

References:

1. Letter from David A. Christian (DEK) to Document Control Desk (NRC), "Kewaunee Power Station Application for Renewed Operating License," dated August 12, 2008. [ADAMS Accession No. ML082341020]
2. Letter from Samuel Hernandez (NRC) to David A. Heacock (DEK), "Request for Additional Information For The Review of the Kewaunee Power Station License Renewal Application – Structures Scoping/Fire Protection (TAC No. MD9408)," dated July 16, 2009. [ADAMS Accession No. ML091880555]

Attachment:

1. Response to Request for Additional Information Regarding Structures Scoping and Fire Protection

Commitments made in this letter:

None.

cc:

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ATTACHMENT 1

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING STRUCTURES SCOPING AND FIRE PROTECTION**

**KEWAUNEE POWER STATION
DOMINION ENERGY KEWAUNEE, INC.**

Request for Additional Information (RAI) 2.4-1

Background:

As stated in Section 5.2.1.23.2, Electrical Penetrations, of the Kewaunee Power Station (KPS) updated safety analysis report (USAR), all components of the electrical penetration assemblies are designed to withstand, without damage or interruption of operations, the forces resulting from an earthquake, in addition to the normal and accident design requirements. Table 2.4.1-1, Reactor Containment Vessel, of the license renewal application (LRA) only includes the electrical penetration nozzles. Section 2.4.1 of the LRA (Page 2-206) refers to Section 2.5 for the evaluation of electrical penetration assemblies. Section 2.5 of the LRA states that all reactor containment vessel electrical penetration assemblies are within the scope of the environmental qualification (EQ) program and the subject of a time-limited aging analysis (TLAA).

Issue:

As stated in Section 2.4.1, Reactor Containment Vessel, of the LRA and the KPS USAR, the electrical penetration assemblies are welded to the end of the reactor containment vessel penetration nozzle. Table 2.4.1-1 of the LRA does not list the structural components [e.g., welds between the canister and the nozzle, and canister support (as shown in USAR Figure 5.2- 8)] that support the intended functions of the penetration assembly.

Request:

If these components are not included due to an oversight, please provide a description of the scoping and aging management review (AMR). If they are covered somewhere else in the LRA, please indicate the location. If they are excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

The structural components [e.g., welds between the canister and the nozzle, and canister support (as shown in USAR Figure 5.2- 8)] are considered an integral part of the nozzles that support the electrical penetration assemblies. The nozzle with the integral welds and canister support is within the scope of license renewal and included in the structural member "Electrical Penetration Nozzles" in LRA Table 2.4.1-1.

RAI 2.4-2

Request:

Table 2.4.1-1 of the LRA does not list the concrete/grout fill supporting the reactor containment vessel. If this component is not included due to an oversight, please provide a description of the scoping and AMR. If it is covered somewhere else in the LRA, please indicate the location. If it is excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

As indicated in LRA Section 2.4.1, Reactor Containment Vessel, the Reactor Containment Vessel is supported directly on a grout base with concrete fill placed between the Reactor Containment Vessel's ellipsoidal bottom and the common foundation basemat. The concrete/grout fill is considered an integral part of the common foundation basemat. The basemat with integral concrete/grout fill is within the scope of license renewal and included in the structural member "Reactor Containment Vessel basemat" in LRA Table 2.4.1-1. The associated aging management review results are provided in LRA Table 3.5.2-1.

RAI 2.4-3

Request:

Section 2.4.1 of the LRA states that masonry block walls are installed to provide enclosure for equipment. In contrary, Table 2.4.1-1 of the LRA lists the intended function of masonry block walls as structural support. Please discuss the intended function(s) of masonry block walls.

Dominion Energy Kewaunee Response

The intended function of the masonry block walls located inside the Reactor Containment Vessel is "Enclosure Protection," but was incorrectly indicated as "Structural Support" in LRA Table 2.4.1-1.

RAI 2.4-4

Request:

As stated in Section 2.4.2.1, Shield Building, of the LRA, the double interlocked doors for the shield building personnel access openings are evaluated for AMR with miscellaneous structural commodities. Table 2.4.2-13, Miscellaneous Structural Commodities, does not list the double interlocked doors for shield building personnel access openings. If these components are not included due to an oversight, please provide a description of the scoping and AMR. If they are covered somewhere else in the LRA, please indicate the location. If they are excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

The double-interlocked doors for the personnel access openings are within the scope of license renewal and are included in the structural member "Doors" in LRA Table 2.4.2-13. The associated aging management review results are provided in LRA Table 3.5.2-14.

