMC submits this letter and enclosures which replace NMC letter L-HU-06-010 dated April 3, 2006 and its enclosures in their entirety.

Enclosures 1 through 4 provide the requested information for the Point Beach Nuclear Plant, Palisades Nuclear Plant, Prairie Island Nuclear Plant and Monticello Nuclear Plant, respectively.

Some of the questions in GL 2006-02 seek information about analyses, procedures, and activities concerning grid operation of which the Nuclear Management Company, LLC (NMC) does not have first-hand knowledge and of which are beyond the control of NMC. In providing information responsive to such questions, NMC makes no representation as to their accuracy or completeness.

Some GL 2006-02 questions are directed toward compliance with 10CFR Part 50, Appendix A, "General Design Criteria", (GDC) Criterion 17. The NMC-operated plants were licensed prior to the formal publication of the GDC. As noted in SECY-92-223, all plants with Construction Permits issued prior to May 21, 1971 are not subject to these provisions and each licensee has its own licensing basis. As a Systematic Evaluation

Program (SEP) plant, the Palisades Nuclear Plant complies with GDC 17 to the extent described in the Technical Specification Bases and the Final Safety Analysis Report.

Generally, the NMC-operated plants were licensed to comply with the Atomic Energy Commission General Design Criteria as proposed on July 10, 1967 (AEC GDC) as described in the plant Final (Updated) Safety Analysis Report. AEC GDC proposed Criterion 39, which provides guidance applicable to the design of the AC electrical power system supplies to the engineered safety features, states:

> Alternate power systems shall be provided and designed with adequate independency, redundancy, capacity, and testability to permit the functioning required of the engineered safety features. As a minimum, the onsite power system and the offsite power system shall each, independently, provide this capacity assuming a failure of a single active component in each power system.

Thus, many of the provisions of GDC Criterion 17 are not applicable to the NMC-operated plants, the responses to the questions reflect that the plants are not committed to GDC Criterion 17, and the responses do not in any manner commit to or imply compliance with GDC Criterion 17 for the NMC-operated plants.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on **21 July 2006**.

Edward J. Weinkam
Director, Nuclear Licensing and Regulatory Services
Nuclear Management Company, LLC

Enclosures (4)

cc: Administrator, Region III, USNRC
Project Manager, Point Beach Nuclear Plant, Palisades Nuclear Plant, Prairie Island Nuclear Generating Plant, and Monticello Nuclear Generating Plant, USNRC
Senior Resident Inspector, Point Beach Nuclear Plant, Palisades Nuclear Plant, Prairie Island Nuclear Generating Plant, and Monticello Nuclear Generating Plant, USNRC

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 offsite power systems under plant Technical Specifications. GDC 17, 10 CFR Part 50, Appendix A, 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).

Question 1	
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 offsite power systems under plant Technical Specifications.	
(a) Do you have a formal agreement or protocol with your TSO?	Yes. The Transmission System Operator (TSO) to which the Point Beach Nuclear Plant (PBNP) supplies power is the American Transmission Company (ATC, referred to as the TSO in this response). The PBNP is owned by We Energies and operated by Nuclear Management Company, LLC (NMC). Although NMC is the plant operating entity, references to management actions on behalf of PBNP in the remainder of this document are referred to as PBNP. PBNP does have a formal agreement with We Energies and ATC. In addition, PBNP and the TSO follow the approved Midwest Independent System Operator (MISO) communication and mitigation protocols for nuclear plant/electric system interfaces that describe the notification requirements.
(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 TSO is required to notify PBNP immediately whenever the real time voltage on the PBNP 345 kV bus goes outside of specified voltage limits (high or low). These limits are intended to ensure that adequate voltage is present to supply safety related equipment and prevent actuation of the degraded grid voltage relays. Specific examples of known potentially degrading conditions identified in the agreement include:

Question 1	
the notification	1. The TSO will notify PBNP within 15 minutes after verification, if it is determined that the loss of any single transmission element or generator connected to the TSO transmission system would cause the PBNP 345 kV bus voltage to go outside of the specified limits. If the condition triggering the notification is resolved within the notification time requirement, then notification is not required. 2. The TSO will notify PBNP of forced outages on either end of any 345 kV transmission line connected to the PBNP switchyard as well as other critical transmission lines. 3. Notifications for VAR adjustments are routinely made by the TSO through We Energies Power System Supervisors (WEPSS) to PBNP. In an emergency the TSO may communicate directly to PBNP.
(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.	Grid conditions and status are the primary responsibility of the TSO and Reliability Coordinator (MISO). PBNP does not typically initiate communication with the TSO based upon grid conditions. PBNP relies upon the agreements and protocols to be notified of grid conditions as described in the response to question 1(b) above. PBNP procedures address conditions that could affect the grid and that require communication with the TSO. These communications are normally through WEPSS. Reasons for notifications include: removal from service or testing of emergency diesel generators or the gas turbine generator, either unit voltage regulator placed in manual, or power system stabilizer out of service on either unit.
(d) Describe how NPP operators are trained and tested on the use of the	Review of the procedure for electrical communications, switchyard access and work planning is typically performed in initial license operator training as a result of an association to the task that is being trained. Senior Reactor Operators (SROs) are trained and evaluated via the On-

Question 1	
procedures or assessing grid conditions in question 1(c).	the-Job Training (OJT) and Task Performance Evaluation (TPE) process on coordinating with TSO/WEPSS for load changes. Control Operators (and instant SROs) are trained and evaluated via the OJT and TPE process on performing a Technical Specification (TS) Test of the Emergency Diesel Generators (EDG). Contained within the TS procedures are Initial Conditions and a procedural step requiring notifications to TSO and WEPSS of testing EDGs. Control Operators (and instant SROs) are trained and evaluated via the OJT and TPE process on performing a start of the gas turbine. Contained within the Operating Instructions are Precautions and Limitations and a procedural step directing notification to WEPSS of operating the gas turbine generator. During classroom training on the 345 kV sstem, operators are presented an overview of the procedure for electrical communications, switchyard access and work planning. During classroom training on normal power operations, operators discuss the responsibilities of the WEPSS regarding 345 kV voltage control as listed in plant procedures. Selected procedural topics may also be reviewed as part of task-based training in the classroom or simulator. Recent examples of training as part of a task review are: ▪ During licensed operator continuing training on Loss of Offsite Power and Significant Operating Event Report (SOER) 99-01, Loss of Grid, in 2006: a review of the procedural communication responsibilities for the TSO, PBNP Production Planning Group, and PBNP Shift Supervision was conducted as part of a discussion on the lessons learned from the August 2003 Loss of Grid event outlined in SOER 99-01 addendum. ▪ During licensed operator continuing training on Post Trip Stabilization in 2004: operators implemented the procedural steps requiring them to notify the TSO when the main generator disconnects are opened.
(e) If you do not have a formal agreement or protocol	PBNP does have a formal agreement with the TSO; thus, this question is not applicable.

Question 1	
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.	
(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).	As previously stated in response to question 1(a), PBNP does have a formal TSO agreement. Grid conditions in which the TSO will notify PBNP are described in the response to question 1(b) above. This includes conditions in which real-time voltage or the contingent loss of any single transmission element or generator connected to the TSO transmission system would result in PBNP 345 kV bus voltage above or below the specified limits.
(g) Describe the low	At PBNP, degraded voltage is not sensed in the switchyard. The degraded voltage protection

Question 1	
switchyard voltage conditions that would initiate operation of plant degraded voltage protection.	scheme senses voltage at the 4.16 kV safety related buses. Initiation of the degraded voltage protection would occur if the 345 kV system (switchyard) voltage would drop to a point where safety related 4.16 kV bus voltage would reach the degraded voltage relay dropout setpoint. Current PBNP Technical Specification degraded voltage allowable values are: Greater than or equal to 3937 Volts; time delay of less than 6.47 seconds with a Safety Injection (SI) signal present; time delay of less than 54 seconds without an SI signal present. Therefore, if switchyard voltage was at or below minimum per operating procedures, the degraded voltage protection scheme may initiate depending upon plant operating conditions (normal operation, loss of coolant accident (LOCA), unit trip, etc.). The degraded voltage protection scheme ensures that the safety related equipment will have sufficient voltage to perform their designated safety functions while supplied from offsite power, or the equipment will be separated from offsite power and supplied from the onsite emergency power system.

Question 2	
2. Use of criteria and methodologies to assess whether the offsite power system will become inoperable as a result of a trip of your NPP.	
(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 offsite power system inoperable during	Yes. The TSO makes use of analysis tools to predict grid conditions that would make the PBNP offsite power system non-functional. These tools are not available to the PBNP. The TSO currently uses both offline (PSSE, Areva, POM/OPM, VSAT, etc.) and online (Areva energy management system) analytical tools to determine grid conditions under a variety of situations. The online analysis is performed approximately once every 5 minutes while the offline analysis is performed on an as needed basis. Note that the TSO can change the selection and use of the analytical tools, provided they perform the functions required to support the agreements and protocols.

Question 2	
various contingencies? If available to you, please provide a brief description of the analysis tool that is used by the TSO.	
(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?	Yes. The TSO uses the above analysis tools, in conjunction with procedures, as the basis for determining when conditions warrant PBNP notification. Notifications are made based on grid configurations being outside of predefined procedure requirements or based on unsatisfactory monitoring and predictive analysis computer program tool results. Refer to the response to question 1(b) above.
(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	The analysis tools identify when a trip of either PBNP unit would result in switchyard voltages falling below the specified limit. The analysis tools determine grid voltages that would occur immediately as the result of the unit trip, based upon the current grid configuration. Following a unit trip, the analysis tools would continue to monitor grid configuration and would identify N-1 contingencies that would result in switchyard voltages falling below the specified limit.

Question 2	
actuation of plant degraded voltage protection? If not, discuss how such a condition would be identified on the grid.	
(d) If your TSO uses an analysis tool, how frequently does the analysis tool program update?	The TSO's current online analysis tool updates approximately every 5 minutes. It will immediately update following the operation of any breaker 100 kV or greater, or as initiated by the system operator. The TSO completes off-line studies on an as needed basis. Note that the TSO can change the selection and use of the analytical tools, provided they perform the functions required to support the agreements and protocols.
(e) Provide details of analysis tool-identified contingency conditions that would trigger an NPP licensee notification from the TSO.	The contingencies that are modeled and studied include the loss of any single TSO transmission line or transformer as well as any generator connected to the TSO's system. The contingency definition for the loss of either PBNP unit includes the transfer of its auxiliary load from the main auxiliary transformer to the associated reserve auxiliary transformer. PBNP is notified whenever any N-1 contingency results in voltages outside of predefined limits.
(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 offsite power	Yes. If the TSO loses the ability to monitor and predict the operation of the transmission system, they would validate that MISO maintained this ability and would also notify PBNP. If MISO also lost this ability, the TSO would continue to monitor the grid and would perform offline studies or would confirm that the real-time conditions were within the existing study assumptions. Therefore, if the on-line analysis tools were out-of-service, operability would continue to be evaluated.

Question 2	
voltage and capacity could be inadequate? If so, how does the NPP licensee determine that the offsite power would remain operable when such a notification is received?	
(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?	No. For post event analysis, the TSO does not verify by procedure the switchyard voltages are bounded by the analysis tools. Following an inadvertent trip of one or both PBNP units, any unexpected actuations or equipment operation associated with supply voltage would be documented and evaluated in accordance with the corrective action process.
(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?	Not applicable to PBNP since the TSO analysis tools are presently in use.
(i) If an analysis tool is not available, does your TSO perform periodic studies to verify that adequate offsite	Not applicable to PBNP since the TSO analysis tools are presently in use.

Question 2	
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? (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? (b) If the bounds of the analyses are exceeded, does this condition trigger the notification provisions discussed in question 1 above?	
(j) If your TSO does <u>not</u> 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 offsite power capability,	Not applicable to PBNP since the TSO utilizes analysis tools and communicates the applicable results to PBNP.

Question 2	
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 offsite power system will be sufficiently reliable and remain operable with high probability following a trip of your NPP.	

Question 3	
3. Use of criteria and methodologies to assess whether the NPP's offsite power system and safety-related components will remain operable when switchyard voltages are inadequate.	
(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	By procedure, PBNP will declare the associated offsite power circuits inoperable and enter the associated Technical Specification Action Condition (TSAC) when the TSO notifies PBNP that a single element (most limiting) failure can cause the 345 kV system to drop below the specified minimum voltage. This procedural control, which enters the TSAC based on a postulated single element failure, is more restrictive than the plant licensing basis which states that the sudden loss of any single generating unit will not affect the ability of the transmission system to supply power to the PBNP auxiliary systems.

Question 3	
(including NPP licensees using allowable value in its TSs) and would actuate plant degraded voltage protection, is the NPP offsite power system declared inoperable under the plant TSs? If not, why not?	
(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?	The plant accident analyses evaluate a loss of offsite power (LOOP) occurring coincident with various accidents. A postulated double sequencing event is outside the plant's licensing basis and has not been evaluated. Equipment operability is based on performance of safety functions and safety support functions required within the plant licensing basis.
(c) Describe your evaluation of onsite safety-related equipment to determine	Double sequencing is not in the PBNP licensing basis and PBNP is not designed or analyzed for double sequencing scenarios.

Question 3	
whether it will operate as designed during the condition described in question 3(b).	
(d) If the NPP licensee is notified by the TSO of other grid conditions that may impair the capability or availability of offsite power, are any plant TS action statements entered? If so, please identify them.	No. Technical Specification Conditions are not entered for grid conditions other than those mentioned above.
(e) If you believe your plant TSs do not require you to declare your offsite 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 offsite power system and safety-related components will remain operable when switchyard voltages are	Not applicable to PBNP since offsite power sources will be declared inoperable as described in the response to question 3(a) above in accordance with the plant licensing basis and Technical Specifications.

Question 3	
inadequate.	
(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).	The compensatory actions discussed in response to questions 3(a) through 3(e) involve entering Technical Specification Conditions. PBNP operators are trained in the interpretation and use of plant Technical Specifications and associated compensatory measures.

Question 4	
4. Use of criteria and methodologies to assess whether the offsite power system will remain operable following a trip of your NPP.	
(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	Yes. Procedural guidance is provided to the PBNP operators. Guidance is provided in the PBNP normal power operation procedure for controlling the generator voltage regulators and the power system stabilizers and notifying the TSO through WEPSS when the voltage regulators are placed in manual or the power system stabilizers are disabled. PBNP does not have tap changing transformers, capacitor banks or VAR compensators. Operator training on electrical communications, switchyard access and work planning occurs as indicated in the response to question 1(d). The power system stabilizers are relatively new pieces of equipment at PBNP. Operators were trained on the power system stabilizers after their installation.

Question 4	
compensators, main generator voltage regulators) can adversely affect the operability of the NPP offsite power system? If so, describe how the operators are trained and tested on the guidance and procedures.	
(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 offsite 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.	Not applicable. PBNP does have procedural guidance that provides the operator with written direction for responding to equipment malfunctions and manipulation of controls that can adversely affect the operability of the PBNP offsite power system.

