Direct Testimony and Schedule
Samuel P. Hobbs

Before the Minnesota Public Utilities Commission
State of Minnesota

In the Matter of the Application of Northern States Power Company d/b/a Xcel Energy
for a Certificate of Need for Additional Dry Cask Storage at the
Prairie Island Nuclear Generating Plant Independent Spent Fuel Storage Installation

Docket No. E002/CN-24-68
Exhibit___(SPH-1)

Radiological Impacts

February 10, 2025

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Schedule

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND TITLE.

A. My name is Samuel P. Hobbs. I am a Health Physicist for the Prairie Island Nuclear Generating Plant (Prairie Island Plant or Plant) owned by Northern States Power Company d/b/a Xcel Energy (Xcel Energy or the Company).

Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS AND EXPERIENCE.

A. I have worked for Xcel Energy since 2008, initially as a Radiation Protection Specialist. I then served as As Low As Reasonably Achievable (ALARA) Coordinator from 2008 to 2011, and then as a Health Physicist from 2011 to present. My statement of qualifications is provided as Exhibit___(SPH-1), Schedule 1.

Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES?

A. In my current role, I am responsible for managing radiological programs including the site Groundwater Protection Program, site dosimetry program, site Radiological Environmental Monitoring Program, and the radioactive source accountability program. I am also involved in maintaining site radiological instruments.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS PROCEEDING?

A. The purpose of my Direct Testimony in this proceeding is to discuss the radiological impacts associated with the proposed expansion of the Independent Spent Fuel Storage Installation (ISFSI) at the Prairie Island Plant. My testimony also introduces the Dose Analysis performed by Sargent & Lundy, L.L.C. (Sargent & Lundy) in support of the Certificate of Need

Application (Application) in this docket. The Dose Analysis was submitted as Appendix B to the Application and was prepared by Sargent & Lundy. I also introduce the Updated Risk Assessment, which was also prepared by Sargent & Lundy, and is included as Appendix G to the Application.

Q. WHICH SECTIONS OF THE APPLICATION ARE YOU SPONSORING?

A. I am sponsoring the following sections of the Application:

- 12.1 – Radioactive Wastes
- 12.2 – Human Exposure to Radiation Due to Operation
- 12.7 – Heat Rejection
- 13.1 – Management of Radioactive Materials
- 13.2 – Contingency Plans for Accidental Release
- 13.6 – Spill and Leak Prevention
- 13.9 – Environmental Monitoring
- Appendices B-D and G

Q. WHAT SCHEDULES ARE YOU SPONSORING IN YOUR DIRECT TESTIMONY?

A. I am sponsoring the following schedule:

- Schedule 1 – Statement of Qualifications

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. My testimony is organized as follows:

- *Section II*: I discuss radiological wastes from the proposed ISFSI expansion.
- *Section III*: I address the potential for human exposure to radiation from

the proposed ISFSI expansion and the methods used to limit such potential exposure.

- *Section IV*: Conclusion

II. RADIOACTIVE WASTES AND EMISSIONS

Q. WILL THE ISFSI EXPANSION LEAD TO THE GENERATION OF RADIOACTIVE WASTES?

A. No. As discussed in the Application, the facility will store spent fuel in stainless steel canisters that are sealed closed by multiple weld layers before the canister leaves the auxiliary building to ensure that no radioactive materials can escape. The canisters are also helium leak-tested to a leak-tight criteria per ANSI N14.5. Further, the outer surface of the canister is decontaminated in compliance with the Plant's Nuclear Regulatory Commission (NRC) license prior to leaving the reactor building to ensure that residual radioactive contamination is not released to the environment.

Q. WHAT IS THE RISK OF A LEAK FROM THE STORAGE CANISTERS THAT WOULD BE STORED IN THE ISFSI?

A. The canisters stored in the ISFSI will be licensed by the NRC. Analyses of normal, off-normal, and accident conditions in spent fuel storage system Safety Analysis Reports have determined that no credible conditions can breach the canister shell or fail the double seal welds at the canister closure.

Q. HAS THE NRC CONDUCTED AN ANALYSIS OF THE LIKELY CONSEQUENCES OF AN ACCIDENTAL RELEASE FROM AN ISFSI?

A. Yes. A generic analysis of potential on-site and off-site consequences of accidental releases associated with the operation of an ISFSI is contained in NUREG-1140, "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees."

Q. WHAT DID THAT ANALYSIS SHOW?

A. The NUREG-1140 analysis concluded that the postulated accident involving an ISFSI has insignificant consequences to the public health and safety. The maximum dose to a member of the public off site due to an accidental release of radioactive materials under this scenario was calculated to be .003 roentgen equivalent man (rem) at 100 meters. The calculated dose is within the 1 rem effective dose equivalent EPA Protective Action Guideline and the 10 CFR 72.106 limit of 5 rem to the whole body or 50 rem to the maximally exposed organ from any design basis accident.

