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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Director, Office of Nuclear Material Safety and Safeguards
Washington, DC 20555-0001

Pathfinder Generating Station
Docket No. 30-05004
License No. 22-08799-02

Response to Unresolved Items Identified in NRC Pathfinder Generating Station
Decommissioning Inspection Report

- References:
- 1) Xcel Energy, "License Amendment Request to Authorize Decommissioning Activities at Pathfinder", dated February 17, 2004 (ADAMS Accession Nos. ML040620520; ML040630125; ML040630513)
 - 2) Xcel Energy, "USNRC Request for Additional Information", (Supplement to the Decommissioning Plan) dated December 21, 2004 (ADAMS Accession No. ML050100054).
 - 3) NRC letter to Xcel Energy, "License Amendment No. 15", dated May 27, 2005 (ADAMS Accession Nos. ML051430478; ML051430507)
 - 4) NRC letter to Xcel Energy, "NRC Inspection Report 030-05004/06-001", dated November 27, 2006 (ADAMS Accession No. ML063320446).

In Reference 1, Xcel Energy submitted the Pathfinder Decommissioning Plan to the Nuclear Regulatory Commission (NRC) for incorporation into the license. In Reference 2, Xcel Energy submitted a revised final status survey plan as Appendix F to the Decommissioning Plan. The NRC approved the plan in Reference 3.

The NRC conducted a review of the implementation of the final status survey plan and provided the results of the inspection in Reference 4. The inspection report included two unresolved items (URIs). In the inspection report, the NRC requested additional information on the two URIs, including any corrective actions needed or taken, within 30 days of the date of the letter. Xcel Energy is providing the requested information in the Enclosure to this letter.

This letter contains no new commitments and no revisions to existing commitments. No license amendment is being made as a result of this letter.

If you have any questions, please contact the undersigned at (720) 497-2020 or Mr. James J. Holthaus, Radiation Safety Officer, at (715) 377-3380.



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Enclosure

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ENCLOSURE 1

Response to Unresolved Issues in NRC Inspection Report 030-05004/06-001 for Pathfinder Generating Plant Decommissioning Project

On October 2-5, 2006, the Nuclear Regulatory Commission (NRC) conducted an inspection at the former Pathfinder Generating Station in Sioux Falls, South Dakota. The inspection included a review of the implementation of the NRC-approved final status survey plan and the performance of an NRC confirmatory survey to verify if the facility could be released without restriction. The confirmatory survey included radiological measurements of soil, water, and swipe samples collected during the inspection. Dose rate measurements were also conducted at various locations of the site. This inspection resulted in two unresolved items. The NRC requested additional information on these two unresolved items, including any corrective actions needed or taken. The requested information is provided below.

Unresolved Item: Some aspects of the final status survey program were not implemented in accordance with the requirements of the Decommissioning Plan.

The NRC provided details and examples in the inspection report. The examples are provided in bold text below, followed by Xcel Energy's responses.

In the final status survey plan, the licensee committed to implement the recommendations of NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," Revision 1. Following a review of documentation and interviews with site staff, the inspectors concluded that the final status survey packages were developed in compliance with the general requirements of the final status survey plan. However, several examples were identified where the licensee and its contractor deviated from MARSSIM guidance during the implementation of the final status survey packages:

- a. **One survey unit in the Turbine Building was greater than 100 m², the MARSSIM suggested size limit for Class 1 survey units. The proposed size of the turbine building floor survey unit was about 240 m². The inspectors determined that the increased size designation was not safety significant as long as the number of sample points were not adversely impacted. In this particular situation, the licensee's proposed number and representativeness of sample points exceeded the minimum number of sample points identified in MARSSIM.**

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Response:

The initial survey sought to treat the hot side of the Turbine Building basement as a single unit in order to more concisely present the results in the Final Status Survey Report. This single unit survey method resulted in 349 total beta activity measurements on the floor of the hot side of the Turbine Building basement which exceeded the required number of measurements specified in the Decommissioning Plan.

