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NLS2006008
March 30, 2006

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
11555 Rockville Pike
Rockville, Maryland 20852

Subject: Response to NRC Generic Letter 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," dated February 1, 2006
Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

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

The purpose of this letter is for Nebraska Public Power District (NPPD) to provide the information requested by referenced Generic Letter 2006-02. The Nuclear Regulatory Commission (NRC) requested this information to determine compliance with regulatory requirements governing electric power sources and associated training. Specifically, the NRC is requesting information regarding (1) use of protocols between the nuclear power plant (NPP) and the transmission system operator (TSO), independent system operator, or reliability coordinator/authority including the use of transmission load flow analysis tools; (2) use of NPP/TSO protocols and analysis tools by TSO's to assist NPP's in monitoring grid conditions for consideration in maintenance risk assessments; (3) offsite power restoration procedures in accordance with Section 2 of NRC Regulatory Guide (RG) 1.155, "Station Blackout"; and (4) losses of offsite power caused by grid failures at a frequency equal to or greater than once in 20 site-years in accordance with RG 1.155. The requested information is being made under the requirements of 10 CFR 50.54(f).

The Cooper Nuclear Station (CNS) response to the requested information in GL 2006-02 is contained in the attachment to this submittal. NPPD is not making any commitments as a result of this response.

By copy of this letter and its attachments, the appropriate State of Nebraska official is notified. Copies to the NRC Region IV office and the CNS Resident Inspector are also being provided in accordance with 10 CFR 50.4(b)(1).

Should you have any questions or require additional information, please contact Paul Fleming, Licensing Manager, at (402) 825-2774.

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

Executed on: MAR 30 2006
Date

Sincerely,

for RK Edington

Randall K. Edington
Vice President-Nuclear and
Chief Nuclear Officer

/em

Attachment

cc: Regional Administrator w/attachment
USNRC - Region IV

Cooper Project Manager w/attachment
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/attachment
USNRC - CNS

Nebraska Health and Human Services w/attachment
Department of Regulation and Licensure

NPG Distribution w/attachment

CNS Records w/attachment

RESPONSE TO GENERIC LETTER 2006-02, "GRID RELIABILITY AND THE IMPACT ON PLANT RISK AND THE OPERABILITY OF OFFSITE POWER"

Requested Information

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 TS.

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).

NRC Request 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 TS.

(a) Do you have a formal agreement or protocol with your TSO?

NPPD Response to Request 1(a):

YES. An Interface Operating Agreement (IOA) between Cooper Nuclear Station (CNS), acting as the Nuclear Power Plant (NPP), and other Nebraska Public Power District (NPPD) organizations acting collectively as the Transmission System Operator (TSO) is in effect. Omaha Public Power District owns one of the off-site power sources to CNS, the 69 KV line, but NPPD performs the analysis on both off-site power sources and satisfies the TSO function with CNS. NPPD TSO representatives include Doniphan Control Center (DCC) for real time operational analysis and Columbus General Office (CGO) Transmission Planning for long term off-line grid operational planning analysis. The on-line near real time contingency analysis (RTCA) tool utilized by DCC is the Siemens Spectrum Energy Management System (EMS) Security Analysis (SA). The off-line power system analysis tool utilized by CGO Transmission Planning is Power Technologies Inc. (PTI) Power System Simulator/Engineering (PSS/E). PSS/E is a package of programs for studies of power system transmission network and generation performance in both steady-state and dynamic conditions.

(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.

NPPD Response to Request 1(b):

Attachment 2 of the IOA identifies grid conditions that would trigger a notification such as RTCA violation of 4160 voltage < 95%, RTCA out of service >1 hour, Low voltage

alarms on off-site sources, and low grid frequency. Per the IOA Section 8, TSO continuously monitors CNS area grid conditions, and notifies CNS Control Room of any grid condition listed on Attachment 2 of the IOA, as soon as practical. Per the IOA, notification is, "*as soon as practical.*" There is no specific time period required for notification of a grid condition. "*Continuous monitoring*" for grid conditions is met by reviewing conditions once an hour.

(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.