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.

Question 5	
5. Performance of grid reliability evaluations as part of the maintenance risk assessments required by 10 CFR 50.65(a)(4).	
(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-	Yes. The effect on the maintenance risk assessment of plant activities, environmental conditions, or grid conditions that affect offsite power reliability at PBNP is included quantitatively, but this is done by using a qualitatively-derived multiplier for the LOOP frequency in the calculation. PBNP utilizes a software tool to perform on-line risk management. The safety monitor tool calculates the risk of a particular plant configuration using the probabilistic risk assessment (PRA) model for the appropriate unit. The complete plant configuration includes which equipment is unavailable, the alignment of running and standby plant equipment, and any environmental/test factors in effect. Four of the environmental/test factors in Safety Monitor increase the LOOP frequency in the PRA calculation above the base value by using either one of two multipliers. The intent of these multipliers is to move the LOOP frequency to the upper end of the statistical distribution while the associated testing, grid condition or environmental condition is in effect. By including the impact this way, the PRA results are made more sensitive to those other activities that affect the ability of PBNP to mitigate the impact of a loss of offsite power, such as maintenance on an emergency diesel generator or on a turbine driven auxiliary feedwater pump.

Question 5	
driven pump, an alternate AC power source) out-of-service?	
(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?	Notifications of operating criteria violations are made as described above in the response to question 1(b) above. Risk would be reassessed upon this notification. In addition the online risk management tool contains factors that can be applied for onsite switchyard work, some types of grid work, peak demand, severe weather, and severe cold. Online risk is monitored on a real time basis by the shift technical advisors to validate the planned risk assessment.
(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? 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	Typically the grid carries more power during summer months due to heavier loading. However the stress on the grid is a function of what equipment is in service and the ability of the grid to handle the increased loading. Grid stress varies and can be affected by weather-related or other equipment failures, planned outages, or periods of high demand. Planned outages and maintenance consider grid conditions and seasonal demand to manage overall grid stress. Existing procedures and protocols used by the TSO provide guidance on the grid operations to maintain grid reliability and stability. Current industry data is inconclusive relative to the degree of seasonal variation in LOOP frequency. Because LOOP frequency for PBNP is very low and because outages and maintenance are effectively managed, there is no identified seasonal variation in LOOP frequency.

Question 5	
question is yes, discuss the time of year when the variations occur and their magnitude.	
(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?	Seasonal variations in the LOOP probability are not significant at PBNP and therefore do not provide a usable basis for an adjustment in the safety monitor LOOP frequency determined solely from those variations. The safety monitor tool has environmental/test factors for grid work, switchyard work, peak demand, and severe weather to account for other variations in LOOP probability. Criteria for when to include these factors are contained in the on-line safety assessment procedure.
(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?	Yes. PBNP coordinates with the TSO to schedule and implement major work in the PBNP switchyard. PBNP will contact the TSO when scheduling work activities that remove the G-05 gas turbine or an EDG from service to verify that line outages and other work which may reduce reliability of the offsite power supplies is not scheduled concurrently.
(f) Describe any formal agreement or protocol that you have with your TSO to assure that you are promptly alerted to a worsening grid	The TSO will notify PBNP in accordance with the agreement discussed in response to question 1(a) based upon grid conditions described in the response to question 1(b) above. These notifications would be provided to PBNP whether or not maintenance is on-going.

Question 5	
condition that may emerge during a maintenance activity.	
(g) Do you contact your TSO periodically for the duration of the grid-risk-sensitive maintenance activities?	PBNP does not routinely contact the TSO during grid-risk-sensitive maintenance activities. PBNP would be notified of grid conditions described in the response to question 1(b) above and would follow procedures to reassess risk or take required actions.
(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.	There is no formal training provided to the plant operators and maintenance personnel on the details of the formal agreement between PBNP and the TSO and/or MISO. Portions of the formal agreement which impact operations and/or maintenance have, however, been extracted from the agreement and incorporated into plant procedures. Training on this procedural material is provided as discussed below. Operations personnel receive training on the communication requirements outlined in the PBNP procedures for electrical communications, switchyard access, work planning and normal power operations. These procedures include the requirements for PBNP to communicate with the TSO and WEPSS for notifications from the TSO concerning operability of offsite power. Refer to the responses to questions 1(d) and 3(f) for descriptions of the training provided. No training is provided to maintenance personnel.
(i) If your grid reliability evaluation, performed as part of the maintenance risk assessment required by 10 CFR 50.65(a)(4), does not	A formal agreement for communication exists which would result in notification of grid conditions that would be considered as part of maintenance risk assessment. Therefore, this question is not applicable.

Question 5	
consider or rely on some arrangement for communication with the TSO, explain why you believe you comply with 10 CFR 50.65(a)(4).	
(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.	Not applicable to PBNP. The TSO communicates grid conditions to the plant shift supervision and that information is incorporated into online risk assessments as described above (see answer to question 5(d)).
(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	No alternative actions to be taken.

Question 5	
maintenance activities, respectively.	

Question 6	
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).	
(a) Does the TSO coordinate transmission system maintenance activities that can have an impact on the NPP operation with the NPP operator?	Yes. The TSO communicates with PBNP to schedule online work; including switching and grounding activities that may affect the diversity of the power feed to PBNP, and work on the transmission elements that affect PBNP.
(b) Do you coordinate NPP maintenance activities that can have an impact on the transmission system with the TSO?	Work at PBNP is coordinated through WEPSS for activities involving the 345 kV switchyard, Unit load changes, operation or removal from service of the gas turbine, or loading an EDG. WEPSS coordinates with the TSO. The PBNP production planning group also communicates with the TSO to schedule online work involving switchyard equipment owned by the TSO.
(c) Do you consider and implement, if warranted, the rescheduling of grid-risk-sensitive maintenance	Yes. The online safety assessment process would reevaluate in-progress and scheduled grid-risk-sensitive maintenance activities following notification of grid conditions as described in the response to question 1(b) above. Risk management actions are taken such as limiting voluntary TSAC entries, trip transient evolutions, or work on or near components that could

Question 6	
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?	affect generation or offsite power.
(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.)	The PBNP online safety assessment procedure contains guidance for risk assessment, contingency actions and compensatory measures to take if the plant is in an elevated risk condition. Alternate power sources such as the EDG and gas turbine generator would be verified to be available. Critical equipment would be posted as protected. Additional risk mitigation strategies would be used to address human error probability such as pre-job briefs, supervisory oversight, and peer checks.
(e) Describe the actions	PBNP has procedures that address coordination of maintenance activities with the TSO, risk

Question 6	
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.	assessment and associated risk mitigation strategies for both online and shutdown unit work, protecting critical equipment, and managing human performance risk. Communication occurs between PBNP and the TSO when PBNP or the TSO schedules maintenance activities affecting the transmission system, as required in the procedures. Risk assessment is performed for scheduled and emergent work, which includes assessment of grid conditions. Actions would be taken to assess and mitigate risk for changes in grid conditions included in the communication protocols. These actions would be effective and consistently accomplished because they are part of the existing work management process and are implemented effectively for online and outage work.
(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).	Reference the answer to question 1(d) for operations training on the procedure for electrical communications, switchyard access and work planning. The ILT course on Transient Accident Analysis and Mitigating Core Damage contains a classroom lesson plan on Shutdown Safety Assessment, which includes a review of the procedure for protected critical equipment. The course also includes a classroom lesson on probabilistic safety assessment and on-line safety monitoring per associated procedures. In ILT, shutdown safety assessment and on-line safety assessment are trained and evaluated by trainee completion of the OJT/TPE qualification card for SROs, Licensed Shift Technical Advisors (STAs), and Non-Licensed STAs. ▪ SRO, Authorize performance of maintenance ▪ STA, Perform On-Line Safety Monitoring ▪ STA, Perform Shutdown Safety Assessments Licensed Operator Continuing Training: The procedure for managing work activity risk is among the administrative topics listed in the Licensed Operator Continuing program that are selected for training by the Operations Manager. A training review of the procedure for managing work activity risk occurred most

Question 6	
	recently in Administrative Procedure Review for SROs in 2005. The shutdown safety assessment procedure was last reviewed by Licensed Operator Continuing training in SRO/STA Task Review during 2005. The requirements of the procedure for protected critical equipment are customarily reinforced during cycle training and evaluations by identifying protected critical equipment with placards per the plant procedure when equipment is removed from service for training or evaluation scenarios in the simulator. The procedure for on-line safety monitoring was last reviewed with licensed operators during 2001. No training is provided to maintenance personnel related to this question.
(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).	Not applicable. There is effective coordination between PBNP and the TSO regarding transmission system maintenance or PBNP maintenance activities. Such coordination is in accordance with procedures and communication protocols.
(h) If you do not consider and effectively implement appropriate risk management actions during the conditions described above, explain why	As discussed in response to questions 6(a) through 6(d), PBNP effectively implements appropriate risk management actions.

Question 6	
you believe you effectively addressed the relevant provisions of the associated NRC-endorsed industry guidance.	
(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).	No alternative actions to be taken.

Offsite 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.

Question 7
7. Procedures for identifying local power sources that could be made available to resupply your plant following a LOOP

Question 7	
event. Note: Section 2, "Offsite Power," of RG 1.155 (ADAMS Accession No. ML003740034) states: Procedures should include the actions necessary to restore offsite power and use nearby power sources when offsite power is unavailable. As a minimum, the following potential causes for loss of offsite 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	
(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.	We Energies has an agreement with PBNP to ensure that PBNP is provided with an assured source of off-site power, sufficient to meet the requirements of the Operating License and NRC regulations. The TSO participates in the development and implementation of the black start and system restoration plan established for the loss of all or part of the transmission system with the MISO Power System Restoration Working Group (PSRWG) to re-supply PBNP Switchyard following a LOOP event. The MISO PSRWG includes the TSO and We Energies (owner of PBNP) as well as MISO and other utilities in the TSO footprint.
(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.	The TSO is responsible for restoration of power to the Point Beach Switchyard in the event of a LOOP. PBNP operators are not trained on the specifics of restoring power to the switchyard. PBNP procedures identify available power sources and provide guidance for re-supplying needed on-site buses from the available power sources. Among the sources are EDGs, unit cross-tie lines, and the G-05 Gas Turbine Generator. Operators are trained and tested on the use and alignments of these power sources for restoration following a LOOP or Station Blackout. Specific procedures include:

Question 7	
	In initial licensed operator training: ▪ In the Integrated Operations training course associated with applying the procedure for declining grid frequency, trainees respond in a training scenario to a declining grid frequency. Their response is limited to pre-trip actions since the trainees have not yet been introduced to emergency operating procedures. ▪ During the Emergency Operating Procedures course, trainees respond to a unit blackout and restore safeguards power from the G-05 Gas Turbine Generator per the procedure for Loss of All AC Power. In licensed operator continuing training: ▪ In 2006, a dual unit training scenario on a complete loss of the offsite power grid required operators to manually restore both trains of safeguards power to Unit 2 from the emergency diesel generators. In addition, due to an extended loss of offsite power, operators had to start the G-05 Gas Turbine Generator, restore important non-safeguards buses for both units per the abnormal operating procedure, and then parallel with offsite power after it was restored. ▪ In 2005 operating crews were tested on their ability to respond to a complete loss of the offsite power grid and dual unit station blackout. Crews were timed on their ability to meet the site's one hour coping strategy by implementing the procedures to restore safeguards buses to both units and safety-related DC battery chargers from the G-05 Gas Turbine Generator.
(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	PBNP has established agreements as described in the response to question 7(a) above. Therefore this question is not applicable to PBNP.

Question 7	
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.	

Losses of offsite 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.

Question 8	
8. Maintaining SBO coping capabilities in accordance with 10 CFR 50.63.	
(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?	No. No total Loss of Offsite Power events caused by grid failure have occurred since the plant's coping duration was initially determined in an April 17, 1989 letter and subsequently revised in later correspondence.

Question 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 offsite power design characteristic group?	Not applicable.
(c) If so, what were the results of this reevaluation, and did the initially determined coping duration for the NPP need to be adjusted?	Not applicable.
(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	Not applicable.

Question 8	
take to ensure that the NPP maintains its SBO coping capabilities in accordance with 10 CFR 50.63.	

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.	Based on the responses provided above, NMC considers that operation and maintenance of the PBNP is in compliance with the noted regulatory requirements to the extent described in the plant's licensing basis.

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 offsite power systems under plant Technical Specifications. GDC 17, 10 CFR Part 50, Appendix A, 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).

Question 1	
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 offsite power systems under plant Technical Specifications.	
(a) Do you have a formal agreement or protocol with your TSO?	Yes. The Transmission System Operator (TSO) to which the Palisades Nuclear Plant (PNP) supplies power is owned by the Michigan Electric Transmission Company (METC) and operated and maintained by the Consumer Energy Company. The PNP is owned by Consumers Energy Company and operated by Nuclear Management Company, LLC (NMC). Although NMC is the plant operating entity, references to management actions on behalf of PNP in the remainder of this document are referred to as PNP. PNP does have a formal agreement with METC, the owner of the transmission system to which PNP is connected. The agreement is documented in "Amendment and Restatement of the April 1, 2001 Generator Interconnection Agreement," between Michigan Electric Transmission Company and Consumers Energy Company. In addition, Midwest Independent System Operator (MISO) and the MISO interconnected nuclear power plants and their associated Transmission Owners (TOs) have developed a generic communication protocol, "Communication and Mitigation Protocols for Nuclear Plant/Electric System Interfaces," to address roles and responsibilities in grid monitoring and communication The TOs are signatories to the MISO Transmission Owners Agreement. Appendix E Section

Question 1	
	C, states, "For Members and Users who are operators of nuclear generating facilities, the MISO shall enter into written agreements, which define scheduling protocols, limitations, and restrictions necessary to ensure the safety and reliability of such facilities." Efforts to develop these agreements with each nuclear plant are in progress.
(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	The TSO is required by the agreement to immediately notify PNP whenever an impaired or potentially degraded grid condition is recognized by the TSO. Specific examples of known potentially degrading conditions identified in the agreement include: 1. Voltage calculated to be less than a specified value following a trip of the PNP unit; and 2. Deficient operating reserve requiring canceling maintenance activities which could jeopardize generating equipment. In addition, The MISO Communication Protocol states MISO will monitor the appropriate system conditions and notify the nuclear plant's operating personnel via the transmission operator when operating conditions are outside of established limits, as well as, when they are restored to within acceptable criteria.
(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	Grid conditions and status are the primary responsibility of the TSO and Reliability Coordinator (MISO). The observable parameters of the PNP operator include only voltage and frequency, generator reactive output, breaker status, line status, and certain switchyard alarm points. Relative to this question, "grid conditions" is assumed to be changes that impact the TSO's analysis of the grid interface. PNP notifies the TSO for changes in the following plant or grid conditions: • Inability to maintain voltage schedule; • Operation with the controls for the main generator or turbine in manual; • Removal of generator protective relaying from service; and

Question 1	
TSO.	• Voltage approaching the value where trip of the unit could result in low grid voltage. Requirements for these communications are included in PNP procedures associated with "Main Turbine and Generating Systems" and "Station Power."
(d) Describe how NPP operators are trained and tested on the use of the procedures or assessing grid conditions in question 1(c).	As part of their initial training, Licensed Operators are instructed on the requirements associated with grid voltage. Training related to these requirements is provided in association with training on the appropriate procedures which specify the requirements. This training is provided in the following lesson plans: • Station Power; and • Main Generator. Additionally, annual training is provided in "Summer Readiness" training as required by a Nuclear Management Fleet Policy on Seasonal Readiness. This training contains instruction on the following applicable items: • Review of switchyard components and operation; • Review of symptoms of grid disturbance, and the potential affect on generator and generator auxiliaries; and • Review of station procedures for response to grid anomalies.
(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	PNP does have a formal agreement with the TSO; thus, this question is not applicable.

