M2000081

Northern States Power Company

Monticello Nuclear Generating Plant
2807 West County Road 75
Monticello, MN 55362

May 31, 2000

10 CFR 50
Section 50.54(a)

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

Submittal of Proposed Change to Revision 22 of the
Operational Quality Assurance Plan (OQAP)

Pursuant to 10 CFR 50 Section 50.54(a), a copy of a proposed change to Revision 22 to the Northern States Power Company Operational Quality Plan (OQAP) is submitted for NRC approval.

The proposed change has been internally reviewed and approved. It was concluded that the proposed change does reduce the commitments of NSP's Operational Quality Assurance Plan. The proposed change, the reasons for change, and the basis for concluding that that change satisfies the criteria of 10 CFR 50, Appendix B and the USAR are provided as an enclosure. This change to Revision 22 will not be implemented until approval has been obtained from NRC Region III.

Please contact Sam Shirey, Sr. Licensing Engineer – Monticello Licensing at (763) 295-1449 or John Mestad at (612) 337-2208 if you require further information.

Michael D. Wadley
President NSP Nuclear Generation

C: Regional Administrator - III, NRC
NRR Project Manager (Monticello), NRC
NRR Project Manager (Prairie Island), NRC
Sr. Resident Inspector (Monticello), NRC
Sr. Resident Inspector (Prairie Island), NRC
Minnesota Department of Commerce
J Silberg

Enclosure: Northern States Power Company, Proposed Change to the Operational Quality Assurance Plan, Rev. 22

Q004

Northern States Power Company
Proposed Change to the Operational Quality Assurance Plan, Rev. 22

Pursuant to 10 CFR Part 50, Section 50.54(a)(3), Northern States Power Company proposes the following change to the Operational Quality Assurance Plan.

Proposed Change

The proposed change would remove the listing of "Emergency lighting" from the Operational Quality Assurance Plan, Appendix B, *Prairie Island Structures, Systems, and Components Subject to Appendix B of 10CFR50.*

Reason for Change

This change clarifies the quality level for the components referred to as "Emergency lighting" in Appendix B of the Operational Quality Assurance Plan. The entry "Emergency lighting" is a nonspecific description referring to two different components: (1) the original emergency lighting consisting of a combination of incandescent lighting units and supplemental fixed battery pack lighting units, and (2) the fixed battery pack lighting units installed in compliance with 10CFR50, Appendix R, Section III.J. The safety evaluation concludes that neither of these emergency lighting components is subject to Appendix B of 10CFR50 and, as such, should be removed from Appendix B of the Operational Quality Assurance Plan.

Basis for Concluding the Change Satisfies the Criteria of 10CFR50, Appendix B and the USAR Quality Assurance Program Description Commitments:

10CFR50, Appendix B requires the identification of "components that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public." The components identified as "emergency lighting" do not belong in this category. As shown in the attached safety evaluation, *Prairie Island Safety Evaluation SE-559* (Attachment 2), the removal of the "emergency lighting" from Appendix B, *Prairie Island Structures, Systems, and Components Subject to Appendix B of 10CFR50*, of the Operation Quality Assurance Plan, does not impact any analysis or conclusions presented in the Prairie Island USAR nor does their reclassification involve an unreviewed safety question.

Affected Pages

Attachment 1 shows the affected pages of the proposed change to the Operational Quality Assurance Plan, Revision 22.

Page	Section
72	Appendix B, section 28, *Electrical Systems*

Northern States Power Company
Proposed Change to the Operational Quality Assurance Plan, Rev. 22

Prepared By: _____ Date: 5.10.2000

Reviewed By: Edie M Boyer Date: 5.11.2000

Approved By: _____ Date: 5/16/2000
Director Generation Quality Services

Approved By: _____ Date: 5/24/00
President NSP Nuclear Generation

28. ELECTRICAL SYSTEMS

Switchgear, transformers, motor control centers, load centers, batteries and chargers, and associated equipment with safety function

NOTE: Point of interface with onsite electric power systems (i.e., at point of interface with Class 1E breakers which isolate main Class 1E onsite buses from the offsite power system; and including components and circuitry interfaces that affect the proper performance of such interfacing breaker).

4,160 - 480 V switchgear from engineered safety systems (ESF), including ESF buses
4,160 - 480 V transformers (ESF load centers)
480 - 120/208 V transformers (control room and ESF area emergency lighting)
480 V switchgear (ESF load centers)
480 V motor control and motor control centers
125 V station batteries and racks (control and vital instrumentation power supplies)
125 V dc panels and switchgear (vital dc power distribution)
120 V ac instrument bus panels (vital instrumentation ac power distribution)
Containment penetration assemblies
Main control board
Radiation monitor panel
Hot shutdown panel
Control room air conditioning control panel
Post LOCA Hydrogen control panel
~~Emergency lighting~~
Emergency communications
Diesel generator and accessories
Diesel generator control panels
Relay boards and racks
Wire and cable raceway system
Underground electrical duct bank system
Cable system (power, control and instrumentation)
Instrument racks
Electrical supports
Heat tracing/freeze protection

29. INSTRUMENTATION AND CONTROL SYSTEM COMPONENTS

Reactor trip system
Engineered safety features (ESF) actuation system
Systems required for safe shutdown
Safety related instruments, tubing and fittings

Internal Correspondence Attachment 2 NSP

Date **March 15, 2000**

From **Bob Peterson** R C Peterson 3-15-00 Location **PI**

To **Ted Amundson** T. E. Amundson 3/21/00 Location **PI**
John Goldsmith J E Goldsmith 3-20-2000 **PI NGS**
Chuck Rizzo Chuck Rizzo 3-21-00 **PI NGS**
Rob Sitek Rob Sitek 3-15-00 **PI NGS**
Rod Stenroos Rodney A. Stenroos 3/21/2000 **PI NGS**

Subject **Prairie Island Q-List Committee: Approval of Q-List Change Regarding "Emergency Lighting" as justified by SE-559**

Section 6.4.1 of 5AWI 2.1.0 requires that the Q-List Committee approve the Safety Evaluation and Q-List Change for each revision of the Q-List. Please review the subject documents and signify your approval of the proposed change by signing and dating above adjacent to your name. This approval will be noted in the meeting minutes of the Q-List Committee Meeting held on March 14, 2000.