RAI 2.4-5

Request:

Figure 9.5-2 of KPS USAR shows personnel airlock, shield building airlock and removable precast concrete panel. Table 2.4.2-1 of the LRA only lists equipment opening door and support framing. If the personnel airlock precast concrete panel and support framing is not included due to an oversight, please provide a description of the scoping and AMR. If these components are covered somewhere else in the LRA, please indicate the location. If they are excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

The removable precast concrete panel shown in USAR Figure 9.5-2 forms the wall at the Shield Building airlock cubicle opening and is considered part of the Shield Building personnel airlock cubicle. The removable precast concrete panel is within the scope of license renewal and is included in the structural member "Structural Reinforced Concrete (cubicles for airlocks)" in LRA Table 2.4.2-3, "Auxiliary Building." The support framing for the precast panel is also within the scope of license renewal and is included in the structural member "Miscellaneous Steel" in LRA Table 2.4.2-3. The associated aging management review results for these structural members are provided in LRA Table 3.5.2-4.

RAI 2.4-6

Request:

Based on a review of Section 2.4.2.3, Auxiliary Building, of the LRA and Table 2.4.2-3, it is not clear if the following items have been included in the scope of license renewal and subject to an AMR:

- 1. Missile shields for service water system piping, and*
- 2. Fuel transfer canal stainless steel liner*

If these components are not included due to an oversight, please provide a description of the scoping and AMR. If they are covered somewhere else in the LRA, please indicate the location. If they are excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

The missile shields for the Service Water System piping described in LRA Section 2.4.2.3 are within the scope of license renewal, but were incorrectly omitted from the screening results in LRA Table 2.4.2-3 and the associated aging management review results provided in Table 3.5.2-4. The steel missile shields perform a missile barrier intended function and are exposed to “air-indoor uncontrolled” and “borated water leakage” external environments. The aging effects of loss of material due to corrosion and loss of material due to boric acid corrosion will be managed with the Structures Monitoring Program and the Boric Acid Corrosion program, respectively.

The fuel transfer canal stainless steel liner is within the scope of license renewal and is included in the structural member “Spent fuel pool liner” in LRA Table 2.4.2-3. The associated aging management review results for the spent fuel pool liner are provided in LRA Table 3.5.2-4.

RAI 2.4-7

Request:

As stated in Section 2.4.2.5, Technical Support Center, of the LRA, the metal siding attached to the masonry block walls is not within the scope of license renewal. The levels above the basement of Technical Support Center (TSC) are designated as Class III in Table B.2-1 of KPS USAR. As stated in Section 2.1.3.6.3 of the LRA, Class III* structural members are included in the scope of license renewal. Since there is no exception in Table B.2-1 for metal siding classification, please provide justification for its exclusion from the scope of license renewal.*

Dominion Energy Kewaunee Response

As indicated in LRA Section 2.1.3.6.3, Seismic (II/I), structural members classified as Nuclear Safety Design Class I* or III*, were included within the scope of license renewal per 10 CFR 54.4(a)(2) and further evaluated during the structural screening process to determine if an aging management review was required.

Since the levels above the basement of the Technical Support Center (TSC) are classified as Class III* in USAR Table B.2-1, an evaluation of the metal siding was performed during the structural screening process. The evaluation determined that the metal siding attached to the masonry block walls is not credited for any load carrying capabilities in the TSC seismic analysis and therefore, does not perform a license renewal intended function. Consequently, the metal siding attached to the masonry block walls in the TSC has not been included in the scope of license renewal.

RAI 2.4-8

Request:

Table B.2-1 and Figure 1.2-11 of KPS USAR refer to the TSC as a one story building (first floor at elevation 606 feet). Section 2.4.2.5 of the LRA refers to the TSC as a two-level building. Please provide further explanation relative to the TSC building configuration.

Dominion Energy Kewaunee Response

The Technical Support Center (TSC) consists of a basement, a first floor, and a second floor. The basement and first floor, indicated in Table B.2-1 and USAR Figure 1.2-11, were constructed in the 1980's. The second floor was added in the 2004 time frame. Revision 20 of the KPS USAR, provided with the license renewal application (LRA), did not reflect the addition of the second floor to the TSC. The addition of the second floor has been incorporated in Revision 21 of the USAR. Therefore, the building configuration of the TSC described in LRA Section 2.4.2.5 is correct.

RAI 2.4-9

Request:

Jet impingement barrier, located in the turbine building, is shown in Figure 10A.3-27 of KPS USAR. Table 2.4.2-6, Turbine Building, of the LRA does not list any jet impingement barrier or encapsulation sleeve. If these components are not included due to an oversight, please provide a description of the scoping and AMR. If they are covered somewhere else in the LRA, please indicate the location. If they are excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

The jet impingement barrier located in the Turbine Building, as shown on USAR Figure 10A.3-27, is within the scope of license renewal and included in the component type "Piping Sleeves" in LRA Table 2.3.4-2, Main Steam and Steam Dump. The associated aging management review results are provided in LRA Table 3.4.2-2. The reference to USAR Figure 10A.3-27 was incorrectly omitted from footnote 1 of LRA Table 3.4.2-2.