Q. ARE THERE ANY CONTINGENCY PLANS IN PLACE AT THE PRAIRIE ISLAND PLANT IN THE CASE OF A RELEASE?

A. Yes. Under NRC requirements, an emergency plan is required for the Prairie Island spent fuel storage facility. The NRC-required emergency plan already in effect for the Prairie Island Plant is applied to the ISFSI. This plan describes the organization, assessment actions, activation of the emergency organization, notification procedures, emergency facilities, training, provisions for maintaining emergency preparedness, and recovery criteria for off-normal and accident conditions. The procedures associated with this plan have been filed in this docket.

Q. WHAT DO YOU CONCLUDE ABOUT THE RISK OF EXPOSURE FROM A RELEASE OF RADIOACTIVE MATERIAL FROM THE ISFSI?

A. For the reasons discussed above, the risk associated with a release is very low. First, the cask system that will be used is unlikely to fail. Second, the risks to public health and safety posed by a release have been shown to be insignificant. Third, in the highly unlikely event of a release from the ISFSI, there is an emergency plan in place for the Prairie Island Plant that includes measures designed to address this situation.

III. EXPOSURE TO RADIATION

Q. WILL FACILITY PERSONNEL WORKING AT THE ISFSI RECEIVE INCREASED RADIATION EXPOSURE AS A RESULT OF THE EXPANSION?

A. Because there will be more spent fuel stored at the ISFSI, there would be an increase in dose rates and collective doses to Plant personnel working near the ISFSI. The Company will adhere to NRC requirements regarding personnel exposure to radiation, ensuring that each worker's annual exposure is below the regulatory limit of 0.05 Sv [5 rem]. As with the initial ISFSI, there will be some exposure during spent fuel handling, canister loading, closure welding, spent fuel drying, onsite transport operations, and placement and storage of the canisters.

Q. WHAT DOES THE COMPANY DO TO MINIMIZE DOSES TO ITS WORKERS?

A. Workers are provided with dosimetry devices to measure and record radiation dose exposure. The NRC requires a radiation protection program for the ISFSI. The Company meets this requirement by applying the extensive NRC-required program in place for the Prairie Island Plant to the ISFSI.

Q. CAN YOU PROVIDE SOME MORE INFORMATION ON THE RADIATION PROTECTION PROGRAM?

A. The primary goal of the radiation protection program is to minimize exposure to radiation such that the total individual and collective exposure to personnel in all phases of operation and maintenance is kept As Low As Reasonably Achievable. The ALARA program has three basic objectives:

1. Protection of personnel, including surveillance and control over internal and external radiation exposure, and ensuring that such exposure remains within permissible limits and ALARA;
2. Protection of the public, meaning that all activities related to shipment and storage of spent fuel are controlled by a monitoring plan, which I describe below, to ensure off-site doses are ALARA; and
3. Protection of the facility, including monitoring for physical changes that could lead to exposure hazards, and determining what changes or improvements are needed to maintain exposure ALARA.

The radiation protection staff at the Prairie Island Plant is responsible for, and has the necessary authority to, maintain occupational exposures as far below the specified limits as is reasonably achievable. The staff conducts periodic formal reviews of the radiation protection program to determine whether there are any additional reasonably achievable means to lower exposure, and modifications are made as appropriate. The program ensures that ISFSI personnel receive appropriate training, that safe operational procedures are enforced, and that adequate equipment and supplies for radiation protection work are provided.

Q. WHAT SORT OF RADIATION MONITORING IS IN PLACE AT THE ISFSI?

A. Federal Regulations require radiological alarm systems in accessible work areas, but the NRC has determined that storage confinement systems of acceptable design and construction that are sealed by welding do not require closure monitoring.

That said, there will be adequate radiological monitoring during canister handling activities through the use of portable survey instruments. Additionally, there are thermo-luminescent dosimeters (TLDs) mounted on the ISFSI security fence as well as on the nearest Owner Controlled Area boundary fence to monitor cumulative direct radiation levels over a set time period as part of the environmental monitoring program. Additional TLDs will be added in the event the ISFSI is expanded.

Q. DOES THE STATE OF MINNESOTA CONDUCT ANY RADIATION MONITORING OF THE PLANT AND THE ISFSI?

A. Yes. The Minnesota Department of Health (MDH) monitors the Prairie Island ISFSI with two Geiger-Mueller tube-based dose rate monitors (DRM). The DRMs continuously measure and report levels of gamma radiation within the ISFSI. The MDH also monitors air and surface water and conducts milk sampling. Ambient radiation dose levels are monitored using optically stimulated luminescence dosimeters.

Q. DID THE COMPANY ANALYZE THE RADIATION EXPOSURE IMPACTS THAT WOULD BE EXPERIENCED BY PEOPLE WHO DO NOT WORK ON SITE, BUT LIVE OR WORK NEAR THE ISFSI IN THE EVENT THE ISFSI IS EXPANDED?

A. Yes. The Company engaged Sargent & Lundy, an engineering firm, to prepare a Dose Analysis and an Updated Risk Assessment. Sargent & Lundy's Dose Analysis was filed as Appendix B to the Application and the Updated Risk Assessment was filed as Appendix G.