If you have any questions please call me.

Bob Peterson RCP
Q-List Committee Chairman

attachments: 1: SE-559, Rev. 0

Internal Correspondence Attachment 2 NSP

Date **March 14, 2000**

From **Sandra Johnson, Engineering** Location **PI**

To **Don Schuelke, Plant Manager** Location **PI**

Subject **Operational Quality Assurance Plan Change**

Safety Evaluation Number 559, "Emergency Lighting Quality Classification," was reviewed by the Operations Committee on 3/3/00 and approved by the General Superintendent of Engineering on 3/13/00. The Safety Evaluation justifies removing "Emergency Lighting" from the OQAP Appendix B.

Since the Plant Manager's approval is required for all changes to the OQAP, please review the attached Safety Evaluation and sign below. If you would return the documents to me, I will forward them to NQD at the General Office.

If you have any questions please call be at extension 4615.

Prepared by: Sandra Johnson

Reviewed by: R C Peterson 3/14/00

Approved: D. A. Schuelke 3-16-00

SAFETY EVALUATION (NON-DESIGN CHANGE)

Attachment 2

SE No: 559
Add: _____ Rev _____
System Code(s): EL

All Safety Evaluations for changes, tests and experiments required by 10CFR50.59 and 10CFR72.48 (except those done under the Design Change Process - 5AWI 6.1.0 series) **SHALL** be submitted using this form.

TITLE Emergency Lighting Quality Classification

1. **SUMMARY DESCRIPTION** (5AWI 3.3.3, Section 6.3.12)

During the industry's initial response to the Browns Ferry fire, fire protection and quality assurance came under scrutiny. An early NSP response was to docket the Operational Quality Assurance Plan. In response to the fire protection/quality assurance concerns, emergency lighting was placed on the OQAP Appendix B, "Prairie Island Structures, Systems, and Components Subject to Appendix B of 10CFR50." As more complete NRC guidance became available, the OQAP Appendix C for fire protection was developed. When the OQAP Appendix C, "Nuclear Plant Fire Protection Program," was developed, "emergency lighting" fell under the auspices of the fire protection program but "emergency lighting" was inadvertently left on the Appendix B list also.

This safety evaluation traces the design and regulatory history of emergency lighting at PINGP and concludes that Appendix R/fire protection lighting is the only emergency lighting system that meets current regulatory requirements. Therefore "emergency lighting" is most appropriately removed from the OQAP Appendix B list and kept under the auspices of the OQAP Appendix C for fire protection purposes.

2. **SUMMARY OF UNREVIEWED SAFETY QUESTION DETERMINATION** (5AWI 3.3.3, Section 6.3.12)

The safety evaluation does not cause a physical change to the plant nor does it change the response of the plant to any accident. The safety evaluation merely clarifies our existing design basis.

3. **TECHNICAL SPECIFICATION/LICENSE AMENDMENT OR UNREVIEWED SAFETY QUESTIONS**

YES ○ (NRC approval is required prior to implementation for conditions identified in section 6.2.2 of 5AWI 3.3.3.)

NO ◉

A. Amendment Request Transmittal DATE: _____

B. NRC Approval Received DATE: _____

C. 10CFR72 ISFSI related ☐ YES ☐ NO

SAFETY EVALUATION (NON-DESIGN CHANGE)

Attachment 2

SE No: 559
Add: _____ Rev _____
System Code(s): EL

REVIEW & APPROVAL FORM
5AWI 3.3.3

PART A REVIEWS

Check if Req'd			Assigned to:	Signature / Date	Report Attach?	# of pages
☒	1.	Design Control, PINGP 1160	NGS Dept.	Raymond E Parnas / 3/02/00	Y / (N)	
☒	2.	Design Basis, PINGP 1203	NGS Dept.	RC Peterson / 3/3/00	(Y) / N	3
☒	3.	PRA Notification	PRA Group	Ray Hauser / 2/18/00	Y / (N)	
☒	4.	System Engineer	Sys. Engr.	[illegible] / 12-22-00	Y / (N)	
☐	5.	NAD Review	NAD	/	Y / N	
☒	6.	Fire Protection Review	F.P. Engr.	[illegible] / 12-18-00	Y / (N)	
☐	7.	Environment (Seismic/EQ)	EQ Engr.	/	Y / N	
☐	8.	Regulatory Issues	RI Group	/	Y / N	
☐	9.			/	Y / N	
☐	10.			/	Y / N	
☐	11.			/	Y / N	

PART B APPROVAL

I. Engineering approval to Implement Safety Evaluation

A. Prepared By: Sandy Johnson — Date 3-3-00

B. Reviewed By: [illegible] — Date 3-3-00

II. Management approval to Implement Safety Evaluation:

A. Operations Committee Review: Date 3-8-2000 — Meeting # 2571

B. General Superintendent Engineering [illegible] — Date 3/13/00

III. SAC review completed — Date _____

IV. Copy to Training Process Manager - Nuclear (PITC) — Date _____

V. Copy to Site Licensing @ PI — Date _____

SAFETY EVALUATION (NON-DESIGN CHANGE)