RAI 2.4-10

Request:

Section 2.6.2 of KPS USAR (Page 2.6-2) states the following:

“The most recent occurrence of shore erosion was during construction of the plant in 1969. Wave erosion during a severe storm undercut the bank at the promontory protruding into the lake at the southeast end of the site. The damage was repaired and the bank was stabilized with large riprap, which also serves to protect the circulating water discharge.”

Section 2.4.2.8 of the LRA, Discharge Structure, states that the riprap stones paving the nearshore portion of the basin help serve the function of exit velocity dissipation and therefore do not serve a license renewal intended function. Since the riprap is installed for protection of the discharge structure as stated in KPS USAR, please provide further justification for exclusion of riprap paving the near-shore portion of the basin and the riprap installed outside the sheet pile walls from the scope of license renewal.

Dominion Energy Kewaunee Response

The riprap paving the near-shore portion of the basin and the riprap installed outside the sheet pile wall are excluded from the scope of license renewal because they do not perform a license renewal intended function. Specifically, the discharge water would not be prevented from returning to the lake if erosion of the riprap occurred. Additionally, the design of the discharge structure and sheet pile wall is not based on riprap protection being installed outside the sheet pile wall. The riprap is provided as a good engineering practice to help prevent shore erosion in these areas that might occur from storms or wave run-up.

RAI 2.4-11

Request:

Section 2.4.2.10 of the LRA, Intake Structure, states that the inlet cones discharge their water through 6-foot diameter outlet pipes into a 10-foot diameter steel intake pipe. Section 2.4.2.10 of the LRA also states that the 10-foot diameter pipe is evaluated with the circulating water system. However, the staff found that the 6-foot outlet pipes are not included in Table 2.4.2-10 of the LRA. If they are covered somewhere else in the LRA, please indicate the location. If they are excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

The 6-foot diameter outlet pipes are within the scope of license renewal. The outlet pipes are considered part of the inlet cones and are included in the structural member "Inlet Cones" in LRA Table 2.4.2-10. The associated aging management review results are provided in LRA Table 3.5.2-11.

RAI 2.4-12

Request:

Section 10.2.2.8 of KPS USAR (Page 10.2-12) states that the plant intake is equipped with two auxiliary water intake tees 50 and 100 feet shoreward of the intake crib. Section 2.4.2.10 and Table 2.4.2-10 of the LRA do not list these components. If these components are not included due to an oversight, please provide a description of the scoping and AMR. If they are covered somewhere else in the LRA, please indicate the location. If they are excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

The two auxiliary water intake tees located 50 and 100 feet shoreward of the intake cones are located in the 10-foot diameter steel intake pipe and are within the scope of license renewal. The 10-foot diameter steel intake pipe, including the two auxiliary water intake tees, is evaluated for aging management with the Circulating Water System and included in the component type "Pipe" in LRA Table 2.3.3-20, Circulating Water. The associated aging management review results are provided in LRA Table 3.3.2-20.

RAI 2.4-13

Request:

Table 2.4.2-11, Screenhouse, of the LRA does not include the forebay overflow weir. If this component is covered somewhere else in the LRA, please indicate the location. If it is excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

As indicated in LRA Section 2.4.2-11, the Screenhouse structure includes a forebay area, which is an open concrete structure with an overflow weir. The overflow weir is constructed in the lakeward concrete wall of the forebay. The forebay and overflow weir are within the scope of license renewal and included in the structural member "Structural Reinforced Concrete (Foundation mat, walls, beams, columns, floor slabs, roof slab)" in LRA Table 2.4.2-11. The associated aging management review results are provided in LRA Table 3.5.2-12.

RAI 2.4-14

Request:

Referring to LRA Table 2.4.2-13, please confirm if the following component types are covered somewhere else in the LRA. If they are excluded from the scope of license renewal, please provide the basis for the exclusion.

- *Grout pads for building structural column base plates*
- *Vibration isolators*
- *Waterproofing membrane*
- *Waterstops*
- *Anchor bolts and expansion anchors*
- *Damper framing*

Dominion Energy Kewaunee Response

Grout pads for building structural column base plates

Grout pads for building structural column base plates are installed underneath the column base plates that are supported by concrete members such as foundations, floor slabs, and walls. The grout pads are within the scope of license renewal and considered an integral part of the supporting concrete member. The grout pads are included in the structural member "Structural Reinforced Concrete" in LRA Table 2.4.1-1 (floor slab), LRA Table 2.4.2-3 (slabs and walls), and LRA Table 2.4.2-5 (foundation mat slab and floor slabs). The grout pads for the Turbine Building are included in the structural member "Foundation Basemat" in LRA Table 2.4.2-6.

Vibration isolators

Elastomer vibration isolators are used with some of the supports for mechanical equipment and are within the scope of license renewal. The vibration isolators are included as part of the component type/structural member "Supports for Mechanical Equipment" in LRA Table 2.4.2-12. The associated aging management review results are provided in LRA Table 3.5.2-13.