NPPD Response to Request 1(c):

CNS monitors local grid and switchyard conditions using the Control Room data collection procedure and Electrical Board alarm procedures. If certain specific conditions are identified such as primary voltage indication on the incoming off-site sources (the 69 kV or 161 kV lines) below the limit, essential bus low voltage lockout alarm, or Main Generator low frequency alarm, then those procedures direct CNS Operators to enter the Degraded Grid Voltage Emergency Procedure (5.3GRID). Procedure 5.3GRID provides guidance for CNS to contact TSO for real time grid monitoring program status to assess applicable off-site AC source operability. CNS verifies with TSO that the RTCA is in service and processing grid contingencies, i.e. "solving." If RTCA is not solving, CNS uses backup methods of checking line voltage and/or voltage alarms to assess grid conditions, and TSO monitors CNS off-site power sources, the 69 KV and 161 KV lines, for low voltage alarms. For emergent work, the Schedule Risk Assessment procedure provides guidance for scheduling and performing risk evaluations which require coordination with TSO.

(d) Describe how NPP operators are trained and tested on the use of the procedures or assessing grid conditions in question 1(c).

NPPD Response to Request 1(d):

Training and testing on use of procedures, including 5.3GRID, is implemented as part of Licensed Operator (LO) training programs. Site specific task lists identify for Senior Reactor Operators (SRO's) a task to direct actions for degraded grid voltage, and for Reactor Operators (RO's) a similar task to respond to degraded grid voltage. The LO training program provides guidance on scheduling training and includes a classroom lesson for electrical abnormal procedures that includes 5.3GRID. The program also includes a simulator lesson for degraded and oscillating grid voltage that includes implementing 5.3GRID. LO Requalification training includes a lesson that includes 5.3GRID to be completed annually. CNS also trains operators annually on the TSO Instruction for Cooper Black Plant. Other examples include lesson plan scenarios for loss

and recovery of off-site power, recirculation runback, loss of grid and DG failures that require the use of 5.3GRID. The RO task to respond to degraded grid voltage is a requalification task completed on a minimum biennial basis.

(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.

NPPD Response to Request 1(e):

This question is not applicable, because CNS has a formal agreement with the TSO.

However, compliance with GDC-17 is not predicated on this agreement. Compliance with GDC-17, as supported by NUREG 0800, is based on "each [offsite power] circuit has been sized with sufficient capacity to supply all connected loads" and "results of the ... grid stability analysis indicated that loss of the largest generating capacity being supplied to the grid, loss of largest load from the grid, loss of the most critical transmission line, or loss of the unit itself will not cause grid instability." As confirmed in the Generic Letter definitions, for a given disturbance, stability equates to maintaining a state of equilibrium and not a specific voltage.

The NPPD TSO is required by the North American Electric Reliability Council, the regional reliability council, Midwest Reliability Organization, and the Mid-Continent Area Power Pool Regional Transmission Committee to perform periodic studies to ensure compliance with their grid stability criteria and planning standards. These criteria include limits on the maximum allowable voltage deviation and duration of transients for a given grid disturbance.

(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).

NPPD Response to Request 1(f):

As previously stated in response to questions 1(a) and 1(b), CNS does have a formal TSO agreement. Included are prompt notification provisions based on analysis of what post reactor trip and post accident voltage will be. Per IOA Section 8, TSO continuously monitors CNS area grid conditions, and notifies CNS Control Room of any grid condition listed on Attachment 2 of the IOA, as soon as practical. Per the IOA, notification is "as soon as practical." There is no specific time period required for notification of a grid condition.

(g) Describe the low switchyard voltage conditions that would initiate operation of plant degraded voltage protection.

NPPD Response to Request 1(g):

CNS Essential Busses (Class 1E) are normally supplied by the Normal Station Service Transformer and, therefore, experience very limited impact from grid conditions. However, if the Essential Busses are supplied by an offsite power source and the voltage on the 4160 volt busses is 3915 volts or less, the degraded voltage protection is assumed in accident analyses to initiate. 3915 volts corresponds to the upper calculated value of the reset function for the degraded voltage relays and is the calculated post-accident voltage identified in 5.3GRID that requires off-site power sources to be declared inoperable.

NRC Request 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.*

NPPD Response to Request 2(a):

YES. As noted in response to question 1(a), TSO representatives include DCC for real time operational analysis and CGO Transmission Planning for long term off-line grid operational planning analysis. The on-line RTCA tool utilized by DCC is the Siemens Spectrum EMS SA. The off-line power system analysis tool utilized by CGO Transmission Planning is PTI PSS/E. PSS/E is a package of programs for studies of power system transmission network and generation performance in both steady-state and dynamic conditions. Specifics of predictive methods and operability limits are discussed in response to 1(f) and 1(g) above.