Question 1	
intend to take to assure compliance with GDC 17.	
(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).	As previously stated in response to question 1(a), PNP does have a formal TSO agreement. The agreement requires that the TSO promptly notify PNP when grid conditions are such that a trip of PNP unit would result in an unacceptable voltage in the switchyard. These communication requirements are included in the plant procedure addressing station power. Additionally, The MISO Communication Protocol states, "the MISO or the Transmission Operator will initiate communication with each other to verify study results that indicate a post-contingent violation of operating criteria." Upon verification, the Transmission Operator and the MISO will immediately initiate steps to mitigate the pre and post contingent operating criteria violation.
(g) Describe the low switchyard voltage conditions that would initiate operation of plant degraded voltage protection.	At PNP, degraded voltage is not sensed in the switchyard. The degraded voltage protection scheme senses voltage at the 2400 V safety related buses. The nominal setting for the relays is 93% of rated voltage. When bus voltage decreases below the setpoint, and following a 0.65 second delay, the emergency diesel generators are started and a timer is initiated. If voltage does not recover above the degraded voltage reset value (nominally 93.5%) within 6 seconds,

Question 1	
	load shed is actuated, the emergency diesel generator (EDG) breaker is closed and safety related loads are sequenced onto the safety related buses.

Question 2	
2. Use of criteria and methodologies to assess whether the offsite power system will become inoperable as a result of a trip of your NPP.	
(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 offsite 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.	Yes. The TSO makes use of analysis tools to predict grid conditions that would make a PNP offsite power circuit inoperable. These tools are not available to the PNP. The following description is based on conversations with and a demonstration of the real time system analysis tool. The TSO maintains a computer simulation of the METC transmission system. The computer model evaluates real time system conditions obtained from the Supervisory Control and Data Acquisition (SCADA) system and predicts post contingency voltages and load flows for approximately 650 contingencies. These contingencies include transmission system element failures including a trip of the PNP main generator. The real-time analysis, referred to as the Security Analysis, is run every 15 minutes. For the contingency of the PNP main generator tripping, an alarm is provided to the System Control Operator if the case indicates that the Palisades Switchyard voltage would decrease below a specified value. Additionally, MISO Energy Management System (EMS) includes a State Estimator (SE) that currently runs every 90 seconds and Real-Time Contingency Analysis (RTCA) program that runs every 5 minutes. The Contingency Analysis analyzes over 7000 contingencies based on the transmission owner's criteria. One of the contingencies analyzed by the MISO EMS is the trip of PNP. The analysis provides results with respect to thermal, voltage, and voltage drop

Question 2	
	limit violations.
(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?	Yes. The TSO uses the above analysis tools, in conjunction with procedures, as the basis for determining when conditions warrant PNP notification. The Security Analysis, described in response to question 2(a) above, generates a critical alarm if the PNP trip results in a post contingency voltage less than a specified value. The TSO is required by procedure to notify PNP promptly if this alarm is received, while MISO is required to promptly notify the TSO if their alarm is received.
(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	Yes. Both the TSO and MISO analysis tools, in conjunction with PNP's analysis, identifies conditions which would potentially actuate the degraded voltage protection logic and initiate separation from an offsite power source upon a PNP trip concurrent with a loss of coolant accident (LOCA). Following a trip of the PNP unit, the TSO would typically increase generation elsewhere to restore the system to near nominal operating conditions precluding further long-term decrease in voltage. Such actions are under the control of the TSO.

Question 2	
on the grid.	
(d) If your TSO uses an analysis tool, how frequently does the analysis tool program update?	Based on discussions with the TSO, the Security Analysis program presently updates the PNP trip contingency on a 15 minute time interval. The analysis can also be initiated on demand. The MISO RTCA runs every 5 minutes.
(e) Provide details of analysis tool-identified contingency conditions that would trigger an NPP licensee notification from the TSO.	The only analysis-tool identified contingency which would trigger notification from the TSO or MISO is the voltage alarm generated by the PNP trip contingency.
(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 offsite power voltage and capacity could be inadequate? If so, how does the NPP licensee determine that the offsite power would remain operable when such a notification is received?	The agreement does not specifically require notification for periods of time when grid conditions are indeterminate. However, procedurally the TSO is required to notify PNP if the Security Analysis is not operating or considered unreliable. If informed by the TSO that the Security Analysis is unreliable, PNP defaults to grid system studies which identify the maximum expected voltage drop following a plant trip. This voltage is then used to determine operability of offsite power sources. The TSO can also call on the support of MISO to evaluate conditions and re-dispatch generation as required to support PNP's voltage. MISO actions to support PNP voltage requirements are provided in MISO Standard Operating Guide, "Palisades 345 kV Bus Voltage." Per the MISO Nuclear Plant Communication protocol, should the TO lose its ability to monitor or predict the operation of the transmission system affecting off-site power to the nuclear plant, the TO shall notify the MISO, validate MISO's ability to monitor and predict the operation of the

Question 2	
	transmission system and then communicate to the nuclear plant. TO will communicate to the nuclear plant and MISO when this capability is restored. This communication should be as soon as practicable or per established agreements with the TO. Should MISO lose its ability to monitor or predict the operation of the transmission system affecting off-site power to the nuclear plant, MISO shall notify the TO. The MISO has developed Abnormal Operating Procedures (AOPs) to guide its transmission system operation for failures of different components of analytical and communication tools. For loss of the MISO RTCA, MISO will consider the results of the local transmission operator's analytical tools. For loss of both sets of tools, MISO Operating Engineers will attempt to use off-line power flow tools to replicate operating conditions and predict contingent operation.
(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?	No. For post event analysis, the TSO does not verify by procedure the switchyard voltages are bounded by the analysis tools. There is no formal process for comparing the actual post-trip voltages to the post-trip contingency voltage results calculated by the MISO RTCA program. Because many of the MISO transmission owning member companies have similar RTCA programs, there are many opportunities to compare the results. This results in a high confidence that the RTCA results are accurate. However, if the resultant voltages are outside of the criteria, when they are predicted to be within, MISO would be initiating an investigation.
(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?	Not applicable to PNP since TSO analysis tools are presently in use.

Question 2	
(i) If an analysis tool is not available, does your TSO perform periodic studies to verify that adequate offsite 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? (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? (b) If the bounds of the analyses are exceeded, does this condition trigger the notification provisions discussed in question 1 above?	Not applicable to PNP since TSO analysis tools are presently in use.
(j) If your TSO does <u>not</u> use, or you do not have access to the results of an analysis tool,	Not applicable to PNP since the TSO utilizes analysis tools, performs periodic studies and communicates the applicable results to PNP.

Question 2	
or your TSO does not perform and make available to you periodic studies that determine the adequacy of offsite 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 offsite power system will be sufficiently reliable and remain operable with high probability following a trip of your NPP.	

Question 3	
3. Use of criteria and methodologies to assess whether the NPP's offsite power system and safety-related components will remain operable when switchyard voltages are inadequate.	
(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	In accordance with the requirements of PNP operating procedures related to station power, control room operators would declare the appropriate offsite power source inoperable if notified by the TSO that switchyard voltage, following a contingent trip of the PNP unit, would be inadequate to support LOCA loads concurrent with the unit trip.

Question 3	
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 offsite power system declared inoperable under the plant TSs? If not, why not?	The PNP operator is not notified by the TSO and would not declare the appropriate offsite power sources inoperable for a contingent loss of a transmission line or contingent loss of another generating facility. System studies performed by the TSO conclude that the system will remain stable following a trip of the largest generator, loss of a transmission line, or drop of the largest load. If any of these events were to occur in real time, the next running of the TSO Security Analysis or MISO RTCA would indicate if PNP's voltage would be impacted such that substation voltage would be unacceptable.
(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?	No. The plant accident analyses evaluate a loss of offsite power (LOOP) occurring coincident with various accidents. A postulated double sequencing event is outside the plant's licensing basis and has not been evaluated. Equipment operability is based on performance of safety functions and safety support functions required within the plant licensing basis.

Question 3	
If not, why not?	
(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).	Double sequencing is not in the PNP's licensing basis and PNP is not designed or analyzed for double sequencing scenarios
(d) If the NPP licensee is notified by the TSO of other grid conditions that may impair the capability or availability of offsite power, are any plant TS action statements entered? If so, please identify them.	No. Technical Specification Conditions are not entered for grid conditions that might occur. The PNP operator only declares offsite power sources inoperable when the predicted voltage following a unit trip is low enough to preclude initiation of LOCA loads concurrent with a unit trip.
(e) If you believe your plant TSs do not require you to declare your offsite 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	Not applicable to PNP since offsite power sources will be declared inoperable as described in the response to question 3(a) above in accordance with the plant licensing basis and Technical Specifications.

Question 3	
compensatory actions you intend to take to ensure that the offsite power system and safety-related components will remain operable when switchyard voltages are inadequate.	
(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).	The compensatory actions discussed in response to questions 3(a) through 3(e) involve entering Technical Specification Conditions. PNP operators are trained in the interpretation and use of plant Technical Specifications and associated compensatory measures.

Question 4	
4. Use of criteria and methodologies to assess whether the offsite power system will remain operable following a trip of your NPP.	
(a) Do the NPP operators have any guidance or procedures in plant TS bases sections, the final safety analysis report, or plant procedures regarding	Yes. Procedural guidance is available to PNP operators. PNP does not have voltage regulators, capacitors or static VAR compensators. As discussed in response to question 1(g), one source of offsite power is provided via a load tap changing transformer. Although procedures do not explicitly state that this source of offsite power is inoperable if the load tap changer is in manual, the procedure on station power

Question 4	
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 offsite power system? If so, describe how the operators are trained and tested on the guidance and procedures.	requires that the voltage on the bus be maintained within required limits. If the tap changer cannot maintain these voltage requirements, due to either the regulator being in manual or the tap changer being stuck, the source of offsite power would be declared inoperable. The North American Electric Reliability Council (NERC) requires that the TSO be notified if the main generator voltage regulator is placed in manual. Operation in this mode can result in the plant output not responding as assumed in the grid system planning analysis potentially resulting in decreased reliability of the grid. The NERC requirement assures that the TSO is aware of the potential for an unexpected response of the unit to grid upsets. The requirement to inform the TSO of the status of the voltage regulator is specified in the plant procedure on the main turbine and generating systems. Training on the guidance and procedures described above are discussed in response to question 1(d).
(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 offsite power system, explain why you believe you comply with the provisions of GDC 17 and the plant TSs, or describe what actions you	Not applicable. PNP does have procedural guidance that provides the operator with written direction for responding to equipment malfunctions and manipulation of controls that can adversely affect the operability of the PNP offsite power system.

Question 4	
intend to take to provide such guidance or procedures.	

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.

Question 5	
5. Performance of grid reliability evaluations as part of the maintenance risk assessments required by 10 CFR 50.65(a)(4).	
(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	Yes a qualitative evaluation is performed. 10CFR 50.65(a)(4) requires performance of a risk assessment prior to maintenance activities. Procedural requirements for performing the required risk assessment at PNP are included in a procedure regarding risk management and risk monitoring. This information is associated with the plant procedure specifying requirements for control of equipment. As regards grid risk sensitive maintenance, the procedure specifies that maintenance or testing on sensitive or critical equipment during periods of severe weather forecasts, grid voltage degradation, or system generation alert conditions should be avoided. This guidance would be considered prior to taking a risk-significant piece of equipment (such as an EDG, a battery, a steam-driven pump, or an alternate AC power source) out-of-service.

Question 5	
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?	
(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?	Yes. As discussed in the response to question 2(a), the TSO and MISO, through use of real time analysis, continuously monitor the status of the voltage within the PNP switchyard and notifies the plant if post plant trip contingency voltages would be below acceptable values. Such a notification would be considered an emergent condition. For emergent conditions, the PNP risk management guidelines discussed in response to the previous question requires that the risk impact be reassessed.
(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	No. Typically the grid carries more power during summer months due to heavier loading. However the stress on the grid is a function of what equipment is in service and the ability of the grid to handle the increased loading with respect to winter months. Existing procedures and protocols used by the TSO provide guidance on the grid operations to maintain grid reliability and stability. Offsite power to PNP is provided from a major METC 345KV switchyard located approximately

Question 5	
elements? 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.	one-half mile from the plant. The switchyard consists of six incoming transmission lines, 2 each from the east, north and south. In addition, there is an incoming line from a 1350 MW gas fired plant. These incoming lines and the PNP generator output are connected in a breaker and a half scheme powering two buses identified as Front ('F') and Rear ('R') bus. The two transmission lines from the south are the METC interconnection with American Electric Power (AEP). With the number of lines providing access to the grid, removal of a transmission line from service either within the Palisades Switchyard or elsewhere in the system does not result in a significant increase in grid stress near PNP. Prior to removal of lines from service, the impact on the grid, including PNP operating criteria, would be evaluated and approved by the MISO as discussed in the response to question 6(a). The overriding concern of the TSO is to maintain continued grid reliability/stability. To protect the grid, TSO procedures require that service to residential and commercial customers be reduced by first reducing voltage at the distribution level and if required, shedding load. The residential and commercial customers may experience electrical outages at the distribution level while the grid is unaffected. Hence, offsite power would continue to be available to PNP. Current industry data is inconclusive relative to the degree of seasonal variation in LOOP frequency. Because LOOP frequency for PNP is very low and because outages and maintenance are effectively managed, there is no identified seasonal variation in LOOP frequency. In response to this question, MISO performed a review of Energy Emergency Alerts, as defined in NERC Standard EOP-002-0, which have occurred within the MISO Reliability footprint. This review determined that there is no correlation between grid stress and seasonal load or maintenance activities.
(d) Are known time-related variations in the probability of a LOOP at your plant site considered in the grid-risk-	Seasonal variations in the LOOP probability are not significant at PNP and therefore do not provide a useable basis for determination of risk based solely on the season. Other time related variations such as system generation alert conditions, grid voltage degradation and severe weather are considered as part of risk management. For these conditions, procedural guidance is provided to the operators regarding actions to be taken to minimize risk.