Water proofing membrane

Water proofing membrane is a non-safety-related structural commodity that does not perform a license renewal intended function and therefore, is not within the scope of license renewal. Although interior concrete surfaces may be exposed to groundwater if seepage occurs, groundwater seepage is not expected to continue for an extended period of time since the discovery of any leakage would be entered into the corrective action system for evaluation and repair as required. Therefore, necessary repairs would

be completed prior to loss of the intended function of the concrete component. Additionally, a review of plant operating experience has not identified any concerns related to concrete degradation due to groundwater seepage.

Waterstops

Waterstops are a non-safety-related structural commodity that do not perform a license renewal intended function and therefore, are not within the scope of license renewal. Although interior concrete surfaces may be exposed to groundwater if seepage occurs, groundwater seepage is not expected to continue for an extended period of time. Therefore, necessary repairs would be completed prior to loss of the intended function of the concrete component. Additionally, a review of plant operating experience has not identified any concerns related to concrete degradation due to groundwater seepage.

Anchor bolts and expansion anchors

Anchor bolts and expansion anchors used in structural applications are within the scope of license renewal. The embedded portion of the anchor bolts and expansion anchors is surrounded by concrete and is considered an integral part of the concrete. Therefore, the embedded portion of the anchor bolts and expansion anchors are evaluated along with the concrete in which it exists. The portion of the anchor bolts that is not embedded in concrete is evaluated in the aging management review as part of the structural member it is supporting.

Damper framing

Damper framing is within the scope of license renewal and is identified as the component type "Damper Housings" in the screening results tables in LRA Section 2.3, Scoping and Screening Results: Mechanical Systems and the associated aging management review Tables in Section 3.4.

RAI 2.4-15

Request:

The foundations for reserve auxiliary and tertiary auxiliary transformers are included in the scope of license renewal as stated in Section 2.4.2.7, Yard Structures, of the LRA. Table B.2-1 of the KPS USAR lists other Class I and II transformers. If the support structures for these transformers are covered somewhere else in the LRA, please indicate the location. If they are excluded from the scope of license renewal, please provide the basis for the exclusion.

Dominion Energy Kewaunee Response

USAR Table B.2-1 identifies the Reserve Auxiliary Transformer (RAT), the Tertiary Auxiliary Transformer (TAT), the Start-Up Transformer and the transformer serving the pressurizer heater from the safety features bus as Class II structures. The 4.16 – 0.480 kV safety features transformers are also identified in USAR Table B.2.1, but as a Class I structure.

As stated in LRA Section 2.4.2.7, the RAT and the TAT are within the scope of license renewal and included LRA Table 2.4.2-7.

The Start-Up Transformer is the same transformer as the RAT and is incorrectly listed in USAR Table B.2.1. This error has been previously identified and will be corrected in the next scheduled revision of the USAR in accordance with 10 CFR 50.70(e).

The Class II transformer serving the pressurizer heater from safety features bus is located within the Auxiliary Building and is within the scope of license renewal. The foundation for this transformer is included in the structural member “Equipment pads / grout” in LRA Table 2.4.2-3, Auxiliary Building. The associated aging management review results are provided in LRA Table 3.5.2-4.

The Class I, 4.16 – 0.480 kV safety features transformers are located inside the safeguards alley of the Turbine Building and are within the scope of license renewal. The foundations for these transformers are included in the structural member “Equipment pads / grout” in LRA Table 2.4.2-6, Turbine Building. The associated aging management review results are provided in LRA Table 3.5.2-7.

RAI 2.3.3.18-1

Background:

For KPS, the staff reviewed the LRA; drawings; updated safety analysis report, Sections 7.7.5, 8.2.2, 9.6.1, and Table B.2-1; and the following fire protection current licensing basis documents listed in the KPS Operating License Condition 2.C(3):

Safety Evaluation Reports dated November 25, 1977, December 12, 1978, and supplement issued on February 13, 1981.

Issue:

The staff has identified that fire protection systems and components discussed in the following sections have been excluded from the scope of license renewal and an AMR. These systems and components were not included in the license renewal boundaries and appear to have fire protection intended functions required for compliance with Title 10 of the Code of Federal Regulations (CFR) 50.48, "Fire protection," as stated in 10 CFR 54.4. Therefore, in order to complete our review, the staff requires responses to the following RAIs:

Request:

The LRA drawing LRM-202-3 show fire hose connections at locations F9, F10, F11, G9, G10, and G11 as out of scope (i.e., not colored in brown). The staff requests that the applicant verify whether the above fire hose connections are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If these hose connections are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Dominion Energy Kewaunee Response

These non-safety-related fire hose connections shown at locations F-9, F-10, F-11, G-9, G-10, and G-11 on license renewal drawing LRM-202-3 are used only for non-fire purposes (e.g. station services) and do not perform a license renewal intended function. Additionally, these hose connections are not credited as seismic anchors and LR Notes 6 and 7 on license renewal drawing LRM-202-3 indicate why the service water lines associated with the hose connections are omitted from the scope of license renewal for spatial considerations under 10 CFR 54.4(a)(2).