(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?*

NPPD Response to Request 2(b):

YES. The analysis tools are described in response to questions 1(a) and 2(a). TSO uses those analysis tools, in conjunction with the IOA and the TSO's associated instructions and procedures, as the basis for determining when conditions warrant CNS 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 actuation of plant degraded voltage protection? If not, discuss how such a condition would be identified on the grid.*

NPPD Response to Request 2(c):

YES. The tools analyze a trip of CNS and subsequent Loss-of-Coolant Accident (LOCA) emergency load transfer scenarios in both real time operational analysis and long term grid operational planning studies. The resultant predicted critical interface grid voltages from the analysis tools are monitored and actions are taken by CNS if equipment operability is affected.

TSO utilizes the offline power system analysis tool to monitor the transmission system to determine when a loss of the CNS generator with a concurrent design basis LOCA loading onto one of the offsite power sources would result in reduced bus voltage on the Essential busses. The analysis tools evaluate two contingencies, one for each offsite power source, and the TSO notifies the CNS Control Room if the results indicate that the voltage on the Essential busses would be below 3952 volts (<95% Nominal). The upper end of the degraded voltage relay "reset" band is 3915 volts. See NPPD response to question 1(g).

(d) *If your TSO uses an analysis tool, how frequently does the analysis tool program update?*

NPPD Response to Request 2(d):

The RTCA updates every 5 minutes or after a topology change in the system such as system reconfiguration. The off-line power system analysis tool updates on demand.

(e) *Provide details of analysis tool-identified contingency conditions that would trigger an NPP licensee notification from the TSO.*

NPPD Response to Request 2(e):

As described previously in the response to 1(b), Attachment 2 of the IOA identifies grid conditions that would trigger a notification such as RTCA violation of 4160 voltage <95%, RTCA out of service >1 hour, low voltage alarms on off-site sources, and low grid frequency. CNS is notified by TSO if any of the conditions listed in Attachment 2 of the IOA occur.

(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?*

NPPD Response to Request 2(f):

YES. The IOA specifically requires CNS to be notified for periods of time when the RTCA is not solving. If the RTCA is not solving, CNS uses backup methods of checking line voltage and/or voltage alarms to assess grid conditions. TSO also monitors CNS off-site power sources, the 69 KV and 161 KV lines, for low voltage alarms. CNS monitors local grid and switchyard conditions using the Control Room data collection procedure and Electrical Board Alarm procedures. When certain specific conditions are identified, those procedures direct the operator to enter 5.3GRID to assess off-site AC source operability. CNS follows Technical Specifications (TS) requirements for inoperable equipment.

(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?*

NPPD Response to Request 2(g):

NO. The RTCA contingency analysis used for CNS does not normally provide a predicted voltage, but only confirms that the predicted voltage is not in an alarm state. Shutdown loadings are normally less than the loadings assumed in the predicted design basis accident (DBA) LOCA loading contingencies. Therefore, comparison of actual shutdown voltages to the predicted DBA LOCA loading operability limit voltages does not provide a bounding verification of the analysis tool. See NPPD responses to questions 1(g) and 2(c).

(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?*

NPPD Response to Request 2(h):

This question is not applicable to CNS, because TSO uses an analysis tool.

(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?

NPPD Response to Request 2(i):

This question is not applicable to CNS, because TSO uses an analysis tool.

(j) *If your TSO does not use, or you do not have access to the results of an analysis tool, or your TSO does not perform and make available to you periodic studies that determine the adequacy of 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.*

NPPD Response to Request 2(j):

This question is not applicable to CNS, because TSO uses an analysis tool. NPPD also performs an annual grid analysis.

NRC Request 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.*

NPPD Note

Generic Letter 2006-02 appears to equate meeting GDC 17 with the Operability of the offsite circuits. As stated in Regulatory Information Summary 2005-20, *Operability Determination Process*, Appendix C.1, *Relationship Between the General Design Criteria and the Technical Specifications*, "The general design criteria (GDC) and the TS's differ in that the GDC specify requirements for the design of nuclear power reactors, whereas the TS's specify requirements for the operation of nuclear reactors." Therefore, failure to meet a GDC is considered a degraded or nonconforming condition and an operability determination is required to determine if the associated equipment is operable.