Question 5	
sensitive maintenance evaluation? If not, what is your basis for not considering them?	
(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?	Yes. Switchyard activities are administratively controlled by procedure. This procedure identifies the interface arrangements between PNP and the various TSO operations, maintenance and test organizations. PNP maintains contacts with these various TSO organizations to coordinate maintenance and testing activities and to determine grid status. These organizations are specifically called upon when performing switchyard maintenance. Taking lines out of service in the switchyard always involves the coordination and direction of the TSO's System Control. System Control is the organization most knowledgeable of current system conditions. As regards maintenance of plant installed critical equipment, the need to request input from System Control as to current or projected grid conditions prior to performing risk sensitive maintenance activities would be dependent on grid conditions at the time. There are specific procedural requirements for times when PNP control room operators are required to contact the TSO System Control. These occur when the unit is unable to maintain their voltage schedule, or when voltage lowers to a trigger point where loss of the unit could potentially reduce voltage below the required minimum. As a result of the dynamic nature of loads and active generation on the power-grid, the TSO is only able to comment on the grid conditions shortly before (on the order of hours) maintenance tasks commence. The TSO can provide commentaries on grid conditions at any time maintenance tasks are underway. The same dynamic nature of loads and active generation make prediction of grid conditions days or weeks ahead of time highly uncertain.
(f) Describe any formal agreement or protocol that	The TSO will notify PNP in accordance with the agreement discussed in response to question

Question 5	
you have with your TSO to assure that you are promptly alerted to a worsening grid condition that may emerge during a maintenance activity.	1(a) based upon grid conditions described in the response to question 1(b) above. Additionally, MISO has established a communication protocol for nuclear power plants that requires the MISO to communicate to the local transmission owner (TSO) whenever the MISO has determined that the pre and/or post contingent voltage for the nuclear power plants is outside of the acceptable voltage range. These notifications would be provided to PNP whether or not maintenance is on-going.
(g) Do you contact your TSO periodically for the duration of the grid-risk-sensitive maintenance activities?	PNP does not contact the TSO solely based on the type of plant maintenance being performed. As described earlier, there are specific procedural requirements for times when PNP control room operators are required to contact the TSO System Control. These occur when the unit is unable to maintain their voltage schedule, or when voltage lowers to a point where loss of the unit could potentially reduce voltage below the required minimum.
(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.	There is no formal training provided to the plant operators and maintenance personnel on the details of the formal agreement between PNP and the TSO and/or MISO. Portions of the formal agreement which impact operations and/or maintenance have, however, been extracted from the agreement and incorporated into plant procedures. Training on this procedural material is provided as discussed below. Training on the maintenance rule, risk management and probabilistic safety assessment (PSA) is provided to plant operators as part of initial license training. This training is encompassed within the lesson plan entitled “Equipment Out of Service Overview.” This lesson plan provides the operators training on the EPRI developed “Equipment Out of Service” (EOOS) monitor. This monitor provides the operators with a risk score based on the PSA model. The EOOS system is provided with the capability to input grid conditions manually to account for potentially degraded grid conditions. Additional training is provided periodically as part of “Licensed Operator News” training. Recent training in this area was provided which addressed risk management.

Question 5	
	Additionally, as part of summer readiness training, the following topics are addressed: • Review of switchyard components and operation; • Review of symptoms of grid disturbance, and the potential affect on generator and generator auxiliaries; and • Review of station procedures for response to grid anomalies. No training is provided to maintenance personnel.
(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).	A formal agreement for communication exists which would result in notification of grid conditions that would be considered as part of maintenance risk assessment. Therefore, this question is not applicable.
(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	Not applicable to PNP. The TSO communicates grid conditions to the plant shift supervision and that information is incorporated into online risk assessments as described above (see answer to question 5(d)).

Question 5	
the relevant provisions of the endorsed industry guidance associated with the maintenance rule.	
(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.	No alternative actions to be taken.

Question 6	
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).	
(a) Does the TSO coordinate transmission system maintenance activities that can have an impact on the	Yes. PNP coordinates maintenance in the PNP switchyard with the TSO. Maintenance activities in the switchyard are controlled in accordance with PNP procedure on control of switchyard activities. The procedure outlines the planning and communication required for work to be performed to assure that the PNP Technical Specifications and operating

Question 6	
NPP operation with the NPP operator?	requirements for switchyard equipment are met. The procedure requires that the TSO inform PNP of schedules for performing work in the switchyard, and that the maintenance personnel contact PNP prior to removing equipment from service. With respect to transmission system maintenance beyond the PNP switchyard, MISO is responsible for approving the maintenance schedule of transmission facilities and coordinating the scheduling of generation facilities. The decision to approve transmission and generation facility maintenance schedules is based on the ability of the MISO to operate the system within the criteria set forth by the transmission owner, NERC and the applicable regional reliability coordinator. The outage scheduling process analyzes the outages under expected grid operating conditions. One day prior and on the outage day, the system is analyzed by MISO before permitting the equipment to be switched out of service. Once the equipment is switched out of service, grid status is automatically captured by the MISO SE and continually evaluated by the MISO RTCA program.
(b) Do you coordinate NPP maintenance activities that can have an impact on the transmission system with the TSO?	Short of inducing a trip of the main generator, no work at PNP is able to make a significant change to the status of the grid in the vicinity of the plant or the grid at-large. For activities that may result in a change in plant power output or have a higher risk of a plant trip, such as turbine valve testing, the TSO System Control would be notified prior to performing the activity.
(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	Yes. The PNP procedure on control of plant equipment identifies the actions to be taken when notified by Electric Source and Trading or the (TSO) System Control of a “System Critical” status due to generation or transmission availability constraints. When notified of this status, the procedure requires that maintenance on batteries, emergency diesel generators, and the auxiliary feedwater system be rescheduled. Additionally the procedure requires rescheduling activities that have the potential of causing a reactor trip such as reactor protective system testing, switchyard manipulations, turbine valve testing or feedwater heater

Question 6	
probability, or (iii) reduce LOOP or SBO coping capability) under existing, imminent, or worsening degraded grid reliability conditions?	level control manipulations.
(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.)	Yes. Risk management compensatory actions for higher risk activities are provided in "Risk Management and Risk Monitoring," guidelines. The actions identified within these guidelines include: 1. Actions to provide increased risk awareness and control: • Discuss planned maintenance activity with operating shift and obtain operator awareness and approval of planned evolution; • Conduct pre-job briefing of maintenance personnel, emphasizing risk aspects of planned maintenance evolution; • Request the system engineer or subject matter expert (SME) to be present for the maintenance activity, or applicable portions of the activity, and • Obtain plant management approval for the proposed activity. 2. Actions to reduce duration of maintenance activity: • Pre-stage parts and materials; • Walk-down tagout and maintenance activity prior to conducting maintenance; • Conduct training on mock-ups to familiarize maintenance personnel with the activity. • Perform maintenance around the clock; and • Establish contingency plans to restore out-of-service equipment rapidly.

Question 6	
	3. Actions to minimize magnitude of risk increase: • Minimize work in areas that could cause a plant trip or transient, or a loss of power (sub-station, switchgear rooms, or EDG rooms) to lower the frequency of initiating events that are mitigated by the safety function served by the out-of-service equipment; • Minimize other work in areas that could affect the redundant systems (place protected train boundaries); • Walk-downs of key safety systems by on-shift Senior Reactor Operator (SRO) personnel and management before and during higher risk evolutions: and • Increased surveillance frequencies of key safety functions by testing alternate equipment prior to the planned work or frequent inspections of standby equipment during work.
(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.	Actions to be taken are addressed within each of the responses to questions 6(a) through 6(d) above. The PNP procedures which control these activities are: Control of Plant Equipment; and Control of Switchyard Maintenance. NMC's management expectation is that procedural requirements be strictly adhered to.
(f) Describe how NPP operators and maintenance personnel are trained and	Training on the maintenance rule, risk management and PSA is provided to plant operators as part of initial license training. This training is encompassed within the lesson plan entitled "Equipment Out of Service Overview". This lesson plan provides the operators training on the

Question 6	
tested to assure they can accomplish the actions described in your answers to question 6(e).	EPRI EOOS monitor. This monitor provides the operators with a risk score based on the PSA model. The EOOS system is provided with the capability to input grid conditions manually to account for potentially degraded grid conditions. Additional training is provided periodically as part of "Licensed Operator News" training. Recent training in this area was provided which addressed risk management. Additionally, as part of summer readiness training, the following topics are addressed: • Review of switchyard components and operation; • Review of symptoms of grid disturbance, and the potential affect on generator and generator auxiliaries; and • Review of station procedures for response to grid anomalies. No training is provided to maintenance personnel on risk management.
(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).	Not applicable. There is effective coordination between PNP and the TSO regarding transmission system maintenance or PNP maintenance activities. Such coordination is in accordance with procedures and communication protocols.
(h) If you do not consider and effectively implement appropriate risk management	As discussed in response to questions 6(a) through 6(d), PNP effectively implements appropriate risk management actions.

Question 6	
actions during the conditions described above, explain why you believe you effectively addressed the relevant provisions of the associated NRC-endorsed industry guidance.	
(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).	No alternative actions to be taken.

Offsite 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.

Question 7	
7. Procedures for identifying local power sources that could be made available to resupply your plant following a LOOP event. Note: Section 2, "Offsite Power," of RG 1.155 (ADAMS Accession No. ML003740034) states: Procedures should include the actions necessary to restore offsite power and use nearby power sources when offsite power is unavailable. As a minimum, the following potential causes for loss of offsite 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	
(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.	PNP has a formal agreement with METC as discussed in response to question 1(a) above. The agreement requires that METC provide PNP the highest possible priority during Black Light Procedures for restoration of the Palisades Substation. Following a total system collapse (Black Light), the TSO System Restoration Manual provides for the use of a nearby black start capable pumped storage facility to provide power to the PNP switchyard. The following discussion of the region wide restoration process was provided by MISO: The MISO restoration process will provide the development of individual TSO Restoration Plans. MISO conducts reviews, workshops and drills to ensure the effectiveness of the restoration plan. The MISO restoration process will provide updates to the TO and PNP on transmission system status during emergency restoration, and will give the highest priority to restoring power to affected nuclear facilities per NERC standard EOP-005-0. However, due to the myriad of possible restoration scenarios, no specific power sources to re-supply PNP will be identified. The MISO restoration process allows for the fact that the blacked out area may or may not be separated from the remainder of the system. The MISO restoration process allows the use of black start unit or cranking path from the non-blacked out

Question 7	
	areas. Regardless of the scenario, there is a clear recognition of the importance of expeditious restoration of a nuclear power plant offsite power source.
(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.	The TSO is responsible for restoration of power to the Palisades Switchyard in the event of a LOOP. PNP operators are not trained on the specifics of restoring power to the switchyard. The operators are trained and tested on the use of the Emergency Operating Procedure (EOP) on Station Blackout Recovery. This training includes a simulator exercise on Station Blackout Recovery.
(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.	PNP has an established agreement with the TSO related to restoration of power to the PNP switchyard. Thus this item is not applicable.

Losses of offsite 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.

Question 8	
8. Maintaining SBO coping capabilities in accordance with 10 CFR 50.63.	
(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?	There have been no grid related losses of offsite power at PNP since the NRC Safety Evaluation Report on Station Blackout was issued on June 25,1992. (Reference Table A.1 NUREG/CR-6890, December 2005)
(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 offsite power design characteristic group?	Not applicable.
(c) If so, what were the results of this reevaluation, and did the initially determined coping duration for the NPP need to be	Not applicable.

Question 8	
adjusted?	
(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.	Not applicable.

Actions to ensure compliance	
9. If you determine that any action is warranted to bring your NPP into compliance with NRC	Based on the responses provided above, NMC considers that operation and maintenance of the PNP is in compliance with the noted regulatory requirements to the extent described in the plant's licensing basis.

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.	

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 offsite power systems under plant Technical Specifications. GDC 17, 10 CFR Part 50, Appendix A, 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).

Question 1	
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 offsite power systems under plant Technical Specifications.	
(a) Do you have a formal agreement or protocol with your TSO?	Yes. The Transmission System Operator (TSO) to which the Prairie Island Nuclear Generating Plant (PINGP) supplies power is owned and operated by Xcel Energy, Inc. PINGP is owned by Northern States Power Company (NSP), a wholly owned subsidiary of Xcel Energy, Inc. (Xcel), and operated by Nuclear Management Company, LLC (NMC). Although NMC is the plant operating entity, references to management actions on behalf of PINGP in the remainder of this document are referred to as PINGP. PINGP does have a formal agreement with the TSO (all references to “TSO”, “ISO”, “Reliability Controller or Control Center”, or “Balancing Authority” etc. throughout this document refer to Excel Energy’s Northern States Power System Control Center). The agreement is documented in the Voltage Support Agreement, June 12, 1990 and NMC – Xcel Nuclear Power Plant Operating Services Agreement, November 23, 1999.
(b) Describe any grid conditions that would trigger a notification from the TSO to the NPP licensee and if there	The TSO is required to notify PINGP whenever an impaired or potentially degraded grid condition is recognized by the TSO. Specific examples of known potentially degrading conditions identified in the agreement include:

Question 1	
is a time period required for the notification	1. If a Real Time Contingency Analysis (RTCA) post contingent alarm is received indicating that the post-trip grid voltage at the Prairie Island Substation will be below the calculated minimum voltage for the present plant substation lineup; and 2. If grid conditions, as established by Energy Supply (Energy Supply is the power marketing arm of NSP), enters into or leaves a system condition designated as orange or red. (These are the two most stressed grid conditions) The occurrence of a grid contingency that impacts PINGP requires immediate notification.
(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.	Grid conditions and status are the primary responsibility of the TSO and the Reliability Coordinator (RC). The grid parameters observable to the PINGP operator include only voltage and frequency, generator reactive output, breaker status, line status and certain switchyard alarm points. The TSO is contacted per procedure for response to any grid conditions that result in substation alarms. Plant Abnormal Operating Procedures (AOP) direct communication with the TSO in response to loss of major substation components. Relative to this question, “grid conditions” is assumed to be any changes within the jurisdiction of PINGP that impact the TSO analysis of the grid interface. The PINGP Shift Supervisor also notifies the TSO for changes in the following grid conditions: • Changes to switchyard voltage, switchyard breaker alignment that affects the RTCA setpoint as per operating procedure; • If generator real and reactive power loading must be changed due to generator limitations or plant maintenance; • Change in status of the 10 Bank Transformer offsite power voltage regulating devices (such as load tap changers (LTCs) in manual versus auto.); • Modifications resulting in changes to generator electrical characteristics or substation

Question 1	
	operating characteristics; and • Transfer of the generator voltage regulator to manual.
(d) Describe how NPP operators are trained and tested on the use of the procedures or assessing grid conditions in question 1(c).	Since 1996, PINGP has trained the operators annually on loss of offsite power on the simulator. PINGP has also taught on loss of all safeguards AC power recovery with and without safety injection, but this was on a 3-year frequency and was last discussed in 2004. The Loss of Grid INPO Significant Operating Event Report (SOER) was discussed by operations in 2002, 2003, and 2005 In 2005, classroom and simulator training included: • discussion of SOER 99-1, loss of grid events, and, SOER 02-3, transformer reliability; • virtual tour of the NSP System Control Center and the Mid-Continent Area Power Pool (MAPP) system. Plant operators interviewed TSO operators and asked what information the TSO operators like to hear from the plant control room during upset conditions; • reviewed work procedures for substation work; • discussed the plant response to degrading grid conditions and reviewed the system operating codes and the procedure for responding to degraded grid conditions using the plant station load reduction procedure; • during two simulator sessions in that same cycle, training focused on degraded grid conditions entering the system operating code procedure and the plant station load reduction procedure. This was followed by a loss of offsite power and other electrical switching operations. The crews had practice in implementing various plant electrical AOPs; • Switchyard distribution is taught on a 3 year frequency and was last taught in January of 2005;

Question 1	
	• Operators were evaluated on the simulator during a simulated loss of offsite power condition; • Training was conducted on motor and transformer theory; and • Transformer reliability was taught based on SOER 02-3 in 2002 which has been incorporated into the transformer lesson plan. Examples of training in 2004 include multiple simulator scenarios that used electrical switching as their base operation: (Listed are tasks trained on the simulator) • Loss of Offsite and Onsite Power; Response To Faulty Generator Voltage Regulator; Op Restrictions/Limitations Loss of 345 kV Bus 1 and 2; Loss of Offsite Power; Loss of All AC. Power Recovery w/o SI Required; Restart DG With Automatic Start Signal Present; • Reenergize a Dead 4.16 KV Bus; Response To Instrument Inverter Bypass; Response To Loss of an Instrument Bus; Op Restrictions/Limitations Loss of CT1/CT11/CT12 Transformers; • Response To System Underfrequency Disturbance: Operating Restrictions/Limitations Loss of 10 Bank Transformer; Response to a Loss of 1R/2RX/2RY; and • Rapid Load Reduction.
(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	PINGP does have a formal agreement with the TSO; thus, this question is not applicable.