RAI 2.3.3.18-2

Request:

The LRA drawing LRM-208-1 shows fire hydrant and hose houses as being in the scope of license renewal and subject to an AMR. However, LRA drawing LRM-208-1 shows fire hose cabinets at locations G6 and H6 as out of scope (i.e., not colored in blue). The staff requests that the applicant verify whether the above fire hose cabinets are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If these cabinets are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Dominion Energy Kewaunee Response

As indicated in LRA Section 2.1.5.4, supports are evaluated as commodities within in-scope structures. The fire hose cabinets are within the scope of license renewal per 10 CFR 54.4(a)(3) because they support fire protection and therefore, are evaluated as commodities. The fire hose cabinets are included in the component type/structural member "Supports for Miscellaneous Components - fire hose stations" in LRA Table 2.4.2-12, Component Supports and the associated aging management review results are provided in LRA Table 3.5.2-13. Items treated as commodities, such as the fire hose cabinets mentioned in this RAI, are not highlighted on license renewal drawings.

RAI 2.3.3.18-3

Request:

The LRA drawing LRM-208-3 shows fire department connections and associated components at locations B1, C1, and D1 as out of scope (i.e., not colored in blue). The staff requests that the applicant verify whether the fire department connections and associated components are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Dominion Energy Kewaunee Response

The fire department connections and associated components shown at locations B-1, C-1, and D-1 on license renewal drawing LRM-208-3 provide fire protection for the Administration Training Facility (ATF). The ATF is physically separated from the plant power block and is not included within the scope of license renewal. Therefore, the fire protection piping inside the ATF and the fire department connections and associated components do not perform a license renewal intended function and have not been included within the scope of license renewal.

RAI 2.3.3.18-4

Request:

Section 4.3.1.5 of the KPS Safety Evaluation Report, dated December 22, 1978, states that "...Automatic water spray system[s] are provided on combustibile liquid hazards in the turbine building (hydrogen seal oil unit, oil storage reservoirs), the heating boiler fuel oil pumps in the auxiliary building, and in the oil-filled transformer in the yard areas..." LRA drawing LRM-208-3 shows only the yard area oil-filled transformer automatic water spray system as being in the scope of the license renewal and subject to an AMR. The staff requests that the applicant verify whether the automatic water spray systems for the hydrogen seal oil unit, oil storage reservoirs, and heating boiler fuel oil pumps are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Dominion Energy Kewaunee Response

The automatic water spray systems for the hydrogen seal oil unit, oil storage reservoirs, and heating boiler fuel oil pumps are within the scope of license renewal and included in the component groups "Pipe", "Sprinkler Heads" and "Valves" in LRA Table 2.3.3-18. The associated aging management review results are provided in LRA Table 3.3.2-18.

The license renewal drawing and locations identifying the automatic water spray systems for the hydrogen seal oil unit, oil storage reservoirs, and heating boiler fuel oil pumps are provided below:

- Hydrogen Seal Oil Unit – License renewal drawing LRM-208-1 at location D-6 (labeled "2" to Hydrogen Seal Oil Unit, See Detail 1").
- Oil Storage Reservoir - License renewal drawing LRM-208-1 at location C-7 (labeled "To Turbine Oil Storage Tank Area Sprinkler System") and license renewal drawing LRM-208-3 at location D-8 (labeled "To Turb Oil Storage").
- Heating Boiler Fuel Oil Pumps - License renewal drawing LRM-208-1 at location D-7 (labeled "1½" To Heating Boiler Fuel Oil Pump Area Sprinkler System (BSMT. Floor) See Detail 2)" and license renewal drawing LRM-208-3 at location F-11 (labeled "To Heating Boiler Sprinkler System").

RAI 2.3.3.18-5

Request:

Section 4.3.1.5 of the KPS Safety Evaluation Report, dated December 22, 1978, states that "...wet pipe sprinklers [are provided] on safety-related electrical cable in fire area AX-32, in the hallway of the screenhouse (area SC70), and [there is a plan to] to convert the existing wet pipe system in the working material storage (auxiliary building) to a deluge system..." The wet pipe and deluge sprinkler systems do not appear in LRA Section 2.3.3.18 or LRA drawings as being in the scope of the license renewal and subject to an AMR. The staff requests that the applicant verify whether the above wet pipe and deluge systems are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Dominion Energy Kewaunee Response

The wet pipe and deluge sprinkler systems mentioned above are within the scope of license renewal and included in the component groups "Pipe," "Sprinkler Heads" and "Valves" in LRA Table 2.3.3-18. The associated aging management review results are provided in LRA Table 3.3.2-18.