Attachment 2

SE No: 559
Add: _____ Rev _____
System Code(s): EL

INDEX TO FUTURE NEEDS

YES	NO			Complete/ Submitted
☒	☐	1.	Computer File Forwarded to Design Engineering Coordinator	
☐	☐	2.	Analysis of Record Index Updated (Initial/Date)	
☐	☐	3.	Prairie Island Drawing Request (Enter #)	
☐	☐	4.	Technical Manual Request (Enter #)	
☐	☐	5.	New or Revised Specifications (Enter #)	
☐	☐	6.	Operating Procedures or Changes (Enter Log #)	
☐	☐	7.	Surveillance Procedures (Enter Log #)	
☐	☐	8.	Maintenance Procedures (Enter Log #)	
☐	☐	9.	ASME Section XI Program (ISI/IST) Changes (Enter Request #)	
☐	☐	10.	Data File Changes (Enter CFN#)	
☐	☐	11.	Request for Training Services (Enter Request #)	
☐	☐	12.	Installation or Test Procedure (Enter WO#)	
☐	☐	13.	Other Organizations (Name Below) _____ (Contacted) _____ (Contacted) _____ (Contacted)	
☒	☐	14.	OTHER Future Needs Forward to Generation Quality Services for concurrence.	
☐	☐	15.	HOLDS (identify below)	

The Operations Committee requires that items _____ be completed prior to approving implementation of this Safety Evaluation.

The above noted Future Needs have been completed and/or submitted (as applicable)

Responsible Engineer: _____ Date _____

1. PURPOSE

The purpose of this safety evaluation is to remove "emergency lighting" from the Operational Quality Assurance Plan (OQAP) Appendix B, "Prairie Island Structures, Systems, and Components Subject to Appendix B of 10CFR50," and place it under the auspices of Appendix C, "Nuclear Plant Fire Protection Program." The safety evaluation will demonstrate that the original incandescent Emergency Lighting system and the associated fixed battery pack lighting units (fulfills non-fire protection related purposes) are not subject to Appendix B or Appendix C of the OQAP. The requirements for the 10CFR50 Appendix R lighting system are not affected by this evaluation.

2. BACKGROUND

PINGP emergency lighting can be separated into two distinct categories. The original emergency lighting consists of a combination of incandescent lighting units and supplemental fixed battery pack lighting units. The incandescent system is provided with a normal and a standby power source. The lights are normally energized from an AC source. On loss of the AC source, a transfer switch powers the system from a DC source. Once AC power is restored, the transfer switch realigns the emergency lights to the AC source. The supplemental fixed battery pack lighting units are normally off and the battery is on a trickle charge from their respective lighting panel. On loss of power, the lights turn on.

The term emergency lighting also refers to the fixed battery pack lighting units installed in compliance with 10CFR50, Appendix R, Section III.J for fire protection/safe shutdown purposes. These lighting units are normally off and the battery is on a trickle charge from their respective lighting panel. On loss of power, the lights turn on.

A review of the history of PINGP emergency lighting concludes that the Appendix R lighting is the system that meets current regulatory requirements and that the "emergency lighting" listed in the OQAP Appendix B actually refers to the emergency lighting required for fire protection.

2.1. Original emergency lighting

2.1.1. Design

The 125 VDC Emergency Lighting System, as originally licensed, was a single division, non-redundant, non-safety related system with a battery backup power supply. The PS&E (Pioneer Service and Engineering) Project Design Manual [Ref. 5.1], states, "Plant lighting will be in accordance with the illumination levels recommended by the Illumination Engineering Society Standards....In special locations, such as access,

egress and vital operational areas, incandescent lighting (classed as emergency lighting system) shall be installed, fed normally from the 480-208/120 volt lighting system with electromechanical throwover switch to the batteries when normal AC power fails." The design manual system description gave no indication that the emergency lighting system required an elevated quality classification.

The PS&E design manual description is supplemented by a PS&E memo [Ref. 5.2], which states again, "The levels of illumination are in accordance with or exceed those recommended by the Illuminating Engineering Society." The memo includes design level minimum foot-candle requirements for the Turbine Building, Auxiliary Building and the Reactor Building but again, no indication that the emergency lighting system required an elevated quality classification.

2.1.2. Quality assurance classification

The original quality assurance classification for emergency lighting was non-safety related. The original emergency lighting quality assurance classification appeared in PINGP Administrative Control Directive (ACD) 2.1, Revision 0, Quality Assurance Program Boundary [Ref. 5.5]. ACD 2.1 identified the original structures, systems, components and activities to which the Quality Assurance Program applied. Section 6.0, Requirements and Recommendations, states, "The following references...identify the QA Type of items listed." The given reference is the PS&E Electrical Components List, file number 61975 [Ref. 5.6]. File 61975 lists the emergency lighting transfer switch as Design Class III and QA Type III.

PINGP ACD 2.1 defines Design Class III as "Those structures and components which are not directly related to reactor operation or containment." QA Type III is defined as items not included in Types I (safety related) and II (cause economic loss or extended shutdown). The ACD definitions concur with those in the original FSAR submittal.

The fact that the quality classification was not enhanced is further verified by the drawing NF-40383 that shows the emergency lighting panels and the transfer switch. A note on the print states "all material shown on this drawing shall comply with quality assurance type 3".

Note that since the emergency transfer switch was classified as Type III, the physical configuration of the system causes the QA I/QA III boundary to be at the respective AC and DC panel sources for the fused transfer switch. This also implies that all components downstream of the emergency lighting transfer switch are also Type III.

2.1.3. GDC 11, "Control Room"

This original emergency lighting system was cited in the FSAR [Ref. 5.23, Section 7.7] as support for meeting GDC 11, "Control Room." The applicable portion of the proposed Atomic Energy Commission 1967 GDC states, "It shall be possible to shut the reactor down and maintain it in a safe condition if access to the control room is lost due to fire or other cause."

