1. The request to by Xcel Energy to change spent fuel storage technology is too vague and undefined.

a. Precisely, what new spent fuel storage technologies are being considered and proposed?

Response: Xcel Energy is proposing to use different spent fuel cask designs from the current TN-40 model in use today (TN-40s were selected in 1989). The designs being considered are typically referred to as welded canister-based storage systems versus the TN-40 bolted metal cask design. Designs we are considering are all safety-related approved by the NRC.

i. What are each of their characteristics?

Response: The TN-40 design is a two-layer steel design, with an inner steel shell that provides confinement of the spent fuel and an integral outer steel shell that provides additional shielding of the radiation emitted by the fuel and provides protection from external hazards to the inner confinement shell. A lid with two metallic seals is bolted to the inner confinement shell.

The canister-based designs we are considering also uses two layers, one for confinement and a second for shielding and protection. The primary differences are 1) the outer layer is concrete vs steel, and 2) two separate lids are welded to the inner confinement shell vs one lid and two seals as on the TN-40s.

Both designs provide redundant sealing of the spent fuel from the atmosphere.

b. What is the industry experience with each of those specific technologies?

Response: The canister-based designs have become the industry standard for the dry storage of spent fuel. They are currently in use at over 60 U.S. nuclear power plants (roughly 3,000 canisters in U.S.). While other sites have used the bolted cask designs, like the TN-40, no other sites are currently loading fuel into a bolted cask.

The two major suppliers of canister-based systems are Holtec International with 1,657 Holtec casks is use, and Orano with 1,205 NUHOMS canisters in use today.

As a comparison there are currently 203 TN-type metal casks is use (TN-32, TN-40, and TN-68).

c. What is the useful life and warranty period for the current casks?

Response: All cask designs have a similar initial NRC license for up to 40 years. After 40 years, continued use is allowed via an NRC license renewal process that examines age related effects and places the appropriate monitoring program in effect based on the cask design.

d. What is the useful life and warranty period for each alternative spent fuel storage technology Xcel is considering?

Response: Same as 1.b. above.

e. What are the alternate spent fuel storage technology manufacturer's recommendations on use and storage?

Response: Each manufacturer provides detailed procedures for loading their cask design. Details regarding the specific operations vary slightly, but all follow a similar general sequence for use and storage. Critical parameters that must be maintained are identified in the NRC license.

f. What is the industry experience with each proposed alternate spent fuel technology Xcel is considering?

Response: See 1.b. above.

g. What additional monitoring and maintenance can be anticipated with the new casks and how does this differ from the current casks?

Response: Typical monitoring for canister systems involves verifying air ducts used to remove heat are free from obstruction. This is normally accomplished either by visual observation or monitoring of temperature sensors placed at the outlets.

Casks usually have no expected routine maintenance other than periodic monitoring of the exterior for any damage or degradation, which would then be repaired using standard concrete maintenance practices. This is similar to the TN-40 monitoring requirements.

h. What is the replacement cycle for each of the proposed new spent fuel storage technologies?

Response: Casks do not have a specific life cycle defined. They are monitored for aging through an NRC mandated aging management program.

The NRC has assessed cask life and reached the following conclusion:

> *"Based on currently available information, the 100-year replacement cycle provides a reasonably conservative assumption for a storage facility that would require replacement at a future point in time. However, this assumption does not mean that dry cask storage systems and facilities need to be replaced every 100 years to maintain safe storage."*

i. How do the alternate storage technologies compare with the purported "robustness" of the current casks as Xcel presented in 2008? For example, what are the components that make up the alternatives?

Response: All designs meet the same stringent NRC requirements and would be considered equally "robust." Both use high quality steel for the primary confinement of the fuel. The TN-40 uses additional steel for radiation shielding and protection from external hazards, while canister-based designs use concrete for shielding and protection from hazards. Concrete is a common material for this function and is widely used in the nuclear industry. The concrete containment domes at Prairie Island are an example of shielding and protection from external hazards.

j. From a temperate zone standard (e.g., South Carolina v. Minnesota) how does the proposed spent fuel storage technology alternative and storage facilities hold up?