The license renewal drawing and locations identifying the wet pipe and deluge sprinkler systems mentioned above are provided below:

- Safety-related electrical cable in fire area AX-32 – License renewal drawing LRM-208-1 at location F-7 labeled "To Cable Tray Fire Protection" and license renewal drawing LRM-208-3 at location F-12 labeled "To Cable Tray Sprinkler System."
- Screenhouse Hallway (area SC70) - License renewal drawing LRM-208-1 at location E-3 labeled "Screen House Tunnel Cable Tray Sprinkler System."
- Working Material Storage Area – License renewal drawing LRM-208-1 at location D-8 labeled "To Working Mat'l Storage Area Sprinkler System" and license renewal drawing LRM-208-3 at location D-10 also labeled "To Working Mat'l Storage Area Sprinkler System." This system was converted to a deluge sprinkler system in 1979.

RAI 2.3.3.18-6

Request:

Section 4.3.1.6 of the KPS Safety Evaluation Report, dated December 22, 1978, states that "...One portable foam nozzle and foam concentrate is available. The plant had no fixed foam system prior to this review; however, the licensee has installed an automatic foam suppression system on each of the two reactor coolant pumps..." The automatic foam suppression system for the two reactor coolant pumps does not appear in LRA Section 2.3.3.18 or LRA drawings as being in the scope of the license renewal and subject to an AMR. The staff requests that the applicant verify whether the automatic foam system for reactor coolant pumps is in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If the foam system is excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Dominion Energy Kewaunee Response

The foam suppression system for the reactor coolant pumps was replaced by a Reactor Coolant Pump Motor Oil Collection System in 1982 in accordance with 10 CFR 50, Appendix R. The NRC was notified of this modification by letter dated February 28, 1983 from Mr. C. W. Giesler (WPSC) to the NRC, which transmitted the 1982 Annual Operating Report.

The Reactor Coolant Pump Motor Oil Collection System is within the scope of license renewal and included in the component types "Drip Pans and Enclosures," "Flexible Hoses," "Pipe" and "Reactor Coolant Pump Oil Collection Tank" in LRA Table 2.3.3-18. With the exception of pipe, LRA Table 2.3.3-18 includes a footnote for these items indicating that they are not shown on the Fire Protection System license renewal drawings. The associated aging management review results are provided in LRA Table 3.3.2-18.

RAI 2.3.3.18-7

Request:

The Safety Evaluation Report, dated December 22, 1978, listed various types of fire water suppression systems provided in the plant areas for fire suppression activities. The fire suppression systems in various areas are:

- *Service Room (fire area AX-32) automatic wet pipe sprinkler system*
- *Turbine lube oil reservoirs deluge system*
- *Charcoal filter deluge system*

The staff requests that the applicant verify whether the above fire suppression systems installed in the plant are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provides justification for the exclusion.

Dominion Energy Kewaunee Response

The fire water suppression systems for the areas mentioned above are within the scope of license renewal and shown on the license renewal drawings indicated below.

- Service Room (fire area AX-32) – As indicated in Section 5.7 of the Safety Evaluation Report, dated December 12, 1978, the Service Room refers to an area which contains electrical cables on trays and in conduit for redundant safety-related systems. License renewal drawing LRM-208-1 at location F-7 (labeled “To Cable Tray Fire Protection”) and license renewal drawing LRM-208-3 at location F-12 (labeled “Cable Tray Sprinkler System”).
- Turbine Lube Oil Reservoir Deluge System – License renewal drawing LRM-208-1 (labeled “To Oil Reservoir and Conditioner Sprinkler System”) at location F-5 and license renewal drawing LRM-208-3 at location F-5 (labeled “To Oil Reservoir Sprinkler System”).
- Charcoal Filter Deluge System - The charcoal filter deluge system is supplied by the Service Water System as shown on license renewal drawing LRM-606 at the locations B-1, C-1, E-1, F-1, B-6.5, C-6.5, E-6.5, F-6.5 and C-8.5.

The components for the service room and turbine lube oil reservoir deluge system are included in the component type “Pipe,” “Sprinkler Heads” and “Valves” in LRA Table 2.3.3-18 and the associated aging management review results are provided in LRA Table 3.3.2-18. The components of the charcoal filter deluge system are included in the component type “Pipe,” “Spray Nozzles”, and “Valves” in LRA Table 2.3.3-6 and the associated aging management review results are provided in LRA Table 3.3.2-6.