Question 1	
compliance with GDC 17.	
(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).	As previously stated in response to question 1(a), PINGP does have a formal TSO agreement which ensures prompt communications between the TSO and the Shift Supervisor in the event of changes in the grid alignment that may affect the post contingent setpoint or result. Although the notification time is not specifically called out in the operating procedure, past practice has been to immediately notify the PINGP control room in the event of a post contingent voltage violation. An event notification (i.e., failure to meet minimum post contingent voltages) includes predicted post-trip voltage at the Prairie Island Substation. The TSO will also promptly notify PINGP when grid conditions become more stressed necessitating changes to the grid condition system operating code.
(g) Describe the low switchyard voltage conditions that would initiate operation of plant degraded voltage protection.	At PINGP, degraded voltage is not sensed in the switchyard. The degraded voltage protection scheme senses voltage at the 4.16 kV safety related buses. The two conditions at PINGP will initiate a degraded voltage logic initiation on the plant 4.16 kV Safeguards Buses are: • Bus undervoltage nominal allowable value: 75% with a fixed nominal time delay of 4 seconds. • Bus degraded voltage nominal allowable value: 95.5% with a nominal conditional time

Question 1	
	delay of 8 seconds (Safety Injection (SI) signal present) or 60 seconds (no SI signal present).

Question 2	
2. Use of criteria and methodologies to assess whether the offsite power system will become inoperable as a result of a trip of your NPP.	
(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 offsite 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.	Yes. The TSO makes use of analysis tools to predict grid conditions that would make the PINGP offsite power system non-functional. These tools are not available to the PINGP. The tools presently used by the TSO to manage the grid programs, control the transmission related activities, and monitor grid actions that are outside the control of the PINGP include the following: • a fully commissioned RTCA program; • a grid state estimator and System Control and Data Acquisition (SCADA) system in conjunction with periodic studies of a reasonable number of contingencies; and • bounding analyses. The following is a brief description of the RTCA operation: The Security Analysis (SA) is a real time load flow program that takes data from the SCADA network to establish the various state variable parameters required to analyze the network. Once all the state input data is set, the program calculates the voltages at all of the nodes in the network. As in any load flow analysis, the program may take a few iterations to reach a solution. For purposes of this explanation, this is referred to as the Base Real Time Analysis. Upon reaching the base solution the program then sequentially steps through a sequence of

Question 2	
	"N" contingencies to recalculate resultant node voltages for a series of "what if" scenarios. Each contingency calculation considers the loss of one of the major components in the base analysis at a time, hence the term N-1 Contingency Analysis. It calculates the resultant voltage at each node based on the loss of one of the components from the base real time solution. This list of contingencies may be several hundred elements long and runs immediately after the base solution is calculated. The contingency of primary concern to the nuclear plant is the trip of the plant and the effect on the resultant voltage at the plant's substation. For the purpose of this discussion this will be referred to as the Primary Contingency. For each of the N-1 contingencies, the resultant voltage at each of the nodes of concern is compared to pre-established voltage limits and if any voltage falls out of that range, the system operator receives an alarm. If an alarm is received upon running of the primary contingency the system operator is instructed to contact the nuclear plant in accordance with established protocols.
(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?	Yes. The TSO uses the above analysis tools, in conjunction with procedures, as the basis for determining when conditions warrant PINGP notification. Refer to the response to question 1(b).
(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	Yes. The TSO analysis tool, in conjunction with PINGP plant analysis, identifies contingent conditions which would actuate the PINGP degraded voltage protection logic and initiate separation from an offsite power source upon a postulated dual-unit PINGP trip. The RTCA predicts the loss of both units' generation and the immediate assumption of offsite support of auxiliary station loads. This is a static analysis that calculates a postulated post trip steady

Question 2	
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.	state voltage that is assumed constant. The brief description of how the RTCA functions provides insights that the analysis is valid only for a few minutes (on the order of 8 or 9 minutes) until the next data update and recalculation is run. The RTCA does not perform a "look ahead" calculation to determine post contingent voltages for projected grid conditions hours or days in advance. System wide studies that take into account projected plant outages, major transmission line maintenance, etc. are performed for market planning and for establishing a daily system condition. These studies are independent of the RTCA analysis.
(d) If your TSO uses an analysis tool, how frequently does the analysis tool program update?	The TSO RTCA program presently updates and recalculates the PINGP dual unit trip contingency on a time interval of approximately 7 to 8 minutes. The TSO SCADA information available as an input to the RTCA is essentially real time and provides updates to the RTCA each time it runs.
(e) Provide details of analysis tool-identified contingency conditions that would trigger an NPP licensee notification from the TSO.	The notification from the TSO is based upon the predicted post-trip switchyard voltage falling below the required voltage identified in plant operating procedures. PINGP operating procedures provide previously calculated setpoints dependent on plant internal load configuration.
(f) If an interface agreement exists between the TSO and the NPP licensee, does it	Yes. The agreement does specifically require PINGP notification for periods of time when the RTCA is out of service or grid conditions are indeterminate.

Question 2	
require that the NPP licensee be notified of periods when the TSO is unable to determine if offsite power voltage and capacity could be inadequate? If so, how does the NPP licensee determine that the offsite power would remain operable when such a notification is received?	PINGP follows plant abnormal operating procedure requirements when notified by the TSO that the RTCA is out of service or grid conditions are indeterminate. The abnormal operating procedures provide acceptable operating parameter guidelines to conservatively predict that post trip substation voltages, based on current real and reactive power conditions will remain above degraded voltage relay setpoints.
(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?	No. For post event analysis, the TSO does not verify by procedure the switchyard voltages are bounded by the analysis tools. However, post trip voltages are verified as being adequate as part of the plant emergency procedures for trip recovery and any low voltage conditions existing on the safeguards buses would be alarmed and the appropriate alarm response would be followed. Following an inadvertent trip of one or both PINGP units, any unexpected actuations or equipment operation associated with supply voltage would be documented and evaluated in accordance with the corrective action process.
(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?	Not applicable to PINGP since TSO analysis tools are presently in use.

Question 2	
(i) If an analysis tool is not available, does your TSO perform periodic studies to verify that adequate offsite 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? (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? (b) If the bounds of the analyses are exceeded, does this condition trigger the notification provisions discussed in question 1 above?	Not applicable to PINGP since TSO analysis tools are presently in use.
(j) If your TSO does <u>not</u> use, or you do not have access to the results of an analysis tool,	Not applicable to PINGP since the TSO utilizes analysis tools and communicates the applicable results to PINGP.

Question 2	
or your TSO does not perform and make available to you periodic studies that determine the adequacy of offsite 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 offsite power system will be sufficiently reliable and remain operable with high probability following a trip of your NPP.	

Question 3	
3. Use of criteria and methodologies to assess whether the NPP's offsite power system and safety-related components will remain operable when switchyard voltages are inadequate.	
(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	If notified that a contingent PINGP trip would drive voltage below the degraded voltage protection setpoint, the PINGP operator declares one or both offsite paths inoperable for postulated contingent dual unit trip per existing operating procedure and the PINGP operator would enter the applicable TS 3.8.1 Condition.

Question 3	
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 offsite power system declared inoperable under the plant TSs? If not, why not?	If a contingent line loss or the contingent loss of a remote generating unit would predict a post-trip voltage PINGP below the degraded voltage protection setpoint (e.g. an N-2 contingency evaluation), the PINGP operator would not enter any Technical Specification (TS) Conditions because Technical Specifications do not require entry into a TS Condition until an event actually happens.
(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?	The plant accident analyses evaluate a LOOP occurring coincident with various accidents. A postulated double sequencing event is outside the plant's licensing basis and has not been evaluated. Equipment operability is based on performance of safety functions and safety support functions required within the plant licensing basis

Question 3	
If not, why not?	
(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).	Double sequencing is not in the PINGP's licensing basis and PINGP is not designed or analyzed for double sequencing scenarios
(d) If the NPP licensee is notified by the TSO of other grid conditions that may impair the capability or availability of offsite power, are any plant TS action statements entered? If so, please identify them.	No. Technical Specification Conditions are not entered for grid conditions that might occur. The PINGP operator only declares offsite path(s) inoperable when the RTCA predicted voltage following a dual unit trip of PINGP is low enough to preclude initiation of loss of coolant accident (LOCA) loads concurrent with a dual unit trip.
(e) If you believe your plant TSs do not require you to declare your offsite 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	Not applicable to PINGP since offsite power sources will be declared inoperable as described in response to question 3(a) above in accordance with the plant licensing basis and Technical Specifications.

Question 3	
compensatory actions you intend to take to ensure that the offsite power system and safety-related components will remain operable when switchyard voltages are inadequate.	
(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).	The compensatory actions discussed in response to questions 3(a) through 3(e) involve entering Technical Specification Conditions. PINGP operators are trained in the interpretation and use of plant Technical Specifications and associated compensatory measures.

Question 4	
4. Use of criteria and methodologies to assess whether the offsite power system will remain operable following a trip of your NPP.	
(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	Yes. Procedural guidance is provided to the PINGP operators. The procedures require that the TSO be informed if the tap changer on 10 Bank Transformer is placed in manual and to do so only at the direction of the TSO so that the Security Analysis tool can be assessed for accuracy. In addition, procedural guidance is provided for the abnormal operating condition of taking the generator voltage regulator to manual which includes requirements to contact the TSO in such an event. Operator training is provided within the context of general training on specific systems and

Question 4	
-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 offsite power system? If so, describe how the operators are trained and tested on the guidance and procedures.	operating procedures.
(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 offsite 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.	Not applicable. PINGP does have procedural guidance that provides the operator with written direction for responding to equipment malfunctions and manipulation of controls that can adversely affect the operability of the PINGP offsite power system.

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.

Question 5	
5. Performance of grid reliability evaluations as part of the maintenance risk assessments required by 10 CFR 50.65(a)(4).	
(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-	Yes. The PINGP scheduling group ensures that all maintenance activities affecting grid reliability or equipment designed to mitigate loss of offsite power scenarios are assessed for their impact on risk before those activities are performed. As part of this assessment, grid reliability is considered and adjusted if appropriate (for severe weather, grid instability, or offsite supply lines unavailable). Maintenance activities associated with equipment supporting offsite power sources to the safeguards buses, such as removing a transformer have been determined to be significant and are quantitatively incorporated into online risk assessment calculations. Removal from service of any of the four 345 kV lines to the substation is also quantitatively included in the online risk assessment calculations. The scheduling group contacts the risk analysis group for support when a condition arises that requires a detailed assessment beyond the capability of the normal online assessment tool (EOOS, EPRI software program “Equipment Out Of Service” that is used to provide risk analysis for maintenance activities). Plant procedures that provide guidance on the assessment and management of risk associated with maintenance activities include EOOS software to model equipment configurations. This includes equipment (transformers, breakers) that forms the paths from the grid to the safety-related buses. When maintenance is being performed on one of the 345 kV lines, the EOOS variable

Question 5	
driven pump, an alternate AC power source) out-of-service?	"Environmental Variances - Switchyard Maintenance" is set to a specific multiplier as called out in the procedure. When maintenance is being performed on two of the 345 kV lines, the multiplier is set to a different value to account for the increased risk.
(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?	Yes. Per the responses provided in response to question 2, the grid status is continuously being monitored by the TSO with the operation of the RTCA. The TSO will inform the PINGP shift supervison if grid conditions significantly change that will place the grid into an elevated system condition or that the minimum post contingent substation voltage is not met. Changes to the grid conditions are monitored internally by the work week manager and the risk assessment would be revised accordingly in response to the changing or emergent grid conditions as reported by the TSO.
(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? Is there a seasonal variation (or the potential for a seasonal variation) in the LOOP frequency in the local transmission region?	Typically the grid carries more power during summer months due to heavier loading. However the stress on the grid is a function of what equipment is in service and the ability of the grid to handle the increased loading with respect to winter months. Existing procedures and protocols used by the TSO provide guidance on the grid operations to maintain grid reliability and stability. These guidelines include direction on adjustments of real and reactive power generation, load shedding, etc. to maintain a stable grid and reliable power to the PINGP. The overriding concern of the TSO is to maintain continued grid reliability/stability. To protect the grid, TSO procedures require that service to residential and commercial customers be reduced by first reducing voltage at the distribution level and if required, shedding load. The residential and commercial customers may experience electrical outages at the distribution level while the grid is unaffected. Hence, offsite power would continue to be available to PINGP. Current industry data is inconclusive relative to the degree of seasonal variation in LOOP

Question 5	
If the answer to either question is yes, discuss the time of year when the variations occur and their magnitude.	frequency. EPRI TR-1011759, dated December 2005 and EPRI TR-1009890, dated August 2004, have shown that there is no "statistically significant" seasonal-regional variation in recorded LOOP events from 1997 to 2004. Other recent documents and studies (i.e., NUREG/CR 6890) has indicated a "statistical significant" increase in frequency and associated CDF during summer months. Current PINGP data from EPRI TR-1009889 does not breakdown or quantify a daily time dependent or seasonal variation in LOOP probability.
(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?	The estimated likelihood of losing offsite power to PINGP is adjusted for certain conditions, such as degraded grid stability, severe weather, and maintenance activities that impact offsite power reliability, and this adjusted offsite power reliability information is factored into the online risk monitoring tool for quantitative risk assessments. The thresholds for implementing quantitative adjustments to the online risk assessments are fairly well established, but some conditions may arise that need to be addressed on a case by case basis. PINGP adjusts the loss of offsite power (LOOP) frequency when grid stability degrades to a red level, as defined by the TSO. Nominal values are used when grid stability is green, yellow or orange. The frequency of offsite power loss is adjusted (quantitatively assessed in the online risk monitoring model) for tornado, severe thunderstorm or high wind watches. Less severe conditions are treated on a case by case basis, and may be quantitatively assessed if conditions are determined to warrant an adjustment. The online risk analysis model incorporates maintenance activities that remove the 345 kV lines to the substation from service or remove components such as transformers, or isolate breakers from offsite power lines that supply the safeguards buses. Passive activities such as "working in the substation area" are qualitatively assessed and generally determined to have a negligible impact on risk. PINGP makes no adjustments to the loss of offsite power estimates as a function of time of day, day of week, or season.