(a) *If the TSO notifies the NPP operator that a trip of the NPP, or the loss of the most critical transmission line or the largest supply to the grid would result in switchyard voltages (immediate and/or long-term) below TS nominal trip setpoint value requirements (including NPP licensees using allowable value in its TSs) and would actuate plant degraded voltage protection, is the NPP offsite power system declared inoperable under the plant TSs? If not, why not?*

NPPD Response to Request 3(a):

YES, for the trip of CNS, because it is a consequence of the DBA and affects the capability of the grid. On the other hand, for the loss of the most critical transmission line or the largest supply to the grid (other than CNS), the answer is NO, because they are not a consequence of the DBA; the remaining transmission lines and generating units are part of the current capability of the off-site grid. The loss of individual transmission lines and the loss of the largest generating unit (other than CNS) are considered in periodic grid reliability studies. Procedure 5.3GRID provides guidance to declare the applicable off-site sources inoperable based on both actual and predicted electrical bus conditions. TS-required actions would then be taken as appropriate.

(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?*

NPPD Response to Request 3(b):

This question is not applicable to CNS. The double sequencing event is not a part of CNS design and licensing basis. Nevertheless, CNS reviewed and evaluated plant response and determined that onsite safety-related equipment would remain capable of performing their safety-related functions (mitigating consequences of a DBA) when subjected to a double sequencing event.

(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).*

NPPD Response to Request 3(c):

Even though it is beyond our design and licensing basis, CNS reviewed and evaluated plant response to a double sequencing event and determined that plant equipment would mitigate the consequences of a design basis Loss of Offsite Power -LOCA (LOOP-LOCA). The evaluation addressed delayed Emergency Core Cooling System (ECCS) injection due to electric power source transfer, multiple motor starts, and the possibility of check-valve failures causing water hammer.

(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.*

NPPD Response to Request 3(d):

YES. Per IOA Section 8, TSO continuously monitors CNS area grid conditions and notifies CNS Control Room of any grid condition listed on Attachment 2 of the IOA as soon as practical, which includes grid conditions other than those identified in question 3(a). TSO communicates planned actions to be taken in response to the condition. CNS would enter, as applicable, TS Limiting Conditions for Operation (LCO's) 3.8.1.A, One Offsite Circuit Inoperable (AC Sources - Operating), 3.8.1.C, Two Offsite Circuits Inoperable (AC Sources - Operating), or 3.8.2.A, One Required Offsite Circuit Inoperable (AC Sources - Shutdown).

(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 inadequate.*

NPPD Response to Request 3(e):

As described in response to questions 3(a) and 3(d), CNS would declare applicable components inoperable when degraded grid conditions exist and would enter TS action statements as required.

(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).*

NPPD Response to Request 3(f):

Required actions for degraded conditions are embodied in plant procedures and TS's. Use of Emergency Procedures, including 5.3GRID, and application of Electrical TS's is part of LO training programs. Initial LO training program includes lessons on electrical power systems and electrical abnormal procedures, including 5.3GRID, TS Sections 3.8.1 and 3.8.2. The program also includes simulator lessons on degraded and oscillating grid voltage that includes implementation of 5.3GRID. An LO Requalification lesson includes 5.3GRID and is required to be completed annually. The classroom lesson on TS's 3.8.1 and 3.8.2 may be selected to be part of the LO Requalification two-year training program. See also NPPD response to question 1(d).

NRC Request 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 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.

NPPD Response to Request 4(a):

YES. TS Bases, the Updated Safety Analysis Report (USAR), and CNS Operating Procedures describe plant controlled SSC's that could adversely affect the operability of off-site power for CNS. Appropriate precautions and limitations are specified in those procedures. Alarm and emergency procedures provide guidance for responding to degraded conditions of those SSC's.

TS Bases B.3.8.1, AC Sources Operating, and B.3.8.2, AC Sources Shutdown, contain some detail regarding what encompasses a qualified (i.e., operable) offsite circuit. They identify in part, "... offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls..." USAR Section VIII, Electrical Power Systems, provides description, safety objective, and safety design bases detailing the specifics that support the off-site AC sources. These include transmission line and tower design considerations, line separation analysis, switchgear and breaker design, transfer schemes, and undervoltage relaying and protection.