RAI 2.3.3.18-8

Background:

The interim Technical Specifications attached to a November 25, 1977 letter to Wisconsin Public Service Corporation, listed various areas of the plant as being protected with a low pressure CO2 fire suppression system. The CO2 fire suppression system serves the following areas:

- *Adjacent to Steam Generator Blowdown Tank Room AX-20*
- *Adjacent to 4160 Volt Switchgear Room AX-21*
- *Adjacent to Special Ventilation Room AX-23*
- *Relay Room AX-30*
- *Adjacent to Service Room- AX-32*
- *Diesel Generator 1-A TU-90*
- *Diesel Generator 1-A, Day Tank Room TU-91*
- *Diesel Generator 1-B TU-92*
- *Diesel Generator 1-B, Day Tank Room TU-93*
- *Air Compressor and Pump Room TU-95*
- *Battery Room 1-A TU-97*
- *Battery Room 1-B TU-98*

Issue:

The LRA, Section 2.3.3.18, states that, "...The CO2 storage tank primarily supplies CO2 for automatic total flooding protection for diesel generator rooms and also supplies CO2 to manual hose stations at various location in the Turbine Building and the Auxiliary Building..." It is not clear from review of Section 2.3.3.18 of the LRA that the total flooding automatic CO2 fire suppression system installed in all areas listed above is included within the scope of license renewal and subject to an AMR.

Request:

The staff requests that the applicant verify whether the total flooding automatic CO2 fire suppression system installed in above areas is in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If it is excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

Dominion Energy Kewaunee Response

A letter dated November 25, 1977 from Karl R. Goller (NRC) to Mr. E. W. James (WPSC), provided the Interim Technical Specifications on fire protection and listed the above areas in Section 3.15(d). A letter dated December 16, 1977 from Mr. E. W. James (WPSC) to Mr. Karl R. Goller (NRC) proposed a revision to the Interim Technical Specifications that corrected the list of areas serviced by the low pressure fire protection CO2 systems. Specifically, the areas identified as "Adjacent to the Special Ventilation Area" and "Adjacent to the Service Room" were removed from the list. A letter dated March 3, 1978 from Mr. A Schwencer (NRC) to Mr. E. W. James (WPSC) subsequently issued the revised Technical Specifications for fire protection as Amendment No. 20 to the Operating License.

The fire protection system LCOs and surveillance requirements were removed from the Technical Specifications and relocated to the Fire Protection Program, by letter dated March 4, 1991 from Mr. M. J. Davis (NRC) to Mr. K. H. Evers (WPSC). The Updated Safety Analysis Report incorporates the Fire Protection Program Plan by reference. The Fire Protection Program Plan states that the following low-pressure CO2 fire suppression systems shall be operable whenever equipment or components in the area(s) being protected is required:

1. Relay Room (AX-30)
2. Diesel Generator 1A (TU-90) and Day Tank Room (TU-91)
3. Diesel Generator 1B (TU-92) and Day Tank Room (TU-93)
4. CO2 Hose Station adjacent to Battery Rooms 1A (TU-97) and IB (TU-98).
5. CO2 Hose station adjacent to Air Compressor and Pump Room (TU-95)
6. CO2 Hose station adjacent to 4160 Volt Switchgear Room (AX-21) and Blowdown Tank Rooms (AX-20)

As indicated in LRA Section 2.3.3.18, the evaluation boundary for the Fire Protection System includes the CO2 and Halon gaseous suppression systems. Therefore, the entire low-pressure CO2 fire suppression system has been included within the scope of license renewal and the areas identified above are shown on the license renewal drawings as indicated below. As indicated, some of these areas are not automatic suppression systems as implied in the RAI:

- Relay Room (AX-30) – License renewal drawing LRM-384 at locations A-10/A-11 labeled "Relay Room." This is a manual trip total flooding system. Additionally, the Relay Room has a hose station (Hose Reel No. 3) shown at the same drawing locations.
- Diesel Generator 1A (TU-90) and Day Tank Room (TU-91) - License renewal drawing LRM-384 at locations E-6 labeled "To Diesel Generator 1A Area Discharge Nozzles." This is an automatic total flooding system.

- Diesel Generator IB (TU-92) and Day Tank Room (TU-93) - License renewal drawing LRM-384 at locations E-4 labeled "To Diesel Generator 1B Area Discharge Nozzles." This is an automatic total flooding system.
- Hose Station adjacent to Battery Rooms 1A (TU-97) and IB (TU-98) - License renewal drawing LRM-384 at locations B-11/B-12 labeled "To Turbine Room Mezz. Floor 4160V SWGR. Bus (Hose Reel No. 2)."
- Hose Station adjacent to Air Compressor and Pump Room (TU-95) – License renewal drawing LRM-384 at locations D-11/D-12 labeled "To Turbine Room BSMT. Floor 480V SWGR. Bus (Hose Reel No. 1)."
- Hose station adjacent to 4160 Volt Switchgear Room (AX-21) and S/G Blowdown Tank Rooms (AX-20) – License renewal drawing LRM-384 at Coordinates A-2/A-3 labeled "To Main 4160 V SWGR. Bus BSMT. Floor (Hose Reel No. 4)."