Nevertheless, the final status survey of the hot side of the Turbine Building basement was repeated after several overhead pipes with elevated readings were removed from the area. To facilitate the second final status survey, the hot side of the Turbine Building basement was split into five separate Class 1 survey units. Each survey unit was limited in size to less than 100 m², and now meets the MARSSIM guidance, in accordance with the Final Status Survey Plan.

- b. The licensee elected not to establish a sampling grid for the settling basins and the effluent pathway (drainage ditch), two MARSSIM Class 2 areas, because of actual field conditions. For example, the settling basins contained water such that field gridding was not possible.**

Response:

The gridding requirements in the Decommissioning Plan apply to building surfaces and land areas of a given area and were not considered applicable to long winding pathways or bodies of water. The following alternate survey methods were used to facilitate the final status survey of the effluent discharge pathway and settling basins.

The effluent discharge pathway (drainage ditch), is a winding depression 2 to 5 meters in width extending some 600 meters from the edge of the asphalt behind the Boiler Building and terminating in the Big Sioux River. Routine gridding practices were considered to be ineffective. To meet the gridding and non-biased sampling requirements contained within the Decommissioning Plan, a 20 meter length of rope was used to designate systematic sampling locations in the middle of the effluent discharge pathway every 20 meters, beginning at the edge of the asphalt behind the Boiler Building. Use of

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this technique resulted in 20 systematic sampling locations along the length of the effluent discharge pathway.

In addition to collecting soil samples at each of the designated sampling locations, a minimum of 50% of the land area associated with the effluent discharge pathway was scanned with a sodium iodide detector.

- 2. In accordance with the Decommissioning Plan, the SETTLING BASINS WAERE CLASSIFIED Class 2 survey unit for the purpose of the final status survey plan even through the characterization survey identified this as Class 3. The Class 2 classification was prudent to ensure additional scans of accessible surfaces were performed to identify potential areas of elevated activity. The results of the sample analysis associated with samples collected in or around the settling basins had no licensed activity in excess of 10% of the criteria for release for unrestricted use.*

Due to a large amount of standing water in settling basins, the settling basins were not gridded due to personnel safety concerns. The survey of the settling basins was performed by technicians in knee high boots and secured to safety harnesses. Soil/sediment samples were collected from each side of the four settling basins, at approximately the mid-point of each of the sides and as close to the water as practical. In addition, gamma scans were performed around each of the settling basins over a minimum of 50% of the accessible area. These scans identified an area of elevated activity at the inlet into one of the settling basins that was subsequently determined to be due to non-licensed naturally occurring radioactive material.

From an historical perspective, two settling basins (1 and 2) were in existence during nuclear plant operation. Initially these two basins were used to support the river water treatment system during nuclear plant operation. Modification to the effluent discharge pathway in late 1970 directed all effluent discharge to the settling basins, thus discontinuing use of the drainage ditch. Two additional settling basins were added in the early 1970's to comply with Clean Water Act requirements. Environmental samples collected during the characterization survey in the environs surrounding the Pathfinder Plant, which included the drainage ditch and all the settling basins when dry did not identify any residual radioactivity attributable to licensed radionuclides in excess of Minimum Detectable Activity (MDA).

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- c. **The Hotwell a Class 1 area was not gridded. However, because of its MARSSIM classification, the licensee elected to conduct a 100 percent scan of the structure.**

Response:

The area was re-surveyed using a sodium iodide detector that identified elevated activity requiring remediation. A grid was developed for the condenser hotwell and was used for both exposure rate survey and subsequent final status survey which included exposure rate measurements as well as measurement for total beta and removal beta activity specified in the Decommissioning Plan.

- d. **The licensee also decided not to establish a sampling grid for the condenser floor because of limited accessibility to the area.**

Response:

The remediation activities in the condenser hotwell required a subsequent final status survey of the floor under the condenser as a Class 1 area. A sampling grid was established for a Class 1 survey in accordance with the Decommissioning Plan grid requirements.

Unresolved Item: During the confirmatory survey, two fixed beta contamination sample points, both located in the hotwell, exceeded the release criteria. This finding was a concern because the hotwell had been 100-percent scan surveyed prior to the confirmatory survey and was determined to meet release criteria. The sample points were remediated and resurveyed during the inspection, but the staff did not propose corrective actions necessary to ensure that similar areas of elevated radioactivity have been identified or do not exist.