Operating procedures for Startup Transformer and Emergency Standby Station Transformer, and TS-required surveillance procedures for Off-Site AC Power Operability specify what components and alignments are required to ensure off-site power source operability. Some of those components and alignments include verification of circuit transfer capability, voltage checks, relay checks, specific offsite breaker alignment, check of supporting transformer in service, and ensuring generator reactive load (MVAR's) are within limits that support offsite circuit operability.

Training on AC distribution including off-site circuits is part of the Initial LO and LO Requalification Programs. See also NPPD 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.*

NPPD Response to Request 4(b):

This question is not applicable to CNS based on the response to 4(a).

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.

NRC Request 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-driven pump, an alternate AC power source) out-of-service?*

NPPD Response to Request 5(a):

YES. 10 CFR 50.65(a)(4) requires performance of a risk assessment prior to maintenance activities. Maintenance is defined broadly and would include surveillances, post maintenance testing, and preventive and corrective maintenance. TSO notifies CNS of upcoming outages on the grid. CNS's Schedule Risk Assessment procedure requires qualitative evaluations as guided by 3 attachments. Attachment 4 for high risk activities is a subjective evaluation to determine if maintenance has significant potential to initiate one of these events. Attachment 5 is system-specific guidance and includes on-site and off-site power sources. Attachment 7 is qualitative risk assessment guidance. The CNS Work Control Process requires considering grid condition prior to releasing work.

(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?*

NPPD Response to Request 5(b):

YES. However, NUMARC 93-01 does not define "grid-risk-sensitive maintenance," so there is no unique guidance for such activities. How NPPD determines whether grid conditions are changed, or whether these changes are significant enough to warrant re-assessment, are not prescribed in the NRC-endorsed guidance.

Nevertheless, the grid is continuously monitored, regardless of whether maintenance is being performed or not. Per the IOA, TSO continuously monitors CNS area grid conditions, and notifies CNS Control Room of any grid condition listed on Attachment 2

of the IOA as soon as practical, and communicates planned actions to be taken in response to an alarm. See also NPPD's response to question 3(d).

Initial risk is described in response to question 5(a). The Schedule Risk Assessment procedure also assigns appropriate responsibilities for the Work Week Director, for the Operations Shift Manager, and for Shift Technical Engineers to reassess risk when warranted.

(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 question is yes, discuss the time of year when the variations occur and their magnitude.*

NPPD Response to Request 5(c):

Part 1 – YES. There are seasonal load variations which impact the pre-stressed conditions associated with the CNS NPP off-site grid. The Summer Peak load season is the worst case pre-stressed condition for the off-site grid voltages in this area primarily from regional transfers through the 345 kV switchyard during the summer months combined with the higher local summer loads. The Winter Peak load season is also stressed but to a lesser degree. The Spring and Fall off-peak periods are typically less stressed periods and typically are windows when transmission maintenance on the off-site grid components are scheduled. Proposed maintenance activities which impact the off-site grid capability are extensively studied and coordinated with CNS. These off-line TSO studies incorporate seasonal load conditions, scheduled transmission outages, and regional generator outages expected during the proposed maintenance period. For potential grid operating conditions which may not meet CNS requirements, mitigation plans are developed or the requested maintenance activity may be deferred. Once the coordinated transmission maintenance plan is approved and executed, then TSO provides real time monitoring of the off-site grid conditions during the maintenance period. CNS is on the north (upstream) end of the Cooper South flowgate. Flows on the flowgate can be higher during off-peak periods. Flowgate limits have been established so there is no additional risk to off-site power. TSO notifies CNS when flows on the flowgate approach operating limits and if the operating limit is reached per the IOA.

Part 2 – NO. 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. An analysis performed by NPPD demonstrates there is not a seasonal variation for the LOOP frequency.

(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?*

NPPD Response to Request 5(d):

YES. As noted in response to question 5(c), there are no seasonal variations in LOOP probability. However, for grid maintenance, CNS considers system conditions qualitatively before approving work. CNS qualitatively assesses the stability of off-site power conditions when the start of work on Plant SSC's is authorized.