The components of the low-pressure CO₂ fire suppression systems identified above are included in the component types "Hose Reels/Stations," "Nozzles," "Odorizers," "Pipe," and "Valves" in LRA Table 2.3.3-18. The associated aging management results are provided in LRA Table 3.3.2-18.

RAI 2.3.3.18-9

Request:

The LRA, Table 2.3.3.18, excludes several types of fire protection components that appear in the Safety Evaluation Report, dated December 22, 1978. These components are listed below:

- *hose racks*
- *pipe fittings*
- *pipe supports*
- *dikes for oil spill confinement*
- *floor drains and curbs for fire water*

For each, determine whether the component should be included in Tables 2.3.3-18 and 3.3.2-18, and, if not, justify the exclusion.

Dominion Energy Kewaunee Response

The above fire protection components are within the scope of license renewal and evaluated for aging management. Identified below are the LRA tables that contain the screening and aging management review results for each component.

- **Hose Racks** - Hose racks are evaluated as a commodity and are included in the commodity type/structural member "Supports for Miscellaneous Components (fire hose stations)" in LRA Table 2.4.2-12, Component Supports. The associated aging management review results are provided in LRA Table 3.5.2-13.
- **Pipe Fittings** - Pipe fittings are included in the component type "Pipe" in LRA Table 2.3.3-18. The associated aging management review results are provided in LRA Table 3.3.2-18. Note that LRA Section 2.1.5.1 indicates that "Pipe" includes piping and all of the associated fittings, flanges (including blind and spectacle), elbows, reducers, welds, drain lines, vent lines, end caps, threaded plugs, fill connections, funnels, and access ports such as manholes.
- **Pipe Supports** - Pipe supports for fire protection piping are evaluated as a commodity and are included in the commodity type/structural member "Supports for Piping and Components" in Table 2.4.2-12. The associated aging management review results are provided in LRA Table 3.5.2-13.
- **Dikes for oil spill confinement** - Dikes for oil spill confinement are located in the Turbine Building and evaluated as an inherent part of the structure. The concrete dikes are included in the structural member "Structural Reinforced

Concrete (slabs, beams, columns, and walls)" in LRA Table 2.4.2-6. The associated aging management review results are provided in LRA Table 3.5.2-7.

- Floor drains – As indicated in LRA Section 2.1.3.6.4, floor drainage outside of the Reactor Containment Vessel that is credited for protecting safety-related equipment has been included within the scope of license renewal per 10 CFR 54.4(a)(2) and evaluated for aging management with Miscellaneous Drains and Sumps System. These floor drains are included in the component type "Pipe" in LRA Table 2.3.3-26, Miscellaneous Drains and Sumps. The associated aging management review results are provided in LRA Table 3.3.2-26.
- Curbs for fire water - Steel curbing for fire water is located in the Auxiliary Building, Turbine Building, and Screenhouse and evaluated with the associated structure. The steel curbing is included in the structural member "Miscellaneous Steel [embedded steel exposed surfaces (shapes, plates, unistrut, etc.) ladders, gratings, checkered plates, stairs, handrails]" identified in LRA Tables 2.4.2-3, 2.4.2-6, and 2.4.2-11. The associated aging management review results are provided in LRA Tables 3.5.2-4, 3.5.2-7, and 3.5.2-12.

RAI 2.3.3.18-10

Background:

The, LRA Section 2.3.3-18, states that, ‘...The water-based fire suppression subsystem, which takes water from Lake Michigan, consists of two fire pumps, a jockey pump, main and branch supply line piping...’

Issue:

The LRA, Section 2.3.3.18, discusses requirements for the fire water supply system but does not mention trash racks and traveling screens for the fire pump suction water supply. Trash racks and traveling screens are located upstream of the fire pump suction to remove any major debris from the fresh or raw water to prevent clogging of the fire protection water supply system. Trash racks and traveling screens are typically considered to be passive, long-lived components. Both the trash racks and traveling screens are located in a fresh or raw water/air environment and are typically constructed of carbon steel. Carbon steel in a fresh or raw water environment or water/air environment is subject to loss of material, pitting, crevice formation, and microbiologically influenced corrosion and fouling.

Request:

Explain the apparent exclusion of the trash racks and traveling screens that are located upstream of the fire pump suction from the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1).

Dominion Energy Kewaunee Response

The Trash Racks are within the scope of license renewal and included in the structural member “Trash Grilles” and “Trash Grilles Anchorage” in LRA Table 2.4.2-10, Intake Structure. The associated aging management review results are provided in LRA Table 3.5.2-11.

The traveling water screens are within the scope of license renewal. As indicated in LRA Section 2.3.3.6, Service Water System, the passive portions of the traveling water screens (frames and covers) are evaluated for aging management with the Screenhouse structure. The frames and covers are included in the structural member “Traveling water screen support frame” and “Traveling water screen covers”, respectively, in LRA Table 2.4.2-11, “Screenhouse.” The associated aging management review results are provided in LRA Table 3.5.2-12.