Question 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?	Yes. The NSP TSO informs PINGP of planned maintenance through NSP's Transmission Work Request (TWR) process. If unplanned conditions take out a PINGP 345 kV transmission line, the NSP TSO will also inform the PINGP control room. PINGP procedures require the NSP TSO to inform PINGP shift supervision if the N-1 contingent voltage goes below the setpoint for a dual unit PINGP trip or if grid conditions change that may require suspension or postponement of maintenance and/or surveillance procedures affecting grid sensitive equipment. Other maintenance activities that could result in a trip of PINGP or grid instabilities are not specifically coordinated with the TSO; however these activities are reviewed for risk sensitivity as described in 5(a) and 6(c).
(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.	The TSO will notify PINGP in accordance with the agreement discussed in response to question 1(a) based upon grid conditions described in the response to question 1(b) above. These notifications would be provided to PINGP whether or not maintenance is on-going. The type of alerts provided to the PINGP conforms to the accepted practice promulgated by the North American Electric Reliability Council (NERC). Important alerts such as the one suggested by this question would be made to all generators in the control area. Changes to the grid operations, transmission lines out of service, generators taken off line, etc. are provided as real-time inputs to the RTCA via the SCADA system. Any change to the actual grid configuration that will cause a change in the grid system conditions codes or the dual unit post trip substation voltage to not meet degraded voltage requirements will trigger immediate notification to the Shift Supervisor from the TSO.
(g) Do you contact your TSO periodically for the duration of the grid-risk-sensitive	No, per the discussion in response to question 5(b). The TSO will inform the PINGP of any significant changes in the grid condition. Planned grid-risk sensitive maintenance activities are identified beforehand to the TSO via the TWR notification as described in response to

Question 5	
maintenance activities?	question 5(e). Also plant surveillance and maintenance activities are reviewed when grid conditions may change as described in response to question 6(c).
(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.	There is no formal training provided to the plant operators and maintenance personnel on the details of the formal agreement between PINGP and the TSO and/or MISO. Portions of the formal agreement which impact operations and/or maintenance have, however, been extracted from the agreement and incorporated into plant procedures. Training on this procedural material is provided as discussed below. Senior Rector Operators (SROs) have been trained in risk management and operability determination over the past few years at PINGP. This training has not been specific to the electrical grid, but has trained the SROs in the methodology that would be used when presented with the conditions stated above. Operators were trained on the addition of switchyard maintenance to EOOS for doing a probabilistic risk assessment (PRA). No training is provided to maintenance personnel.
(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).	A formal agreement for communication exists which would result in notification of grid conditions that would be considered as part of maintenance risk assessment. Therefore, this question is not applicable.

Question 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.	Not applicable to PINGP. The TSO communicates grid conditions to the plant shift supervision and that information is incorporated into online risk assessments as described above (see answer to question 5(d)).
(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.	No alternative actions to be taken.

Question 6	
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).	
(a) Does the TSO coordinate transmission system maintenance activities that can have an impact on the NPP operation with the NPP operator?	Yes. The NSP TSO informs PINGP of planned maintenance through NSP's TWR process. If unplanned conditions take out a PINGP 345 kV transmission line, the NSP TSO will also inform the PINGP control room. PINGP procedures require the NSP Transmission System Operator (TSO) to inform the PINGP control room if the contingent voltage goes below the setpoint for a dual unit PINGP trip. If this situation develops, PINGP declares the affected path from the grid (TS 3.8.1 Condition A) inoperable.
(b) Do you coordinate NPP maintenance activities that can have an impact on the transmission system with the TSO?	Yes. See protocols as referenced in Question 1(a) and response to question 5(e). PINGP informs the NSP TSO of planned maintenance through NSP's TWR process. It should be noted that this would apply to maintenance of substation transformers, breakers and other equipment in the substation that is owned and maintained by Xcel, the parent utility that also operates the transmission system.
(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	Yes. Although rescheduling is not in the Maintenance Rule definitions, the risk informed Maintenance Rule allows many choices. Grid-risk sensitive maintenance is performed when the on-shift personnel conclude that the risk of the work is small compared to the safety benefit. When the maintenance work is done in response to a Technical Specification, the risk assessment is informative for sequencing tasks, but not controlling. Emergent issues with the grid are managed to maintain a high level of plant safety. When notified of elevated grid color code, appropriate management means rescheduling activities altogether, at other times the shift-supervisor will order the on-shift maintenance staff to back

Question 6	
capability) under existing, imminent, or worsening degraded grid reliability conditions?	out of the task and restore the safety-related function of the equipment until the grid awareness conditions have reduced. As described in in response to questions 5(a) through 5(g) above, the risk assessment and the continuous monitoring of grid conditions will cause PINGP move activities into and out of the maintenance schedule as required to either minimize the risk or manage the risk with appropriate compensatory actions.
(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.)	Yes. All grid-risk sensitive maintenance activities are subject to a rigorous review prior to work start as outlined in various PINGP and TSO procedures and guidance documents per the interface agreement. Xcel grid (transmission/generation) system status color codes provide an indication of grid status. This code is based on the combination of: 1) system generation availability versus demand; and 2) transmission system load versus operating limits. A color code of Green indicates normal system status. Yellow is a warning status. Orange is a danger status. Red is an emergency status. PINGP's work management group utilizes the EOOS software program (described in response to question 5) to determine the probability of a core damaging event based on plant and grid configurations during the maintenance activities. The small probability of the loss of the grid system when the status changes from green to yellow has been determined to be negligible. However; the likelihood of a loss of offsite power is assessed to be significantly higher when the grid system status is changed to orange or red. If there is an overriding need to perform or continue in progress work during imminent or degraded grid conditions, then, written guidance would direct the necessary actions to be taken for the given system condition code.
(e) Describe the actions	Actions to be taken are addressed within each of the responses to questions 6(a) through 6(c)

Question 6	
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.	above. The procedures that govern these actions are also discussed in the same responses. Strict procedure adherence is an expectation of both NMC and Xcel management. For 6(d), the risk management procedure at PINGP directs that additional risk evaluations be performed taking into account elevated grid conditions (described as yellow, orange or red) as provided by the TSO to assess the core damage frequency (CDF) associated with the proposed maintenance activity. A similar maintenance risk color identifier is assigned (per the EOOS evaluation) to the unit for equipment out-of-service configuration based on the configurations of both plant and grid to establish a specific CDF. A maintenance risk color category of red indicates that the risk rate is too high, and must be reduced immediately by placing equipment back in service or by implementing contingency or compensatory measures. The color category actions are assigned based on the length of the risk-informed allowable out-of-service time, as follows: • Red – Do not voluntarily enter these configurations. Plant Operations Review Committee must authorize operation for any length of time in this condition. Immediately restore equipment to service, or implement risk management actions to restore at least an orange color category. • Orange – Plant Manager approval required to commence planned activity. • Yellow – Shift Manager approval required to commence planned activity. • Green – Normal work control procedures apply. Maintenance activities performed by Xcel on grid reliability sensitive equipment are also governed by similar restrictions based on the system condition color code and are coordinated with plant maintenance or curtailed appropriately, and specific elevated grid condition operating procedures are initiated depending on the severity of the system code. By maintaining the lowest out-of-service times and the lowest CDF risk with appropriate risk informed decisions, reasonable assurance is provided that grid sensitive maintenance activities will be effectively managed.

Question 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).	SRO's have been trained in risk management and operability determination over the past few years at PINGP. This training has not been specific to the electrical grid, but has trained the SRO's in the methodology that would be used when presented with the conditions stated above. Operators trained on the addition of switchyard maintenance to EOOS for doing PRA. No training is provided to maintenance personnel related to this question.
(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).	Not applicable. There is effective coordination between PINGP and the TSO regarding transmission system maintenance or PINGP maintenance activities. Such coordination is in accordance with procedures and communication protocols.
(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	As discussed in response to questions 6(a) through 6(d), PINGP effectively implements appropriate risk management actions.

Question 6	
guidance.	
(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).	No alternative actions to be taken.

Offsite 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.

Question 7
7. Procedures for identifying local power sources that could be made available to resupply your plant following a LOOP event. Note: Section 2, “Offsite Power,” of RG 1.155 (ADAMS Accession No. ML003740034) states: Procedures should include the actions necessary to restore offsite power and use nearby power sources when offsite

Question 7	
power is unavailable. As a minimum, the following potential causes for loss of offsite 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	
(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.	PINGP is also owned by the parent owner of the grid TSO; therefore no formal agreements exist other than the agreements identified in response to question 1(a). The Xcel Corporate System Restoration Plan states in Section 7.2 that, "The nuclear plants could receive auxiliary power as soon as the system and frequency stabilize. However, if either or both nuclear sites were to request power because of failures or problems with their emergency station generators, power would be routed to their respective substations". The plant would get top priority for restoration of offsite power if the emergency diesel generators were not operable. The priority would not be for re-starting the plant, but rather to restore power to the safe shutdown equipment. The TSO will utilize the best sources available for specific events to restore offsite power and to determine the specific power sources and paths, since there is no way to predict the extent and characteristics of a specific blackout. The TSO has many options available to restore offsite power and would not be limited to owner controlled local power sources. It should be noted that due to the indeterminate nature of a LOOP, the actions that could take place in the event of a LOOP at PINGP are not prescriptively identified in any procedure.
(b) Are your NPP operators trained and tested on identifying and using local power sources to resupply your plant following a LOOP	The TSO is responsible for restoration of power to the Prairie Island Substation in the event of a LOOP. PINGP operators have been trained to use Emergency Operating Procedures (EOPs) and AOPs to address issues related to the grid and to restoration of power to the essential buses in the event of a LOOP. This is comprised of classroom training on the abnormal procedures

Question 7	
event? If so, describe how.	and training in the Simulator.
(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.	PINGP is an asset owned by the same company that owns and operates the Transmission System and has established agreements to maintain adequate voltage and current support as described in response to question 1(a). The TSO has the responsibility to restore offsite power to PINGP as a priority as described in response to question 7(a). Identifying local power sources that could be made available to resupply power to PINGP following a LOOP is not part of the PINGP licensing basis. The requirement for procedures to restore AC power to PINGP is met by providing instructions to the system dispatcher to give the highest possible priority for restoring offsite power to PINGP in the event of a grid collapse and a simultaneous loss of emergency diesel generators (EDGs) at the site. The TSO System restoration and blackout procedures also contain this guidance and identify initial power sources for restoration. The TSO is required by NERC standards to maintain a system restoration plan. The plan provides for priority restoration of power to nuclear units in the event of a system blackout. PINGP's SBO and LOOP Abnormal Operating Procedures provide for communication between the system operator and PINGP Operations with regard to efficient restoration of AC power from the grid. Load restoration at the plant level is also addressed within the SBO and LOOP AOPs.

Losses of offsite 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.

Question 8	
8. Maintaining SBO coping capabilities in accordance with 10 CFR 50.63.	
(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?	One, due to weather related conditions external to the plant. Refer to LER 1996012. It should be noted, however, that one 345 kV line and one 161 kV line remained energized throughout the event maintaining some limited power to the non-safeguards buses throughout the event.
(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 offsite power design characteristic group?	No. Following the guidance of NUMARC 87-00 used in the original SBO classification, PINGP remains classified in Severe Weather (SW) Group 2 since the annual expectations for snow, tornadoes and severe storms has not changed; therefore, no reevaluation was required.
(c) If so, what were the results of this reevaluation, and did the initially determined coping duration for the NPP need to be adjusted?	No reevaluation was required since the annual expectations for snow, tornadoes and severe storms have not changed.
(d) If your NPP has	Per the guidance of NUMARC 87-00, PINGP remains classified as SW Group 2 since the

Question 8	
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.	annual expectations for snow, tornadoes and severe storms have not changed; therefore, PINGP remains in compliance with the provisions of 10 CFR 50.63.

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	Based on the responses provided above, NMC considers that operation and maintenance of the PNP is in compliance with the noted regulatory requirements to the extent described in the plant's licensing basis.

or 10 CFR 50.120, describe the schedule for implementing it.	

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 offsite power systems under plant Technical Specifications. GDC 17, 10 CFR Part 50, Appendix A, 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).

Question 1	
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 offsite power systems under plant Technical Specifications.	
(a) Do you have a formal agreement or protocol with your TSO?	Yes. The Transmission System Operator (TSO) to which the Monticello Nuclear Generating Plant (MNGP) supplies power is owned and operated by Xcel Energy, Inc. (Xcel). MNGP is owned by Northern States Power Company (NSP), a wholly owned subsidiary of Xcel Energy, Inc. (Xcel), and operated by Nuclear Management Company, LLC (NMC). Although NMC is the plant operating entity, references to management actions on behalf of MNGP in the remainder of this document are referred to as MNGP. The MNGP formal agreement with the TSO (all references to “TSO”, “ISO”, “Reliability Controller or Control Center”, “System Operation”, “Delivery System Operations”, “Energy Supply”, “Balancing Authority”, etc. throughout this document refer to Xcel Energy’s Northern States Power System Control Center) is documented in “Nuclear Power Plant Operating Services Agreement between Northern States Power Company and Nuclear Management Company, LLC for the Monticello Nuclear Generating Plant”.
(b) Describe any grid conditions that would trigger a notification from the TSO to	The TSO is required to notify MNGP in the event of changes in the transmission system lineup or conditions that could affect plant and offsite source reliability and availability.