FSAR [Ref. 5.23] Section 7.7.6, "Emergency Shutdown Control," included a list of equipment that can be used for going to hot shutdown from outside of the control room. The FSAR states that emergency lighting is provided for that list of equipment. Several of the components listed are non-safety related, such as steam dump and main feed regulating valves.

The original emergency lighting system continues to meet this GDC and still provides general emergency lighting functions. The equipment and the way the system is used have not changed in any significant manner since the design was originally installed. Reviewing plant history, a few additions to the original lighting system have occurred. The lighting additions were accomplished by the installation of fixed battery pack emergency lighting units. This safety evaluation does not change the design of the original emergency lighting system. However, the lighting requirements for fire protection purposes have changed as described in the following section.

2.2. The fire protection lighting system

2.2.1. Design

IE Bulletin 75-04 was issued in response to the cable fire at Brown's Ferry. The bulletin included a broad outline of fire protection issues that licensees were required to address. The NRC began a series of inspections to confirm compliance with 75-04 without delay. With regard to Prairie Island emergency lighting, the only request that the NRC made was for NSP to develop a periodic test of the emergency lighting transfer switch. The periodic test commitment was met by NSP per letter to the Director of Region III, dated December of 1975 [Ref. 5.3].

During the period between April of 1975 and March of 1981, while the fire protection guidelines (including Appendix R) were developing, NSP believed that the original emergency lighting was sufficient for fire protection purposes. Correspondence between NSP and the NRC continued on this issue until an NSP analysis determined that the original emergency lighting system could not meet the Appendix R criterion that a postulated fire in any area of the plant cannot cause the loss of lighting in

areas needed for access to or for operation of safe shutdown equipment [Ref. 5.4]. NSP determined in the November 1981 Appendix R review that only fixed self-contained lighting units with an 8-hour minimum battery could be credited for fire protection purposes. NSP then proceeded to purchase and install fixed battery powered lighting units to satisfy the requirements of Appendix R, Section III.J.

2.2.2. Appendix R, Section III.J, "Emergency Lighting"

For plants licensed prior to 1979, 10CFR50.48 requires that the requirements of 10CFR50, Appendix R, Sections III.G, III.J and III.O be met [Ref. 5.14]. Section III.J requires installation of eight hour battery backed emergency lighting for equipment required to be operated to achieve safe shutdown in event of a fire. PINGP has installed fixed battery pack lighting units to meet this requirement. This safety evaluation does not affect commitments made with regard to Appendix R lighting.

2.2.3. Quality assurance requirements

The quality assurance requirements for fire protection were clarified as a result of the NRC guideline, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance," [Ref. 5.7]. The NSP response to the guideline included the development of the OQAP Appendix C, Nuclear Plant Fire Protection Program [Ref. 5.22]. Among other issues, Appendix C was to provide for the quality assurance requirements for fire protection related equipment, including emergency lighting.

Currently, in the plant information computer, the Appendix R lighting is classified as "QA related for safe shutdown". QA related is defined as, "Any item, activity or service that is relied on to perform or provide information that is important to the safe and reliable operation of an operating nuclear power plant. This includes safety related, fire protection related, 10CFR71 related, critical system, and critical components of an operating nuclear power plant." [Ref. 5.15] This safety evaluation will not affect the quality assurance classification of Appendix R lighting.

2.3. Q-list

The following describes the history of the Q-list with regard to emergency lighting. Note that the entire process occurred during the period of time when NSP believed that the original emergency lighting system was sufficient for fire protection purposes.

The original Q-list was located in PINGP ACD 2.1 [Ref. 5.5]. As noted in section 2.1.2 of this safety evaluation, ACD 2.1 referred to the PS&E Electrical Components List for quality classification. The PS&E list indicated that emergency lighting was QA Type III and Design Class III.

Then in early 1976, the Special NRC Review Group completed the Browns Ferry study. One of the findings of the study was, "Many aspects of the Browns Ferry fire can be considered as lapses in QA....evidence of substantial inadequacies in the Browns Ferry QA program." [Ref. 5.17] Shortly after that, NSP received a letter stating, "...Since I&E is currently inspecting operational QA programs against the QA information contained in an FSAR, it is imperative that a description of your operational QA programs be docketed." [Ref. 5.18] Revision 0 of the NSP Operational Quality Assurance Program (OQAP) was submitted for review in June of 1976. This initial OQAP did not include the Q-list. The structures, systems, components and activities to which the Quality Assurance Program apply were located via PINGP ACD 2.1 [Ref. 5.5].

Negotiations with the NRC continued and in December of 1977, the NRC accepted Revision 2 of the NSP OQAP. [Ref. 5.19] Revision 2 of the OQAP included a Q-list (Appendix B). This revision included "emergency lighting" on the PINGP Q-list [Ref 5.8]. The submittal letter for the OQAP, Revision 2, clearly states NSP philosophy for doing this, "On the basis that the Plan can be revised, as required, through an internal review process, and to avoid preparation of a separate summary description for NRC needs, we have chosen to submit the detailed Plan for your review needs." [Ref. 5.20]

The addition of "emergency lighting" to the Q-list in Revision 2 of the OQAP was based in part on the results of PINGP Q-list meeting 77-1. PINGP Q-list meeting 77-1 is the first time emergency lighting appeared on a Q-list related document. The 77-1 meeting minutes added "emergency lighting" to the Q-list with this caveat, "The Committee reviewed and approved the System Q-listing and Notes with the following comments: a. Activities in the areas of Fire Protection...may cause classification changes in these systems at a later date..." [Ref. 5.21]

As described in section 2.1 of this safety evaluation, the original emergency lighting design is clearly non-safety related. Since the "emergency lighting" appeared on the OQAP in conjunction with fire protection issues, Browns Ferry fire protection/quality assurance concerns are considered to be the impetus behind the emergency lighting appearing on the OQAP Appendix B list.