Response: The alternate designs to be considered all have been generally licensed for use by the NRC and can be used at any NRC licensed reactor site in the country. This means they have been evaluated for all temperature extremes in the US, from the cold of Minnesota to the heat of Arizona.

2. Is Xcel proposing to remove the spent fuel from the current TN-40 and TN-40HT cask and repack that spent fuel into a different and undefined substitute spent fuel technology?

Response: Xcel Energy is NOT proposing to repackage the fuel contained in the existing TN-40 cask.
Our request only relates to the last nine (9) TN-40 casks currently authorized, i.e., cask numbers 56 through 64. We are requesting permission to consider other cask designs to potentially use in place of the TN-40 casks for these last nine casks.

a. If Xcel is proposing to remove the spent fuel and re-cask it in a new spent fuel technology what will happen to the current TN-40 and TN-40HT casks and will they be disposed of off-site or will they remain in the ISFSI or elsewhere on the PINGP's property?

Response: As noted above, we are not proposing to remove any fuel from existing TN-40 casks.

i. If not disposed of off-site how long will the irradiated current casks remain on-site?
ii. What is the plan and timing for their final disposition?

b. Is Xcel proposing to continue using the currently packed TN-40 and TN-40HT casks and employ a different and undefined spent fuel technology for spent fuel coming out of the spent fuel pool in the future?

Response: See answer 1.a.

i. If so, what are the implications of such?

3. What is the industry's experience with the TN-40 and TN-40T cask?
a. Has the industry attempted to replace any component parts of a TN-40 or TN-40HT?

Response: Prairie Island is the only site to use the TN-40 model and has not replaced any cask components. There are similar models to the TN-40 (TN-32, TN-68) in use at other sites. We are aware of TN casks at two sites that were required to replace the metallic seals: one cask at the first site and five casks at the second site. The casks at those sites were transported to the plant auxiliary buildings and the seals were replaced successfully. The casks were then returned to the storage locations at these sites.

b. What issues arose?

Response: The above-described replacement of the cask lid seals was accomplished without any known issues at those sites.

c. Was the replacement of component parts successful?

Response: Yes

4. What is the industry's experience with re-casking spent nuclear fuel in general and more specifically with the TN-40 and TN-40T casks?

a. What is the industry's experience recasking spent nuclear fuel from one type of cask to another alternate type of cask?

Response: We are not aware of any industry experience with "recasking" of fuel from one cask to another alternate type of cask at a nuclear power plant. We are NOT asking to recask any fuel with this filing.

b. Has the industry attempted to recask a TN-40 or TN-40HT?

Response: No, not from one cask to a different cask. At one site during a seal replacement of a TN-68 cask, the fuel in the cask was removed for inspection. The fuel was then returned to the same cask for continued storage after the inspections were completed.

c. What issues arose?

Response: No issues. The fuel removal and return to the same cask was performed successfully.

d. Was the re-casking successful?

Response: See responses 4.a., b., and c.

5. How long is it anticipated that the storage will continue at PINGP's ISFSI? Spent fuel storage has existed for nearly 30 years already. This is halfway to the 60-year Waste Confidence Rule that the NRC has used as a guideline for the temporary storage and unfortunately there does not appear to be a viable off site storage alternative in sight yet.

Response: Xcel Energy continues to work with State and Federal officials to facilitate removal of fuel from Prairie Island and all other sites around the country at the earliest time possible.

The reference to the Waste Confidence Rule is somewhat out of date. The NRC has generically determined that the environmental impacts of continued storage of spent nuclear fuel in NUREG–2157, "Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel." This study analyzes potential environmental impacts over three possible timeframes: a short-term timeframe, which includes 60 years of continued storage after the end of a reactor's licensed life for operation; an additional 100-year timeframe (60 years plus 100 years) to address the potential for delay in repository availability; and a third, indefinite timeframe to address the possibility that a repository never becomes available.

6. