

ATTACHMENT 71111.01

INSPECTABLE AREA: Adverse Weather Protection

CORNERSTONE: Initiating Events
Mitigating Systems

INSPECTION BASES: Weather conditions leading to loss of offsite power (LOOP), freezing temperatures, high temperatures, and high winds dominate external risk. Adverse weather can lead to loss of multiple trains and loss of redundant equipment due to common causes.

LEVEL OF EFFORT: Annually, at the onset of seasonal extreme weather (i.e., hot, cold), conduct 1 to 3 reviews of the readiness for extreme weather conditions. Each review should include an assessment of the readiness of 2 to 4 risk significant systems.

In addition, prior to or during the onset of other occurrences of adverse weather, perform 1 to 2 reviews of the overall preparations/protection for the expected weather conditions.

71111.01-01 INSPECTION OBJECTIVE

This inspection will focus on verifying that the design features and implementation of the licensee's procedures protect mitigating systems from adverse weather effects. This procedure would be used in response to impending seasonal and/or storm-related adverse weather conditions. For the purposes of this procedure adverse weather would include events such as high winds, hurricanes, electrical storms, tornadoes, extreme high or low temperatures, conditions affecting the ultimate heat sink (debris, ice blockages, frazil ice, sea grass, fish, etc.) offsite power system and alternate AC power source.

71111.01-02 INSPECTION REQUIREMENTS

This review shall be performed for the types of weather-related risks identified for the site. The inspector should review the licensee's operating experience, corrective action program, UFSAR, etc., to determine the types of seasonal and/or storm-related adverse weather challenges to which the site is susceptible. The actual inspection for the adverse weather condition should then be performed prior to experiencing expected seasonal temperatures extremes and when expected adverse weather conditions are imminent at the site. When selecting a sample, it is recommended that the inspector consider multiple systems that are collectively risk-significant.

02.01 Evaluate Readiness for Seasonal Susceptibilities.

Perform a detailed review of the station's adverse weather procedures written for seasonal extremes (e.g., extreme high temperatures, extreme low temperatures, or hurricane season preparations). Verify that weather related equipment deficiencies identified during the previous year have been corrected prior to the onset of seasonal extremes. Evaluate implementation of the adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of and during adverse weather

conditions. Select for inspection 2 to 4 risk-significant systems that are required to be protected from the adverse weather condition.

- a. As applicable, verify, including review of UFSAR, Technical Specifications, and plant documents, that the selected systems or components will remain functional when challenged by adverse weather. Verify that plant features and procedures for operation and continued availability of the ultimate heat sink (i.e., river, lake, ocean), offsite power system and alternate AC power source during adverse weather are appropriate.) *Review the licensee's/nuclear power plant (NPP) procedures affecting these areas and the communications protocols between the transmission system operator (TSO) and the NPP to verify that the appropriate information is exchanged when issues arise that could impact the offsite power system. Examples of appropriate information to be conveyed would include: (1) coordination between the TSO and the NPP during an off-normal or emergency event affecting the NPP, (2) explanation of the event, (3) an estimate of when the offsite power system will be returned to a normal state, and (4) notification to the NPP when the offsite power system is returned to normal. [C1]*
- b. As applicable, verify cold weather protection features, such as heat tracing, space heaters, and weatherized enclosures are monitored sufficiently to ensure they support operability of the system, structure, or component (SSC) they protect. This includes instrument controller and alarm calibration programs as necessary to support the cold weather protection function. Perform necessary walkdowns to verify the physical condition of weather protection features. Additional references for cold weather are listed in Section 06.
- c. Verify that operator actions defined in the licensee's adverse weather procedure maintain readiness of essential systems. Verify that minimum/adequate operator staffing is specified. (Note: Consider accessibility of controls, indications, and equipment)
- d. If a system/component affected by the adverse weather condition is required for a reactor shutdown, verify that it would be available for performance of the reactor shutdown function under the weather conditions assumed prior to the shutdown.

02.02 Evaluate Readiness for Impending Adverse Weather Conditions.

Review the overall preparations/protection of the risk-significant systems for the weather conditions expected.

- a. Evaluate implementation of the adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of and during adverse weather conditions.
- b. Verify that operator actions defined in the licensee's adverse weather procedure maintain readiness of essential systems. Verify that minimum/adequate operator staffing is specified. (Note: Consider accessibility of controls, indications, and equipment.)
- c. The Enforcement Policy provides for the exercise of enforcement discretion under circumstances in which maintaining the stability and reliability of the electrical power supply system is consistent with protecting the public health and safety. Weather-related NOED requests usually involve a missed surveillance, an improperly scheduled surveillance, or inoperable equipment. Verify that required surveillances are current, or are scheduled and completed, if practical, before anticipated extreme weather conditions develop. Verify the licensee implements periodic equipment walkdowns, if practical, or other measures to ensure that the

condition of plant equipment is good and that potentially inoperable equipment does not prompt a NOED request.

- d. Plant modifications, new evolutions, procedure revisions, or operator workarounds implemented to address periods of adverse weather can inadvertently affect maintenance rule SSCs and should be reviewed. Determine whether these activities pose a challenge to safe plant operation. Further follow-up may be appropriate using related inspection procedures such as IP 71111.12 “Maintenance Rule Implementation,” IP 71111.15 “Operability,” IP 71111.16, “Operator Workarounds,” IP 71111.17 “Permanent Modifications,” and IP 71111.23 “Temporary Modifications.”

02.03 Identification and Resolution of Problems.

Verify whether the licensee is identifying weather related problems that could affect mitigating systems and their support systems in the licensee’s corrective action program and verify that they are properly addressed for resolution. Review the historical corrective action database to identify trends and to determine whether corrective actions have been effective. History searches of adverse weather events as well as specific weather effect mitigation equipment (e.g. heat trace circuits, intake structure traveling screens, station chillers, heat exchangers, etc.) may be useful. Review the station’s self assessments or audits for adverse weather readiness. See Inspection Procedure 71152, “Identification and Resolution of Problems,” for additional guidance.

71111.01-03 INSPECTION GUIDANCE

Cornerstone	Inspection Objective	Risk Priority	Example
Initiating Events	Inspect for adequate equipment protection to preclude weather induced initiating events.	<p>Site Specific</p> <p>For high winds, high risk exists for outdoor components, including power supplies, fuel/air lines, and sensing lines.</p> <p>For cold weather, high risk exists for components /sensing lines located in areas exposed to outside weather or located outside structures.</p> <p>Plant modifications, new evolutions, procedure revisions, or operator workarounds implemented to</p>	<p>Adequacy of protection of equipment outside structures from high winds (tornadoes and/or hurricanes) and high wind generated missiles.</p> <p>Adequacy of heat tracing and space heaters for cold weather protection of piping and equipment.</p> <p>Adequacy of physical condition of the insulation of sensitive instrument components and lines.</p> <p>Adequacy of continued availability of ultimate heat sink (protection from frazil ice or intake structure blockage due to debris including ice).</p> <p>Adequacy of safety evaluation for modification or change.</p>

		<p>address periods of adverse weather.</p> <p>For extreme weather, high risk exists due to potential grid stress and disturbances.</p>	<p>Adequacy of communication protocols between transmission operator and the NPP to verify appropriate information is conveyed when issues arise that could impact offsite power system or alternate AC power source.</p>
Mitigating Systems	<p>Inspect for the ability of the selected mitigating system or component to perform its design function under projected adverse weather.</p>	<p>Site specific</p> <p>For high winds, high risk exists for outdoor components, including power supplies, fuel/air lines, and sensing lines.</p> <p>For cold weather, high risk exists for components /sensing lines located in areas exposed to outside weather (including areas with natural air intake/ventilation) or located outside structures.</p> <p>For hot weather, high risk exists for marine fouling of various heat exchangers due to clams/mussels etc.</p> <p>For extreme weather, high risk exists due to potential grid stress and disturbances.</p>	<p>Adequacy of protection of equipment outside structures from high winds (tornadoes and/or hurricanes) and high wind generated missiles.</p> <p>Adequacy of cold weather protection of the refueling water storage tank (RWST)/condensate storage tank level, steam generator/main steamline pressure and flow, and feedwater flow sensing lines.</p> <p>Adequacy of cold weather protection for fire suppression systems, minimum flow path return lines for safety injection pumps to the RWST, cooling lines for service water pumps, or ultimate heat sink cooling water supply.</p> <p>Adequacy of site marine biofouling treatment and monitoring program. This area may be inspected when performing IP 71111.07.</p> <p>Adequacy of communication protocols between transmission operator and the NPP to verify appropriate information is conveyed when issues arise that could impact offsite power system or alternate AC power source.</p>

71111.01-04 RESOURCE ESTIMATE

The annual resource expenditure for this inspection procedure is estimated to be 15 to 21 hours at a site regardless of the number of reactor units at that site. The actual resource requirement at a site may vary, based on site specific adverse weather challenges.

71111.01-05 COMPLETION STATUS

Inspection of the minimum sample size will constitute completion of this procedure in the Reactor Program System (RPS). That minimum sample size will consist of 3 samples: 2 samples to evaluate readiness susceptibilities for seasonal extreme weather conditions per section 02.01 of this procedure, and 1 sample to evaluate readiness for impending adverse weather conditions per section 02.02 of this regardless of the number of reactor units at that site.

71111.01-06 REFERENCES

NRC Regulatory Issue Summary 2000-15, Recommendations for Ensuring Continued Safe Plant Operation and Minimizing Requests for Enforcement Discretion During Extreme Weather Conditions”

NRC Incident Response Supplement 2650-2652 “Hurricane / Severe Weather / Natural Phenomenon Event Response”

NRC IE Bulletin 79-24, “Frozen Lines”

Licensee report to NRC Regional Administrator in response to NRC IE Bulletin 79-24

IEEE 622-1979, “Recommended Practice for the Design and Installation of Electric Pipe Heating Systems for Nuclear Power Generating Plants”

Inspection Procedure 71152, “Identification and Resolution of Problems”

NRC Generic Letter 2006-02, “Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power”

Temporary Instruction (TI) 2515/165, “Operational Readiness of Offsite Power and Impact on Plant Risk”

END

ATTACHMENT 1

Revision History For 71111.01

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	03/02/07	Revision history reviewed for the last four year	None	N/A	N/A
N/A	04/03/00 CN-00-003	71111.01 has been issued to provide the minimum inspection oversight for determine the safety performance of operating nuclear power reactors.	None	N/A	N/A
N/A	01/17/02 CN-02-001	IP 71111.01 has been revised to provide detailed inspection requirements and guidance for evaluating licensee's readiness for seasonal susceptibilities and impending weather conditions. In addition, the inspection resource estimate is revised to provide a band for more inspection flexibility.	None	N/A	N/A
N/A	04/13/04 CN-04-008	IP 71111.01 has been revised to clarify sample sizes, minimum samples for completion and improve guidance provided in the inspection requirements.	None	N/A	N/A
C1 SRM M050426 -	03/23/07 CN-07-011	IP 71111.01 has been revised to address feedback form 71111.01-902 to include recommended inspection guidance and also, to incorporate inspections for the offsite power system and the alternate AC power source.	YES	Training for was performed at the Resident Inspector Counterpart Meetings and completed on 12/13/06.	ML070670471