(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?*

NPPD Response to Request 5(e):

YES. CNS contacts TSO per the Schedule Risk Assessment procedure. Section 6 of the procedure lists conditions for which CNS is required to contact the TSO System Operator to determine status of grid conditions.

(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.*

NPPD Response to Request 5(f):

See response to question 1(b).

(g) *Do you contact your TSO periodically for the duration of the grid-risk-sensitive maintenance activities?*

NPPD Response to Request 5(g):

NO. The process used for CNS plant notification by the TSO removes the need for CNS to contact the TSO periodically since TSO initiates notifications when necessary. The TSO continuously monitors CNS area grid conditions, and if degraded conditions are detected, notifies CNS as soon as practical. Therefore, CNS does not have a procedural requirement to periodically check with the TSO to determine if grid conditions would require a notification to CNS by TSO. See response to question 1(b). CNS will contact the TSO under certain observed conditions.

(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.*

NPPD Response to Request 5(h):

CNS does not provide a separate, specific lesson plan on the IOA. Rather, the IOA is reflected in the plant procedures that CNS trains on as discussed in the response to question 4(a). The principle procedures reflecting the IOA are operating, scheduling and risk management procedures. The Initial LO Training program trains operators on the procedures for Schedule Risk Assessment and the Work Control Program through the SRO Upgrade Self-Study Program and the Initial LO Self-Study Program. The Maintenance personnel training program includes training on the Work Control Program through the lesson on Maintenance Work Control. Thus, Operators receive training that directly reflects the IOA. Maintenance personnel are trained on execution of work schedule, including adjusting to emergent conditions, but do not need specific training on the IOA.

(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).*

NPPD Response to Request 5(i):

This question is not applicable to CNS, because CNS does rely on the IOA and implements it through the Work Control process which requires consideration of grid status prior to releasing work orders.

(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.*

NPPD Response to Request 5(j):

This question is not applicable to CNS, because the condition would be assessed for risk as an emergent condition as required by the Schedule Risk Assessment procedure.

(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.*

NPPD Response to Request 5(k):

This question is not applicable to CNS, because no additional action is required based on previous responses.

NRC Request 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?*

NPPD Response to Request 6(a):

YES. TSO notifies CNS of upcoming scheduled regional transmission maintenance outages which could impact the operations of CNS. Per the IOA, TSO provides CNS periodic power system analysis support to evaluate and manage risks associated with transmission system maintenance activities and their impacts on CNS operations.

(b) *Do you coordinate NPP maintenance activities that can have an impact on the transmission system with the TSO?*

NPPD Response to Request 6(b):

YES. Maintenance activities that can have an impact on the transmission system are coordinated with the TSO. A maintenance activity that would impact the transmission system would require a switching clearance or load schedule change. Switching clearances are incorporated into the maintenance packages and monitored by the TSO. Load schedule changes are communicated by CNS to TSO in advance of the activity as required by the maintenance package.

(c) *Do you consider and implement, if warranted, the rescheduling of grid-risk-sensitive maintenance activities (activities that could (i) increase the likelihood of a plant trip, (ii) increase LOOP probability, or (iii) reduce LOOP or SBO coping capability) under existing, imminent, or worsening degraded grid reliability conditions?*

NPPD Response to Request 6(c):

YES. The Schedule Risk Assessment procedure provides guidance to reschedule or restore equipment based on the likelihood of a plant trip, increase in LOOP probability, or reduced LOOP or Station Blackout (SBO) coping capability under existing, imminent, or worsening degraded grid reliability.

(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.)*

NPPD Response to Request 6(d):

When degraded grid conditions are identified, the Schedule Risk Assessment procedure requires an evaluation of off-site power sources. If needed, grid-risk sensitive maintenance is performed when on-shift CNS personnel conclude the risk of the work is small compared to the safety benefit. The risk-informed Maintenance Rule allows many choices including re-scheduling. A pre-determined set of actions, including alternate equipment protection and compensatory measures, is not established. Emergent issues with the grid are managed to maintain a high level of plant safety. At times, appropriate issue management means rescheduling activities. At other times, the Shift Manager may order the on-shift staff to back-out of the task and restore the safety-related function of the equipment.

(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.*

NPPD Response to Request 6(e):

The actions are described in NPPD's responses to questions 6(a) through 6(d). The IOA governs TSO coordination of maintenance activities with CNS. The CNS Work Control procedure governs coordination of CNS maintenance activities with the TSO. The CNS Schedule Risk Assessment procedure governs scheduling and evaluation of maintenance activities for risk. The establishment of documented agreements and procedures ensures that actions will be consistently accomplished. The effectiveness of these measures is reflected in the availability of SBO-related mitigating systems. The Schedule Risk Assessment procedure provides further assurance which states, "If an off-site power source becomes inoperable, degraded, or the risk of loss is significantly increased due to plant or environmental activity during power operation, then the Diesel Generators, HPCI, RCIC, and Critical DC buses should be maintained or returned to an available status as soon as practical." This ensures that SBO-related mitigating systems will be available.

(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).*

NPPD Response to Request 6(f):

See response to question 5(h).

(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).*

NPPD Response to Request 6(g):

This question is not applicable to CNS, because there is effective coordination between CNS operators and the TSO regarding transmission system and plant maintenance activities.

(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.*

NPPD Response to Request 6(h):

This question is not applicable to CNS, because, as discussed in responses to questions 6(a) through 6(d), CNS 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).*

NPPD Response to Request 6(i):

This question is not applicable to CNS.

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.

NRC Request 7 - *Procedures for identifying local power sources[1] 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:

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

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 undervoltage 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 resupply power to your plant following a LOOP event.*

NPPD Response to Request 7(a):

CNS has agreements with the TSO as previously described that dictate priority restoration of offsite power to CNS. The TSO maintains restoration plans for the NPPD transmission system. The plans include the use of system black-start capable generation, where available. Such restoration plans consider all available transmission restoration options, including but not limited to use of other (offsite) local-area generation for re-supply of CNS. Since there is no way to predict the extent and characteristics of a specific blackout, TSO utilizes the best sources available for specific events to restore offsite power and to determine the specific power sources and paths. The TSO has many options available to restore offsite power to CNS, and would not be limited to just identified local power sources.

(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.*

NPPD Response to Request 7(b):

YES. As part of the SBO emergency procedure, CNS operators contact the TSO to implement the CNS Black Plant instruction, and per the IOA, the TSO designates CNS as a priority load. Use of emergency procedures, including SBO, is part of LO training programs and is covered by the SRO task to direct actions during a station blackout, and by the RO task to respond to a station blackout. Scheduled in the Initial LO Training program are a classroom lesson on electrical abnormal procedures that includes SBO and simulator lessons for SBO and for a tornado-induced loss of off-site power that includes the SBO emergency procedure. Requalification LO Training includes a lesson that includes SBO and is required to be completed annually. Also, CNS operator annual training on the TSO instruction for CNS Black Plant is completed. The RO task to respond to station blackout is a requalification task and is covered on a minimum biennial basis.

(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.*

NPPD Response to Request 7(c):

This question is not applicable to CNS, because the agreement is in place.

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.

NRC Request 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?*

NPPD Response to Request 8(a):

NO. However, the plant has experienced a loss of both offsite power sources caused by two separate lightning strikes as documented in Licensee Event Report 2001-004 submitted by NPPD letter NLS2001097 dated November 6, 2001. Since this loss was caused by an environmental event and was not caused by a grid failure, this question is being answered as NO. During those events, the plant did not trip and the Diesel Generators did not have to start.

(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?*

NPPD Response to Request 8(b):

This is not applicable to CNS, because the plant has not experienced the condition described in question 8(a).

(c) *If so, what were the results of this reevaluation, and did the initially determined coping duration for the NPP need to be adjusted?*

NPPD Response to Request 8(c):

This is not applicable to CNS, because the plant has not experienced the condition described in question 8(a).

(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.*

NPPD Response to Request 8(d):

This is not applicable to CNS, because the plant has not experienced the condition described in question 8(a).

Actions to ensure compliance

NRC Request 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.*

NPPD Response to Request 9:

NPPD believes that CNS is in compliance with the NRC regulatory requirements and no further actions are necessary.

Correspondence Number: NLS2006008

The following table identifies those actions committed to by Nebraska Public Power District (NPPD) in this document. Any other actions discussed in the submittal represent intended or planned actions by NPPD. They are described for information only and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITMENT NUMBER	COMMITTED DATE OR OUTAGE
None		