Question 1	
the NPP licensee and if there is a time period required for the notification	There are triggering conditions that cause the TSO to notify MNGP of potential or developing grid instabilities in the area of voltage control limits or voltage rate of change for their transmission lines. Procedures direct the TSO to inform MNGP of tightening energy and capacity situations and put the facility on notice that the grid is being stressed or the potential for disturbances is imminent. An operating guide directs the TSO to notify MNGP shift supervision of a contingency condition that would result in MNGP degraded voltage conditions if it occurs. Specific examples of potentially degrading conditions identified in the agreement include: 1. If a Real Time Contingency Analysis (RTCA) post contingent alarm is received and cannot be cleared by system operator action indicating that the post-trip grid voltage at the MNGP substation will be below the calculated minimum voltage for the present plant substation lineup; and 2. If grid conditions, as established by Energy Supply, enters into or leaves a system condition designated as orange or red. (These are the two most stressed grid conditions).
(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.	Grid conditions and status are the primary responsibility of the TSO and Reliability Coordinator. The MNGP process computer continuously displays the 345 kV and 115 kV voltages, allowing for continuous monitoring by the plant operating staff. An alarm will annunciate if the voltages approach unacceptable levels. In addition, the 345 kV frequency is monitored and a low frequency generates an alarm on a plant main control room panel. The TSO is contacted per procedure for response to any grid conditions that result in substation alarms. These procedures include computer alarm and annunciator response procedures as well as Operations Manual procedures. In addition, Plant Abnormal Operating Procedures (AOP) direct communication with the TSO in response to loss of major substation components.

Question 1	
(d) Describe how NPP operators are trained and tested on the use of the procedures or assessing grid conditions in question 1(c).	Licensed Operator Training includes the following: Initial Training: The following material is presented in the classroom and tested by written exam per program requirements: • Main Generator: discuss the requirements for actions should transformer voltages (1R, 2R, or 1AR) be outside required action levels. Also discussed is MNGP's response to system underfrequency conditions and the actions that MNGP can take to increase plant reactive loading while remaining within the generator capacity curve; • Substation: discuss the requirement for actions should MNGP be notified by the TSO of a 345 KV or a 115 KV System Contingency Voltage Notification, as described in 1(b) above; • 4160 V system: discuss the requirements, precautions and actions for a system undervoltage situation; and • Station Electrical Blackout (SEBO): discuss the bases and development of the Xcel response procedures to grid related problems. The following are simulator sessions in the Initial Training Program that get evaluated in the simulator per program requirements: • Degrading Grid (DG) Test, Degrading Grid and Loss of Offsite Power: This simulator session focuses on degrading grid conditions and operator actions required by these conditions. This simulator scenario degrades to the point of a complete loss of offsite power and interaction with the TSO; and • Loss of Normal Offsite Power (LONOP) due to grid instability: This exercise simulates grid conditions present in the 2003 Northeast Blackout event and operator response. Licensed Operator Requalification Training: In 2005 the following training was presented:

Question 1	
	Both classroom training on the Northeast Blackout of 2003 and actions taken to prevent the same occurrence here included review of procedures for degrading transformer/grid voltages and the actions required at MNGP, and newly installed breakers in the switchyard including operation and alarms. Dynamic simulator training was conducted emphasizing degrading grid conditions. Training also included a discussion of voltage regulator and grid interaction, and loading capabilities of the turbine generator using the operating curves. Plans for future continuing training include degraded voltage conditions.
(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.	MNGP does have a formal agreement with the TSO; thus, this question is not applicable.
(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	As previously stated in response to question 1(a), MNGP does have a formal TSO agreement. Procedures exist that address the interface between the grid operator and MNGP. The TSO is required to promptly notify MNGP shift supervision in the event of changes in the transmission system lineup or conditions that could affect plant and offsite source reliability and availability. A procedure directs the TSO to inform MNGP of tightening energy and capacity situations which will put the facilities on notice that the grid is being stressed or the potential for disturbances is imminent. This notification would come in advance of any MNGP substation voltages approaching a value that would result in actuation of degraded voltage protection. In addition, the TSO continually monitors the grid for contingency conditions utilizing an RTCA

Question 1	
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).	program. The TSO would inform MNGP if the contingency analysis results indicate the plant would experience degraded voltage following a trip of MNGP, loss of MNGP Substation 10 Transformer, or other contingency, and the contingency condition voltages cannot be corrected by system operator action.
(g) Describe the low switchyard voltage conditions that would initiate operation of plant degraded voltage protection.	At MNGP, degraded voltage is not sensed in the switchyard. The degraded voltage protection scheme senses voltage at the essential plant 4.16 kV buses. MNGP has maintained load flow calculations to ensure that the Technical Specification's offsite power source minimum voltage levels are adequate for station lineups under worst case loading and motor starting conditions: Degraded voltage relay nominal set point: 3915 Volts on 4.16 kV nominal system voltage; and Nominal time delay: 9 seconds. Degraded voltage protection will not initiate as long as switchyard voltages do not fall below the following values: 1. When supplied by the preferred source (2R Transformer): 115 kV system voltage < 114.7 kV or 345 kV system voltage < 342 kV; or 2. When supplied by the non-preferred source (1R Transformer): 115 kV system voltage < 116 kV or 345 kV system voltage < 342 kV. Under the worst case loading on the plant auxiliary electrical system, these conditions would initiate operation of the plant degraded voltage protection.

Question 2	
2. Use of criteria and methodologies to assess whether the offsite power system will become inoperable as a result of a trip of your NPP.	
(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 offsite 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.	Yes. The TSO makes use of analysis tools to predict grid conditions that would make the MNGP offsite power system inoperable. These tools are not available to the MNGP. The tools presently used by the TSO to manage the grid programs, control the transmission related activities, and monitor grid actions include the following: • a fully commissioned RTCA program; • a grid state estimator and System Control and Data Acquisition (SCADA) system in conjunction with periodic studies of a reasonable number of contingencies; and • bounding analyses. The following is a brief description of the RTCA operation: The Security Analysis (SA) is a real time load flow program that takes data from the SCADA network to establish the various state variable parameters required to analyze the network. Once all the state input data is set, the program calculates the voltages at all of the nodes in the network. As in any load flow analysis, the program may take a few iterations to reach a solution. For purposes of this explanation, this is referred to as the Base Real Time Analysis. Upon reaching the base solution the program then sequentially steps through a sequence of "N" contingencies to recalculate resultant node voltages for a series of "what if" scenarios. Each contingency calculation considers the loss of one of the major components in the base analysis at a time, hence the term N-1 Contingency Analysis. It calculates the resultant voltage at each node based on the loss of one of the components from the base real time solution. This list of contingencies may be several hundred elements long and runs immediately after the base solution is calculated. The contingency of primary concern to the nuclear plant is the trip of the plant and the effect on the resultant voltage at the plant's

Question 2	
	substation. For the purpose of this discussion this will be referred to as the Primary Contingency. For each of the N-1 contingencies, the resultant voltage at each of the nodes of concern is compared to pre-established voltage limits and if any voltage falls out of that range, the system operator receives an alarm. If an alarm is received upon running of the primary contingency and cannot be cleared by system operator action, the system operator is instructed to contact the nuclear plant in accordance with established protocols.
(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?	Yes. The TSO uses the above analysis tools, in conjunction with procedures, as the basis for determining when conditions warrant MNGP notification.
(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	Yes. The TSO analysis tool, in conjunction with MNGP analysis, identifies conditions which <u>may</u> actuate the MNGP degraded voltage protection logic and initiate separation from an offsite power source upon a MNGP trip. The RTCA program used by the TSO analyzes the grid for the current real time conditions with one contingency condition and alarms if the MNGP switchyard voltage levels would be below the thresholds established by MNGP (outlined in the response to question 1(g)) for one or more contingencies. The established switchyard voltage thresholds are the levels at which the 4.16 kV essential bus voltage levels would dip within the analytical limits (3897 – 3933 V) of the degraded voltage set point. Two of the many contingencies used in the analysis are (1) the loss of MNGP generation and (2) the loss of MNGP switchyard 345/115 kV transformer (10 Transformer).

Question 2	
actuation of plant degraded voltage protection? If not, discuss how such a condition would be identified on the grid.	.
(d) If your TSO uses an analysis tool, how frequently does the analysis tool program update?	The TSO RTCA program presently updates and recalculates the MNGP trip contingency on a time interval of approximately 7 to 8 minutes. The TSO SCADA information available as an input to the RTCA is essentially real time and provides updates to the RTCA each time it runs.
(e) Provide details of analysis tool-identified contingency conditions that would trigger an NPP licensee notification from the TSO.	The notification from the TSO is based upon the predicted post-trip or other contingency switchyard voltage given actual (RTCA) grid conditions. The RTCA tool applies the real time actual conditions of the grid to the analysis with one of the major grid components (generating unit, transmission line, or transformer) removed. The tool will then generate an alarm if the resultant voltages at the MNGP substation 10 Transformer or MNGP generator do not meet the following thresholds: • 342 kV on the 345 kV system; • 114.7 kV on the 115 kV system when the plant is on its preferred source; and • 116 kV on the 115 kV system when the plant is on its non-preferred source. If an alarm is generated for a MNGP voltage threshold violation, the TSO operator procedurally attempts to restore the post-contingency predicted MNGP switchyard voltage levels. If the system changes do not restore the post-contingency predicted voltage levels, then the operator notifies the MNGP control room.

Question 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 offsite power voltage and capacity could be inadequate? If so, how does the NPP licensee determine that the offsite power would remain operable when such a notification is received?	Yes. The agreement specifically requires MNGP notification when grid conditions are indeterminate for 90 minutes or greater. MNGP follows Technical Specification's requirements when notified by the TSO that grid conditions are indeterminate. Operating procedures would be followed if this occurs. Voltage is also monitored at the 4.16 KV buses and appropriate actions are defined in Plant Operations Manual procedures for operator action if voltage limits are not met at this system level.
(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?	No. For post event analysis, the TSO does not verify by procedure the switchyard voltages are bounded by the analysis tools. Following an inadvertent trip of MNGP, any unexpected actuations or equipment operation associated with supply voltage would be documented and evaluated in accordance with the corrective action process.
(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,	Not applicable to MNGP since TSO analysis tools are presently in use.

Question 2	
when?	
(i) If an analysis tool is not available, does your TSO perform periodic studies to verify that adequate offsite 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? (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? (b) If the bounds of the analyses are exceeded, does this condition trigger the notification provisions discussed in question 1 above?	Not applicable to MNGP since TSO analysis tools are presently in use.
(j) If your TSO does <u>not</u> use,	Not applicable to MNGP, since the TSO utilizes analysis tools and communicates the

Question 2	
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 offsite 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 offsite power system will be sufficiently reliable and remain operable with high probability following a trip of your NPP.	applicable results and alarms to MNGP.

Question 3	
3. Use of criteria and methodologies to assess whether the NPP's offsite power system and safety-related components will remain operable when switchyard voltages are inadequate.	
(a) If the TSO notifies the NPP operator that a trip of the NPP, or the loss of the	Yes. MNGP Technical Specification's requirements are that at least two transmission lines, associated switchgear, and at least two offsite power sources (2R and 1R, or 1R and 1AR, or

Question 3	
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 offsite power system declared inoperable under the plant TSs? If not, why not?	2R and 1AR transformers) are fully operational and energized to carry the 4160 V AC buses. If notified by the TSO of a contingency voltage alarm, the MNGP control room operator by procedure declares offsite power sources inoperable for the following conditions: For a 345 kV contingency voltage threshold violation, if the contingency is loss of MNGP generation, the 2R transformer is declared inoperable. For a 115 kV contingency voltage threshold violation: • If the contingency is loss of MNGP generation and the contingency voltage is less than or equal to 114.7 kV, then the 1R transformer is declared inoperable; and • If the contingency is loss of 10 transformer, and the contingency voltage is less than or equal to 114.7 kV, then the 1R transformer and 1AR transformers are not considered redundant, and 1R or 1AR is declared inoperable. MNGP Technical Specifications and procedures do not require declaring the offsite sources inoperable for other contingencies such as loss of a transmission line or a contingency loss of the largest supply to the grid.
(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	The plant accident analyses evaluate a loss of offsite power (LOOP) occurring coincident with various accidents. A postulated double sequencing event is outside the plant's licensing basis and has not been evaluated. Equipment operability is based on performance of safety functions and safety support functions required within the plant licensing basis.

Question 3	
actuation signal during this condition, is the equipment considered inoperable? If not, why not?	
(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).	Double sequencing is not part of MNGP's licensing basis and MNGP is not designed or analyzed for double sequencing scenarios.
(d) If the NPP licensee is notified by the TSO of other grid conditions that may impair the capability or availability of offsite power, are any plant TS action statements entered? If so, please identify them.	No. Technical Specification Conditions are not entered for grid conditions that might occur. The MNGP operator only declares offsite power sources inoperable when the predicted voltage following a unit trip is low enough to preclude initiation of loss of coolant accident (LOCA) loads concurrent with a unit trip.
(e) If you believe your plant TSs do not require you to declare your offsite power system or safety-related equipment inoperable in any of these circumstances, explain why you believe you	Not applicable to MNGP since offsite power sources will be declared inoperable as described in 3(a) above in accordance with the plant licensing basis and Technical Specifications.

Question 3	
comply with the provisions of GDC 17 and your plant TSs, or describe what compensatory actions you intend to take to ensure that the offsite power system and safety-related components will remain operable when switchyard voltages are inadequate.	
(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).	Training on compensatory actions is encompassed within the response to question 1(d).

Question 4	
4. Use of criteria and methodologies to assess whether the offsite power system will remain operable following a trip of your NPP.	
(a) Do the NPP operators have any guidance or procedures in plant TS bases	Yes. Procedural guidance is provided to the MNGP operators. The operators are provided with written direction for responding to equipment malfunctions and manipulation of controls that can adversely affect the operability of the MNGP offsite power system. The following list

Question 4	
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 offsite power system? If so, describe how the operators are trained and tested on the guidance and procedures.	includes examples of, but does not include all procedural guidance associated with this question. • 345kV BUS VOLTAGE LOW/HIGH; • 115kV BUS VOLTAGE LOW/HIGH; • 345kV & 115kV YARD TROUBLE; • 1 GEN U.F. RELAY OPERATION; • NO. 1 GEN MAX EXC TRIP; • 1-BUS 345kV LOW FREQUENCY; • NO. 2R XFMR TROUBLE; • 1AR TRANS TROUBLE; • 1AR TRANS GROUND; • NO. 1 RES TRANS TROUBLE; • Removal of Automatic Voltage Regulator While on Line; • Restoration of the Automatic Voltage Regulator While on Line; • Faulty Voltage Regulator; • Loss of Gen Field Current; • 115kV System Contingency Voltage Notification; • 345kV System Contingency Voltage Notification; • Loss or Partial loss of 10 Transformer Cooling; • 345kV System Contingency Voltage Notification; • Loss of 10 Transformer;

Question 4	
	• Voltage Outside Operating Action Levels for Standby Power Sources; • Voltage Outside Operating Action Levels With Power Supplied From 1R Transformer; and • Voltage Outside Operating Action Levels With Essential Buses Supplied Power From 1AR Transformer. Licensed Operator Training for these conditions is encompassed in the response to question 1(d).
(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 offsite 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.	Not applicable. MNGP does have procedural guidance that provides the operator with written direction for responding to equipment malfunctions and manipulation of controls that can adversely affect the operability of the MNGP offsite power system.