During the same period as emergency lighting was being added to the OQAP Appendix B, another NRC guideline was issued. The NRC guideline, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative

Controls, and Quality Assurance," [Ref. 5.7] stated that, "the quality assurance aspect of fire protection should be part of the overall plant QA program. These QA criteria apply to those items within the scope of the fire protection program, such as fire protection systems, emergency lighting,...". NSP responded, "We will implement fire protection QA criteria as part of the NSP Operational Quality Assurance Program." [Ref. 5.22, Item 72] And NSP proceeded to develop the OQAP Appendix C, Nuclear Plant Fire Protection Program. When the OQAP Appendix C for fire protection was approved, "emergency lighting" should have been removed from the OQAP Appendix B list since Appendix C was then credited as providing for the fire protection quality assurance program.

3. EVALUATION

3.1. The USAR will not be affected by this safety evaluation. The safety evaluation merely clarifies the existing design. The term "emergency lighting" appears in the USAR as follows:

3.1.1. Section 1.2, Principal Design Criteria, states, "Emergency power supply for vital instruments, for control and for emergency lighting, is supplied from the 125V DC systems."

Section 1.2 describes the original emergency lighting as a load for the 125 VDC system and will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.2. Section 1.3, Summary Design Description and Safety Analysis, states "Two 125-V Station Batteries are provided for each unit to supply plant controls, d-c motors, inverters serving non-interruptible a-c buses and emergency lighting. Redundant safety controls, normal controls and nuclear instrument inverters are divided between the two batteries associated with each unit."

Section 1.3 describes the original emergency lighting as a load for the 125 VDC system and will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.3. Section 7.8.5.3, Lighting, states, "Emergency lighting is provided in all operating areas as required to support emergency shutdown outside of the control room. Detailed design of the plant lighting system is discussed in Section 10.3.6."

The original emergency lighting still provides this support function as described in Section 2.1 of this safety evaluation. This safety

evaluation does not change the original emergency lighting design basis.

3.1.4. Section 8.1, Summary (Plant Electrical Systems), states "Emergency power for some emergency lighting is supplied from the Unit 1 Train B 125 VDC system."

Section 8.1 describes the original emergency lighting system as a load on the 125 VDC system and will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.5. Section 8.5.1, 125 Volt DC System, states, "The 125 VDC Systems supply power to plant controls, inverters serving non interruptible AC Panels, and 125 VDC Systems 12 also supplies some emergency lighting."

Section 8.5.1 describes the original emergency lighting system as a load for the 125 VDC system and will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.6. Section 10, Plant Auxiliary System, states, "Plant service Systems – These systems include fire protection, ventilation, air conditioning, emergency lighting, sampling system, and compressed air."

This section uses the term "emergency lighting" generically. The distinction between the original emergency lighting system and the Appendix R emergency lighting system is made in later sections. This general statement will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.7. Section 10.3.1, Fire Protection Program, states, "Operations Manual F5, Appendix E also includes a summary of compliance with 10CFR50, Appendix R, Section III.J (Emergency Lighting)..." and "The plant is equipped with emergency communication and lighting systems that are effective and useful for the fire fighting operation."

Appendix R commitments are not affected by this safety evaluation. The OQAP Appendix C, Nuclear Plant Fire Protection Program, provides for Appendix R lighting quality assurance requirements. The Appendix R lighting will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.8. Section 10.3.6, Emergency Lighting, states, "Emergency lighting throughout the plant (excluding control room) is normally fed from the

associated Unit's 120/208-volt minimum interruptible bus with automatic transfer to one of the batteries upon failure of the AC supply,"

This item describes the power sources for the original emergency lighting system and will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.9. Section 10.3.6, Emergency Lighting, also states "Lighting units equipped with an 8-hour capacity battery for backup power are located in areas having equipment needed to safely shut down the plant and along access routes to this equipment. A description of the method of compliance with Section III.J of 10CFR50, Appendix R, is included in Operations Manual F5, Appendix E."

Appendix R commitments are not affected by this safety evaluation. The OQAP Appendix C, Nuclear Plant Fire Protection Program, provides for Appendix R lighting quality assurance requirements. The Appendix R lighting will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.10. Section 11.9.2.2, Auxiliary Feedwater System, states that in response to Generic Issue 124, "Auxiliary Feedwater System Reliability," NSP "...installed addition emergency lighting in the area of the TDAFW pumps."

This commitment was met by the installation of several fixed battery packs lighting units in conjunction with an ongoing Appendix R lighting upgrade in the Auxiliary Feedwater Pump area. The OQAP Appendix C, Nuclear Plant Fire Protection Program, provides for Appendix R lighting quality assurance requirements. The Appendix R lighting will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.11. Section 8.4.4, Station Blackout (SBO)

"Emergency lighting" does not specifically appear in this section of the USAR. SBO is considered in this safety evaluation for completeness only.

Procedure ECA-0.0, "Loss of All Safeguards AC Power," implements the PINGP response to a LOOP. The adequacy of the emergency lighting for this procedure was verified during a 1988 NRC special safety inspection [Ref. 5.11] in conjunction with modification 89Y945, "Enhanced Emergency Lighting" [Ref. 5.12]. Part of the inspection included a walkdown of procedure ECA-0.0. The applicable inspection criteria

states [Ref. 5.11], "During the walkdown, the inspectors specifically looked at component accessibility , ...emergency lighting,..." The inspectors did identify deficiencies in area emergency lighting. PINGP committed to evaluate these areas and addressed the issue using modification 89Y945. 89Y945 installed supplemental fixed battery pack lighting units to "increase reliability, operator reaction and reduce the possibility of error" [Ref. 5.12].