Additional detail was provided in the inspection report and is provided in bold text below, along with Xcel Energy's response.

Beta particulate contamination measurements were also collected across the site. Most measurements did not exceed the lower limits of detection of the meters, with a few exceptions. Gross beta contamination measurements exceeded the lower limits of detection in the cooling tower basin, hotwell, and bottom two floors of the fuel handling building.

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Two beta surface contamination measurements exceeded the Cobalt-60 acceptance criteria of 7100 dpm/100 cm². Both points were measured in the hotwell. One point measured about 23,500 dpm/100 cm², while the second point measured about 12,600 dpm/100 cm². These two points were presented to the licensee for resolution. Although the licensee could have applied the elevated measurement criteria or some other statistical methodology, the licensee elected to remediate the areas. The licensee remediated and resurveyed these two specific points during the onsite inspection.

The identification of the two elevated sample points in the hotwell was determined to be an unresolved item (030-05004/0601-02), in part, because the hotwell had been 100 percent scan surveyed by the licensee prior to the conduct of the confirmatory survey. Further, the confirmatory survey is not designed to be comprehensive; therefore, additional areas of elevated radioactivity may exist. This issue was identified as an unresolved item pending review of additional information and any measures taken by the licensee to ensure that similar areas of elevated radioactivity have been identified or do not exist.

Response:

During the NRC inspection the inspectors performed a confirmatory survey in the condenser using sodium iodide exposure rate meters. This survey identified two areas of elevated activity that were not identified during the final status survey of the condenser using the Decommissioning Plan approved gas flow proportional beta detectors. One of the areas was in a corner adjacent to two steel plates and the other appeared to be at the base of a vertical support pipe. Both of the areas were subsequently remediated.

Three possible reasons why these two areas were not detected during the final status survey are as follows: 1) The elevated activity was due to a small/microscopic particle sufficiently close to a vertical surface such that it was not detectable due to the edge effect associated with the 126-cm² gas flow proportional detectors; and 2) The elevated activity was shielded in such a way that it was not detectable using the beta sensitive gas flow proportional detectors.

Following the NRC confirmatory survey within the condenser hotwell, a comprehensive exposure rate survey of the condenser was performed for both beta and gamma activity using a gas flow proportional detector and a sodium iodide detector, respectively. Areas of elevated beta

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activity were identified. In all cases, the areas were adjacent to either a vertical surface or at the base of a vertical support pipe. The activity adjacent to the vertical surfaces appeared to be due to a small/microscopic particle. This particle was remediated using a needle gun and HEPA vacuum. The areas of elevated activity at the base of the vertical support pipes were due to activity within the pipes and again appeared to be due to small/microscopic particles.

Although one vertical support pipe was cut open and remediated in support of the investigation into the cause of the elevated activity the remaining pipes could not be removed due to structural concerns. Therefore, a site specific dose calculation will be performed and documented as part of the Final Status Survey Report justifying leaving the remaining activity within the vertical support pipes while allowing for license termination.,

Following the remediation of the elevated activity adjacent to the vertical surfaces and within the vertical support pipe that was cut open, the final status survey was repeated within the condenser. The survey consisted of measurements for total and removable beta activity as specified in the Decommissioning Plan as well as exposure rate measurements. As documented previously, the measurements for total beta activity using the gas flow proportional counters did not identify any areas of elevated activity approaching the criteria for release for unrestricted use. However, the contact exposure rate measurements again identified areas of elevated activity at the base of the vertical support pipes.

Based on this experience in the condenser, additional exposure rate measurements using a sodium iodide detector were taken throughout the Turbine Building in an effort to identify other areas of elevated activity that were not identified using the gas flow proportional counters. These surveys resulted in the removal of additional piping from the hot side of the Turbine Building basement and the Turbine Building mezzanine. This material was shipped to Energy Solutions for final disposition.

The Turbine Building areas requiring remediation were resurveyed and exposure rate measurements were taken to supplement the survey requirements in the Decommissioning Plan.