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.

Question 5	
5. Performance of grid reliability evaluations as part of the maintenance risk assessments required by 10 CFR 50.65(a)(4).	
(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-	Yes. The MNGP scheduling group ensures that all maintenance activities for the plant and MNGP substation affecting grid reliability or equipment designed to mitigate loss of offsite power scenarios are assessed for their impact on risk before those activities are performed. As part of this assessment, grid reliability is considered and adjustments to the work schedule are made if appropriate (severe weather or grid instability is significant). Many routine maintenance activities associated with equipment supporting offsite power supply have been reviewed and qualitatively determined to have a relatively small risk impact and are noted as having been qualitatively assessed. In such cases the online risk model does not quantitatively assess this impact. Other maintenance activities associated with equipment supporting offsite power, such as removing a transformer, power supply line, or substation breaker from service, have been determined to be significant and are quantitatively incorporated into online risk assessment calculations. The scheduling group contacts the risk analysis group for support when a condition arises that requires a detailed assessment beyond the capability of the normal online assessment tool (EOOS, EPRI software program "Equipment Out Of Service" that is used to provide risk analysis for maintenance activities).

Question 5	
driven pump, an alternate AC power source) out-of-service?	
(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?	The TSO notifies the MNGP control room if grid stability degrades. The MNGP operations group is responsible for ensuring that risk is assessed for applicable plant conditions, including degraded grid stability. The schedule reflects that maintenance activities are being performed, and indicates corresponding risk values. If conditions change unexpectedly, risk is re-assessed with assistance from the scheduling group or the risk analysis group, as necessary.
(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? 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	Typically the grid carries more power during summer months due to heavier loading. However the stress on the grid is a function of what equipment is in service and the ability of the grid to handle the increased loading with respect to winter months. Existing procedures and protocols used by the TSO provide guidance on the grid operations to maintain grid reliability and stability. These guidelines include direction on adjustments of real and reactive power generation, load shedding, etc. to maintain a stable grid and reliable power to the MNGP. The overriding concern of the TSO is to maintain continued grid reliability/stability. To protect the grid, TSO procedures require that service to residential and commercial customers be reduced by first reducing voltage at the distribution level and if required, shedding load. The residential and commercial customers may experience electrical outages at the distribution level while the grid is unaffected. Hence, offsite power would continue to be available to MNGP. Offsite power to MNGP is provided via a substation located on site. The substation consists of four incoming 345 kV transmission lines and three 115 kV transmission lines. There are three

Question 5	
question is yes, discuss the time of year when the variations occur and their magnitude.	large coal-fired units nearby that each delivers more power (between 678 MW and 877 MW) to the grid than does MNGP. With the number of lines providing access to the grid and the number of large generating units in the vicinity, removal of a transmission line from service either within the MNGP Substation or elsewhere in the system does not result in a significant increase in grid stress near MNGP. Current industry data is inconclusive relative to the degree of seasonal variation in LOOP frequency. EPRI TR-1011759, dated December 2005, has shown that there is no statistically significant seasonal-regional variation in recorded LOOP events from 1997 to 2004. In addition, MNGP is not aware of a seasonal variation in LOOP frequency in the local transmission region.
(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?	The estimated likelihood of losing offsite power to MNGP is adjusted for certain conditions, such as degraded grid stability, severe weather, and maintenance activities that impact offsite power reliability, and this adjusted offsite power reliability information is factored into the online risk monitoring tool for quantitative risk assessments. The thresholds for implementing quantitative adjustments to the online risk assessments are well established, but some conditions may arise that need to be addressed on a case by case basis. MNGP adjusts the loss of offsite power frequency when grid stability degrades to an orange or red level, as defined by the TSO. Nominal values are used when grid stability is green or yellow. The frequency of LOOP is adjusted (quantitatively assessed in the online risk monitoring model) for tornado warnings, winds in excess of 60 mph, or icing conditions when reported by the TSO. The online risk analysis model incorporates maintenance activities that remove any of the offsite power supplies from service, remove substation components such as transformers, or isolate breakers. Passive activities such as “working in the substation area” are qualitatively assessed and generally determined to have a negligible impact on risk.

Question 5	
	MNGP makes no adjustments to the LOOP estimates as a function of time of day, day of week, or season.
(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?	Yes. MNGP has procedural guidance that requires direct notification of the TSO when work is planned on equipment such as load tap changers, generator voltage regulator, diesel generator testing and removal of transformers from service. Balance of plant activities such as half-scram testing and equipment maintenance activities internal to the plant that could result in a MNGP trip or grid instabilities are not directly coordinated with the TSO. However, these activities are evaluated against current system conditions per the written responsibilities outlined in the response to question 6(d) below. MNGP specific guidance is provided by procedure. This procedure provides MNGP operators with written guidance to evaluate and make decisions accordingly, for all in progress or planned work, based on Xcel's Grid System Condition Color Codes.
(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.	The TSO will notify MNGP in accordance with the agreement discussed in response to question 1(a) based upon grid conditions described in the response to question 1(b) above. These notifications would be provided to MNGP whether or not maintenance is on-going.
(g) Do you contact your TSO periodically for the duration of the grid-risk-sensitive maintenance activities?	No. MNGP relies on the TSO to contact control room operators when any grid instabilities are occurring or predicted. At that time MNGP assesses all on-going work and determines the most appropriate action(s) to take per MNGP procedures. MNGP does followup with the TSO to understand the expected duration for any grid condition that results in a color coded yellow

Question 5	
	or higher.
(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.	There is no formal training provided to the plant operators and maintenance personnel on the details of the formal agreement between MNGP and the TSO and/or MISO. Portions of the formal agreement which impact operations and/or maintenance have, however, been extracted from the agreement and incorporated into plant procedures. Training on this procedural material is provided as discussed below. Licensed Operator training for the protocol is contained within the response to question 1(d). Maintenance personnel are not involved or trained in the protocol.
(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).	A formal agreement for communication exists which would result in notification of grid conditions that would be considered as part of maintenance risk assessment. Therefore, this question is not applicable.
(j) If risk is not assessed (when warranted) based on continuing communication with the TSO throughout the duration of grid-risk-sensitive	Not applicable to MNGP. The TSO communicates grid conditions to the plant shift supervision and that information is incorporated into online risk assessments as described above (see answer to question 5(d)).

Question 5	
maintenance activities, explain why you believe you have effectively implemented the relevant provisions of the endorsed industry guidance associated with the maintenance rule.	
(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.	No alternative actions to be taken.

Question 6	
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).	
(a) Does the TSO coordinate	Yes. The TSO's "Transmission Work Request" (TWR) process and NMC's "Fleet Tagging

Question 6	
transmission system maintenance activities that can have an impact on the NPP operation with the NPP operator?	Switchyard Tagging Practices" control work and maintenance activities within the substations and are the processes used to communicate information regarding substation work activities in the grid area between the plants and the grid operators. In addition, there are policies and procedures that address these interface issues between the nuclear plants and the system operations department, which govern work activities in the nuclear plant substations. Plant level work instructions reference nuclear and generation policies and procedures, which provide the administrative and control requirements for all activities involving the nuclear generating plant substations. They apply to all Generation organizations performing work in or which could affect a nuclear generating plant substation. The type of work activities covered by these directives includes: • Switching of breakers, switches, relays, or communication equipment in a plant substation; • Routine relay, breaker, transformer, battery, meter and structural maintenance; and • Testing. TWR's associated with substation equipment under the jurisdiction of Delivery System Operations, is processed in accordance with the requirements of the Interface Agreement.
(b) Do you coordinate NPP maintenance activities that can have an impact on the transmission system with the TSO?	Yes, refer to response to question 5(e). MNGP informs the NSP TSO of planned maintenance through NSP's TWR process. It should be noted that this would apply to maintenance of substation transformers, breakers and other equipment in the substation that is owned and maintained by Xcel, the parent utility that also operates the transmission system.
(c) Do you consider and implement, if warranted, the rescheduling of grid-risk-sensitive maintenance	Yes. The current grid condition is posted in the MNGP Work Control Center (WCC) and Main Control Room. In addition, contingency voltages are continuously monitored, and the plant shift supervision is notified if contingency voltages are predicted to be inadequate. This information is taken into account, as applicable, prior to performing maintenance or testing on

Question 6	
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?	risk significant equipment. MNGP work instructions provide guidance on approval for work to commence. This written direction requires shift supervision to take into account the condition of the electrical grid as appropriate for the activity under consideration. If warranted, grid-risk-sensitivity activities are rescheduled.
(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.)	Yes. All grid-risk-sensitive maintenance activities are subject to a rigorous review prior to work start as outlined in various MNGP and TSO procedures and guidance documents per the interface agreement. Xcel grid (transmission/generation) system status color codes provide an indication of grid status. This code is based on the combination of: 1) system generation availability versus demand; and 2) transmission system load versus operating limits. A color code of green indicates normal system status. Yellow is a warning status. Orange is a danger status. Red is an emergency status. MNGP's PRA group has developed a computer model to determine the probability of a core damaging event based on plant configuration. The small probability of the loss of the grid system when the status changes from green to yellow has been determined to be negligible. However; the likelihood of a loss of offsite power is assessed to be significantly higher when the grid system status is changed to orange or red. If there is an overriding need to perform or continue in progress work during imminent or degraded grid conditions, then, written guidance would direct the necessary actions to be taken for the given system condition code. The system condition color code is displayed in the Work Control Center (WCC) and Main

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	Control Room. The Control Room Supervisor is responsible for ensuring the Main Control Room and WCC system condition color code indicators reflect any changes indicated by System Operations in a timely manner and also match each other.
(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.	Actions to be taken are addressed within each of the responses to questions 6(a) through 6(c) above. The procedures that govern these actions are also discussed in the same responses. Strict procedure adherence is an expectation of both NMC and Xcel management. For 6(d), the MNGP and NMC Fleet risk management procedures direct that additional risk evaluations be performed taking into account elevated grid conditions (described as yellow, orange or red) as provided by the TSO to assess the core damage frequency (CDF) associated with the proposed maintenance activity. A similar maintenance risk color identifier is assigned (per the EOOS evaluation) to the unit for equipment out-of-service configuration based on the configurations of both plant and grid to establish a specific CDF. A maintenance risk color category of red indicates that the risk rate is too high, and must be reduced immediately by placing equipment back in service or by implementing contingency or compensatory measures. The color category actions are assigned based on the length of the risk-informed allowable out-of-service time, as follows: • Red – Do not voluntarily enter these configurations. Plant Operations Review Committee must authorize operation for any length of time in this condition. Immediately restore equipment to service, or implement risk management actions to restore at least an ORANGE color category. • Orange – Plant Manager approval required to commence planned activity. • Yellow – Shift Manager approval required to commence planned activity. • Green – Normal work control procedures apply. Maintenance activities performed by Xcel on grid reliability sensitive equipment are also

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	governed by similar restrictions based on the system condition color code and are coordinated with plant maintenance or curtailed appropriately, and specific elevated grid condition operating procedures are initiated depending on the severity of the system code. By maintaining the lowest out-of-service times and the lowest CDF risk with appropriate risk informed decisions, reasonable assurance is provided that grid sensitive maintenance activities will be effectively managed.
(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).	Licensed Operators are trained on and process several TWRs which affect the MNGP substation during the initial training. Classroom training is provided on MNGP Administrative Work Instructions that specify compensatory measures to be applied under the conditions described in response to question 6(e) above. On the Job Training / Task Performance Evaluation (OJT/TPE) is then performed on-shift. MNGP maintenance personnel do not perform maintenance on substation equipment.
(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).	Not applicable. There is effective coordination between MNGP and the TSO regarding transmission system maintenance or MNGP maintenance activities. Such coordination is in accordance with procedures and communication protocols.

Question 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.	As discussed in response to questions 6(a) through 6(d), MNGP effectively implements appropriate risk management actions.
(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).	No alternative actions to be taken.

Offsite 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.

Question 7	
7. Procedures for identifying local power sources that could be made available to resupply your plant following a LOOP event. Note: Section 2, "Offsite Power," of RG 1.155 (ADAMS Accession No. ML003740034) states: Procedures should include the actions necessary to restore offsite power and use nearby power sources when offsite power is unavailable. As a minimum, the following potential causes for loss of offsite 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	
(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.	MNGP is also owned by the parent owner of the grid TSO, therefore no formal agreements exist other than the agreements identified in response to question 1(a). The Xcel Corporate System Restoration Plan states in Section 7.2 that, "The nuclear plants could receive auxiliary power as soon as the system and frequency stabilize. However, if either or both nuclear sites were to request power because of failures or problems with their emergency station generators, power would be routed to their respective substations". The plant would get top priority for restoration of offsite power if the emergency diesel generators were not operable. The priority would not be for re-starting the plant, but rather to restore power to the safe shutdown equipment. Procedures allow back feeding from the Elk River - Great River Energy 230 kV line through 7N2 to accomplish this. The nuclear plants would not necessarily be the first to have offsite power restored (providing the emergency diesel generators were functional), because it is much easier, faster, and safer, from a reactor safety perspective, to restart the fossil units first.
(b) Are your NPP operators trained and tested on	The TSO is responsible for restoration of power to the Monticello Substation in the event of a

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identifying and using local power sources to resupply your plant following a LOOP event? If so, describe how.	LOOP. Operators are trained on the station blackout (SBO) AOP, which gives direction for communication with the TSO on plant conditions and also directs actions for restoration per MNGP procedures. This is comprised of classroom training on the abnormal procedures and training in the Simulator.
(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.	MNGP is an asset owned by the same company that owns and operates the Transmission System and has established agreements to maintain adequate voltage and current support as described in response to question 1(a). The requirement for procedures to restore AC power to MNGP is met by providing instructions to the system dispatcher to give the highest possible priority for restoring offsite power to MNGP in the event of a grid collapse and a simultaneous loss of emergency diesel generators at the site. The TSO System restoration and blackout procedures also contain this guidance and identify initial power sources for restoration. The TSO is required by the North American Electric Reliability Council (NERC) standards to maintain a system restoration plan. The plan provides for priority restoration of power to nuclear units in the event of a system blackout. MNGP's SBO and LONOP AOPs provide for communication between the system operator and MNGP Operations with regard to efficient restoration of AC power from the grid. Load restoration at the plant level is also addressed within the SBO and LONOP AOPs.

Losses of offsite 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.

Question 8	
8. Maintaining SBO coping capabilities in accordance with 10 CFR 50.63.	
(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?	No. The site has not experienced a LOOP event since the implementation of the Station Blackout rule.
(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 offsite power design characteristic group?	Not applicable.
(c) If so, what were the results of this reevaluation, and did the initially determined coping duration for the NPP need to be adjusted?	Not applicable.

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(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.	Not applicable.

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	Based on the responses provided above, NMC considers that operation and maintenance of the MNGP is in compliance with the noted regulatory requirements to the extent described in the plant's licensing basis.

CFR 50.65(a)(4), 10 CFR 50.63, 10 CFR 55.59 or 10 CFR 50.120, describe the schedule for implementing it.	