PINGP also meets the SBO Rule of 10CFR50.63. As described in the USAR, a Station Blackout exists when there is a Loss of Offsite Power (LOOP) and concurrent loss of both of a unit's Emergency Diesel Generator sources. PINGP compliance with the SBO rule is documented in "SBO/ESU Design Report" [Ref. 5.9]. SBO event compliance did not require an emergency lighting coping assessment since alternate AC is available within 10 minutes [Ref. 5.10]. However, plant walkdowns were performed to evaluate the ability to perform manual operations during SBO conditions. For the operation of components where emergency lighting may be insufficient, it has been determined that sufficient portable lighting is available to the operators to perform the required tasks. [Ref. 5.13]. Note that Regulatory Guide 1.115, "Station Blackout," allows the use of non-safety related systems and equipment to cope with a station blackout [Ref. 5.16]. The USAR will not be affected by the action in this safety evaluation.

Since "emergency lighting" does not appear in this section, a USAR change is not needed. In addition, the plant response to an SBO event will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.12. Section 14.4.11, Loss of all AC Power to Station Auxiliaries (LOOP)

"Emergency lighting" does not specifically appear in this section of the USAR. LOOP is considered in this safety evaluation for completeness only.

If the LOOP occurs due to a fire in the control room, F5, Appendix B, "Control Room Evacuation (Fire)," is the controlling procedure. The procedure relies on Appendix R lighting only. There is no single procedure for a LOOP event for any reason other than fire protection purposes. For the non fire protection related LOOP event, safeguards actuations are assumed to occur without outplant operator action so emergency lighting is not an issue. The LOOP scenario is, however, encompassed by the Station Blackout scenario described in Section 3.1.11 of this safety evaluation.

Since "emergency lighting" does not appear in this section, a USAR change is not needed. In addition, the plant response to a LOOP event will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.1.13. F5 Appendix E, Fire Protection Safe Shutdown Analysis Summary, states in part, "Appendix R Section III.J requires installation of eight hour battery backed emergency lighting for equipment required to be operated to achieve safe shutdown in the event of a fire. At Prairie Island, emergency lighting consisting of 8 hour battery operated lamps is installed at locations required to illuminate access paths and equipment required to be operated in order to achieve and maintain hot shutdown in the event of a fire."

Appendix R commitments are not affected by this safety evaluation. The OQAP Appendix C, Nuclear Plant Fire Protection Program provides for Appendix R lighting quality assurance requirements. The Appendix R lighting will not be affected by eliminating "emergency lighting" from the OQAP Appendix B.

3.2. Technical Specifications will not be affected by this safety evaluation. Emergency lighting appears once in Technical Specifications:

T.S. 4.6.a.3.b.3 states "During this test (Integrated SI) operation of the emergency lighting system shall be ascertained."

This requirement for testing the emergency lighting transfer switch was prompted by a NRC fire protection audit in November of 1975 as described in Section 2.2.1 of this safety evaluation. However, in March of 1981 an NSP evaluation concluded that the original emergency lighting system did not meet the Appendix R/fire protection criteria. NSP then proceeded to purchase and install battery powered lighting units to satisfy the requirements of Appendix R, Section III.J. The Technical Specification for testing the transfer switch remained.

Since the fire protection program depends on a separate lighting system, the test of the transfer switch no longer fulfills the intent of the original commitment. FOI –A0912, "Assess Need for Original 125 Vdc Emergency Lighting System" has an action item to address the Technical Specifications surveillance.

PINGP currently fulfills this Technical Specification and will continue to meet it until the issue is resolved. Technical Specifications will not be affected by the action of this safety evaluation.

The intent of the Technical Specification surveillance was to test fire protection related lighting. This intent is currently being met by the performance of SP-1785, "Safe Shutdown Emergency Lighting Monthly Test." Operations Manual, Section F5, Appendix K, "Fire Detection and Protection Systems," is not affected by this safety evaluation.

3.3. Improved Technical Specifications

Although Prairie Island is not currently operating under the Improved Technical Specifications (ITS), the emergency lighting surveillance requirement has been addressed by the ITS conversion team. Since ITS does not contain a similar surveillance requirement the transfer switch testing will not appear in ITS. It is anticipated that, under the guidelines for performing the ITS conversion, that the transfer switch testing will be moved to the Technical Requirements Manual.

3.4. Standard Review Plan (NUREG 0800).

Although PINGP is not committed to the Standard Review Plan (SRP), Section 9.5.3 of the SRP supports PINGP's understanding of emergency lighting design criteria.

Standard Review Plan (NUREG 0800), Section 9.5.3, Lighting Systems, acceptance criteria states, "Acceptability of the design of the normal and emergency lighting systems...is based in part on the degree of similarity of the systems design with those for previously reviewed plants with satisfactory operating experience. There are no general design criteria or regulatory guides that directly apply to the safety-related performance requirements for the lighting system." Later in Section 9.5.3 it is stated, "the emergency lighting system(s) is acceptable if the integrated design of the system(s) will provide adequate emergency station lighting is all areas, from onsite power sources, required for fire fighting, control and maintenance of safety related equipment, and the access routes to and from these area." This acceptance criteria compares favorably with the PS&E emergency lighting description, "In special locations, such as access, egress and vital operational areas, incandescent lighting (classed as emergency lighting system) shall be installed..."

The Standard Review Plan Section 9.5.3 recognizes the need for non-Appendix R emergency lighting system. However, it clearly states that this lighting is not intended to meet OQAP Appendix B standards. The original emergency lighting system is consistent with the intent of the Standard Review Plan criteria for section 9.5.3.

3.5. Regulatory Guide 1.160, "Effectiveness of Maintenance at Nuclear Power Plants"

The NRC determined that effective maintenance is important to safety as it relates to minimizing the challenges to safety systems, and ensuring that design assumptions and margins in the original design basis are maintained. Regulatory Guide 1.160 was developed to help prioritize and monitor plant maintenance activities. The scope of the monitoring program was to include non-safety related equipment that met the maintenance rule criteria. Application of the Maintenance Rule criteria at PINGP for lighting resulted in only the safe shutdown lighting being considered in-scope.

The safe shutdown (Appendix R) lighting is not affected by this safety evaluation. Therefore, PINGP compliance with the Maintenance Rule does not change either.

3.6. Evaluation Summary

3.6.1. Removing emergency lighting from Appendix B of the OQAP does not affect the USAR:

When the term emergency lighting is used for the original emergency lighting system, it appears as a physical description. This safety evaluation does not change the physical plant.

Appendix R requirements for the fire protection related fixed battery backed emergency lighting is specified in the USAR. When the term emergency lighting is used for Appendix R lighting, the description is clearly referring to Appendix R lighting. This safety evaluation will not change our commitments to Appendix R.

The original non-safety related incandescent emergency lighting system was licensed as providing support for meeting GDC 11, "Control Room." The system has not changed in any significant manner and continues to meet this GDC. This safety evaluation does not change the design of the original system.

The emergency lighting in regard to a LOOP or an SBO event has been verified as adequate. There is original design documentation and current industry guidance supporting the use of non-safety related emergency lighting for general lighting needs.

3.6.2. Removing the emergency lighting from Appendix B of the OQAP does not affect Technical Specifications. Although the surveillance requirement for the emergency lighting transfer switch no longer meets a fire protection related need, PINGP will continue to meet this surveillance until the issue is formally resolved.

4. UNREVIEWED SAFETY QUESTION DETERMINATION

4.1. **May the proposed activity increase the consequences of an accident previously evaluated in the SAR or in a pending SAR submittal?**

No. Consequences are measured in terms of off site dose and dose to the Control Room operator. This safety evaluation does not cause a physical change to the plant. It only establishes that "emergency lighting" as listed in the OQAP Appendix B refers to the emergency lighting units that satisfy 10CFR50 Appendix R.III.J and is more correctly placed under the auspices of the OQAP Appendix C. Therefore, this activity will not increase the consequences of an accident previously evaluated in the USAR.

4.2. **May the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR or in a pending SAR submittal?**

No. This safety evaluation does not cause a physical change to the plant but merely clarifies our existing design basis. Therefore, this activity will not increase the probability of occurrence of an accident previously evaluated in the USAR.

4.3. **May the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR or in a pending SAR submittal?**

No. The safety evaluation clarifies our existing design basis. The design requirements for the original emergency lighting system and the Appendix R lighting system remain the same. Therefore, this activity does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the USAR.

4.4. **May the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR or in a pending SAR submittal?**

No. Consequences are measured in terms of off site dose and dose to the Control Room operator. This safety evaluation does not cause a physical change to the plant. It only establishes that "emergency lighting" as listed in the OQAP Appendix B refers to the emergency lighting units that satisfy 10CFR50 Appendix R.III.J and is more correctly placed under the auspices of the OQAP Appendix C. Therefore, this activity will not increase the consequences of a malfunction of equipment important to safety previously evaluated in the USAR.

4.5. **May the proposed activity create the possibility of an accident of a different type than previously evaluated in the SAR or in a pending SAR submittal?**

No. The requirements of the original emergency lighting and the Appendix R lighting systems are not changed by this safety evaluation. The OQAP Appendix B list is being changed to more accurately reflect our commitment for emergency lighting. Therefore, this activity will not create the possibility of an accident of a different type than previously evaluated in the USAR.

4.6. **May the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR or in a pending SAR submittal?**

No. This administrative change does not adversely effect any equipment important to safety. The assumptions regarding component performance are consistent with their design bases. This change has no affect on equipment capability, configuration or operation. Therefore, this activity will not create the possibility of a different type of malfunction of equipment important to safety than previously evaluated in the USAR.

4.7. **Does the proposed activity reduce the margin of safety as defined in the basis for any Technical Specification?**

No. The Technical Specification basis does not mention the background of the emergency lighting transfer switch surveillance. This safety evaluation does not change Technical Specifications. The design requirements for the original emergency lighting system and the Appendix R lighting system remain the same. Therefore, this activity will not reduce the margin of safety as defined in the basis for any Technical Specification.

5. References

5.1. Pioneer Services & Engineering, Project Design Manual, Section 4, Account 321.266, Sheet 1, dated 7/11/67.

5.2. Pioneer Services & Engineering Memo, "System Description – Plant Lighting System, " dated 12/9/70 [7296-1494].

5.3. Letter to Director, Region III, from NSP, dated 12/30/75 [PI-0425-0117].

5.4. Letter to Director of Nuclear Reactor Regulation from L.O. Mayer, NSP, "Request for Relief...Emergency Lighting Modification," dated 11/16/81.

5.5. PINGP Administrative Control Directive 2.1, "Quality Assurance Program Boundary," dated 8/6/73 [PI-0252-0192].

5.6. PS&E, file 61975, "Plant Electrical Components List," dated 2/24/75 [microfilm roll 7204].

5.7. Letter to L.O. Mayer, NSP, from NRC, regarding, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance," dated 2/6/78. (Original memo sent 8/12/77)

5.8. Letter to Paul Hellen, NSP PINGP, from J. B. Mestad, NSP Quality Services, dated 5/22/96.

5.9. "Design Report for the Station Blackout/Electrical Safeguards Upgrade Project," dated 11/27/90.

5.10. "Station Blackout Rule Compliance Report," Appendix A, dated 5/23/89.