Q. WHAT WAS THE PURPOSE OF THE COMPANY RETAINING SARGENT & LUNDY TO PREPARE A DOSE ANALYSIS AND UPDATED RISK ASSESSMENT?

A. The purpose of the engagement was to obtain a conservative, bounding analysis of the radiological effect the proposed expansion would have on people who do not work on site, but live near the ISFSI. At the time the Dose Analysis was prepared, the Company was considering a potential change in dry fuel storage (DFS) system technology for use at the Prairie Island Plant. The Dose Analysis included conservative, bounding assumptions and was designed to estimate the radiological impact of the additional 44 new technology DFS systems (along with the 55 TN-40/TN-40HT casks that would already be in place) at the nearest site boundary and nearest resident. The theoretical, conservative radiological impact to station personnel and the offsite population was also calculated.

Q. WHAT DID THE DOSE ANALYSIS CONCLUDE WITH RESPECT TO THE EFFECT THE EXPANSION WOULD HAVE ON RADIATION EXPOSURE EXPERIENCED BY PEOPLE WHO DO NOT WORK ON SITE, BUT LIVE NEAR THE ISFSI?

A. As concluded in the Dose Analysis, the calculated dose values at the nearest site boundary and at the nearest resident meet regulatory acceptance criteria. Annual dose values (nearest resident) are found in Tables 6-1 and 6-2 of the Dose Analysis, and the dose rate at the site boundary is found in Table 6-3 of the Dose Analysis.

Q. WHAT WAS THE PURPOSE OF THE UPDATED RISK ASSESSMENT?

A. An initial risk assessment was prepared in 2007. This initial risk assessment was filed as Appendix F to the Application. Sargent & Lundy prepared the Update Risk Assessment in January, 2024. The Updated Risk Assessment was filed as Appendix G. Both the update and initial risk assessment were prepared to provide pertinent information on populations at risk, exposure patterns, radiation doses, and types of health effects associated with the ISFSI. The Updated Risk Assessment updated the dose estimates used to assess risk and the risk estimation.

Q. WHAT DID THE UPDATED RISK ASSESSMENT CONCLUDE?

A. As concluded in the Updated Risk Assessment, both occupational and public dose estimates are within applicable federal regulatory limits. Table 4 of the Updated Risk Assessment shows calculated cancer mortality risks to workers and members of the public for the expanded ISFSI. The Updated Risk Assessment concludes that the most probable outcome is no increase in cancer deaths as a result of radiation exposure due to expansion of the ISFSI. This is the same conclusion as was set forth in the initial risk assessment.

IV. CONCLUSION

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes, it does.

Samuel Hobbs

Summary:

- Radiation Protection Health Physicist at Prairie Island Nuclear Generating Facility (Jan 2011-current)
- Site ALARA Coordinator at Prairie Island Nuclear Generating Facility (Dec 2008-Jan 2011)
- Radiation Protection Specialist at Prairie Island Nuclear Generating Facility (June 2008-Dec 2008)
- Six years as a naval nuclear qualified Machinist's Mate and Engineering Laboratory Technician (Jun 1998-Jun 2004)

Experience:

Radiation Protection Health Physicist

- Owner of site Groundwater Protection Program
- Represent RP group as Outage Readiness coordinator
- Involved in managing site dosimetry program
- Involved in managing site Radiological Environmental Monitoring Program (REMP)
- Owner of radioactive source accountability program
- Involved in maintaining site radiological instruments

Site ALARA Coordinator

- Responsible for maintaining site exposure As Low As Reasonably Achievable
- Represented Radiation Protection group as Human Performance Liaison
- Served as the Radiation Protection Outage Control Center representative during outages
- Represent Radiation Protection group for site software quality assurance
- Led the Radiation Protection group in the implementation of Visual Survey Data System software at the site
- Fleet Subject Matter Expert on Total Exposure Reports
- Responsible for providing ALARA input on all modifications to site property

Radiation Protection Specialist

- Six months experience working as a RPS at Prairie Island Nuclear Generating Facility

Samuel Hobbs

Propulsion Plant Operator

- 4 years operating on a naval nuclear submarine
- Division responsible for all Primary and Secondary chemistry
- Oversaw all maintenance dealing with radiological controls on ship

Work Center Supervisor

- Scheduled and coordinated maintenance for Reactor Laboratories division
- Instructed and supervised personnel during daily operations ensuring maximum effectiveness and productivity.
- Managed inventory and offloading of all radioactive material generated on the ship

Divisional Leading Petty Officer

- Overall responsibility for Reactor Laboratories division.
- Coordinated maintenance and operations with other Engineering divisions on board
- Trained and supervised all junior personnel in division
- Managed and maintained exposure records for all Engineering personnel
- Experience in QA work

Certifications:

National Registry of Radiation Protection Technologists- Feb 2010

Education:

Bachelor of Science in Radiation Health Physics
Oregon State University - Jun 2007
Engineering Laboratory Technician School
Nuclear Prototype Training Unit
Naval Nuclear Power School
Machinist's Mate Nuclear Field A School