5.11. Letter to NSP from Region III NRC dated 7/12/88 [PI-1664-2026].

5.12. Modification 89Y945, "Safety Evaluation Enhanced Emergency Lighting," dated 8/6/90 [PI-2234-2160].

5.13. DBD TOP-15, "Station Blackout," Revision 2, Section 4.2.4.C.

5.14. DBD TOP-6, "Fire Protection/Appendix R," Revision 3, Section 1.2.2.

5.15. H1, "Quality List Classification Criteria," Revision 5.

5.16. Regulatory Guide 1.155, Station Blackout, August 1988

5.17. NSP internal memo, "Browns Ferry Fire," NRC News Release, memo dated 3/8/76.

5.18. Letter to NSP from NRC, dated 3/2/76 [10501-1638].

5.19. Letter to NRC from NSP, dated 3/8/78 [15748-0650].

5.20. Letter to NRC from NSP, "Submission of NSP Operational Quality Assurance Plan, Rev. 2," dated 11/22/77 [10502-4685].

5.21. Q-list Committee Meeting 77-1, dated 1/25/77.

5.22. Letter to NRC from NSP, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance," dated 5/18/78.

5.23. FSAR, Amendment 12, dated 11/15/71.

Attachment 2

FILE: 90XCM2 - A402 - DC
COPIES TO: SE package
R. Peterson

DESIGN BASES CONFORMANCE AND IMPACT REVIEW

Part I of this form is used for the assessment of items for conformance to PINGP's known design bases.

Part II is used to assess the impact on applicable DBDs and DBD Change Notices.

Review Item Title: SE-559, Emergency Lighting

The following indicates key words used to search for design bases requirements and the resulting documents reviewed to answer questions 1 through 10, below:

Key Words: emergency lighting

Applicable Design Basis Documents (List DBD and Rev) and Change Notices: None. The original 125 VDC emergency Lighting system is not described in any DBD. The Appendix R battery pack lighing system is described extensively in the Fire Protection/Appendix R DBD.

PART I:

	Y/N/NA	If any answers are No, explain: (use additional pages as necessary)
1)	NA	Are relevant codes and/or industry standards which PINGP is committed to, as stated in the DBD(s) Section 2.0, and DBD Change Notices addressed? (Item 1.d in DIAC, PINGP 1213, Rev 0)
2)	NA	Are bulletins, circulars, NUREGs, or Operating Experience Assessment Reports listed in the DBD(s) Section 2.0, and DBD Change Notices adequately addressed? (Item 1.e in DIAC, PINGP 1213, Rev 0)
3)	NA	Is the item consistent with the SAR, ISFSI SAR, NRC commitments, regulatory requirements or other regulatory correspondence referred to in the DBD(s) Section 2.0, and DBD Change Notices? (Items 1.f, 1.g, 1.o, and 1.n in DIAC, PINGP 1213, Rev 0)

DESIGN BASES CONFORMANCE AND IMPACT REVIEW

4) NA Are design specifications or field standards referred to in the DBD(s) and DBD Change Notices adequately addressed? (Item 1.c in DIAC, Form 1213, PINGP 1213, Rev 0)

5) NA Is consideration given to the ability of the system/structure/component to perform its functional requirements in any mode, such as startup, power operation, shutdown, refueling, special test, abnormal and emergency operation? (Item 8.c and 10.a in DIAC, PINGP 1213, Rev 0)

6) NA Are the functional and performance requirements, as stated in the DBD(s) and DBD Change Notices for the system, structure, or component adequately addressed? (Refer to the associated sections of the applicable DBD(s) for both **system** and **component**.) (Item 1.h in DIAC, PINGP 1213, Rev 0)

7) NA Has the capability of supporting systems to meet their design bases requirements been taken into adequate consideration? (e.g., heat load addition, heat tracing, floor drain capacity, etc.)
(Item 2, 3, 4, 4.h, 8.e, and 11.a in DIAC, PINGP 1213, Rev 0)

ır questions 8 through 10, list the applicable documents reviewed.

8) NA Is this item consistent with all similar modifications?

9) NA Is this item consistent with all previous non-modification safety evaluations?

None identified as applicable. Reviewed SEs 506,491,483, and 415 which all addressed App R emergency lighting

10) Y Is this item consistent with all related FOIs? (Review closure memo where appropriate.)

Consistent with A0912. Also reviewed 911, 674, 673 (all App R ltg), 839 (SFP ltg) and 748 (SBO ltg).

11) Y Is this item consistent with the SAR and/or ISFSI SAR, or pending submittals thereto?

Consistent with USAR sections as addressed in detaill is SE section 3.1 This SE also revsises OQAP Appendices Band C which is part of USAR>

12) N Is this item consistent with the PINGP Site Engineering Manual?

Addressed in EM 2.3.14 which should be clarified per the contents of this SE. EM 2.4.7 addressess App R lighting.

DESIGN BASES CONFORMANCE AND IMPACT REVIEW

13) Y Is this item consistent with Operations Manual F5 and appendices for FP/App R issues? (per GL 86-10, Item F guidance)

F sections address App R lighting and not the 125VDC emergency lighting.

14) Y Is this item consistent with all known design bases for PINGP?

Excpt as noted above, consistent with other known bases.

PART II:

This item affects a DBD? ☒ YES ☐ NO

Applicable DBD(s)?

125 VDC Auxiliaries (DC) DBD, SYS-20.9

What is the impact, if any, on the applicable DBD(s)?

Design Standards will make any necessary changes to the DBD as indicated below and/or will issue DBD Change Notices, as required, for the interim period.

Sandy Johnson added a future need to the SE to add information on the 125 VDC Emergency Lighting System to the DC DBD, which does presently inlcude this system. Therefore, a copy of this assessment will go to the A402-DC file for record.

DBD Change Notices will be issued due to this item. ☐ YES ☒ NO

Review Engineer R C Peterson Date: 3-3-00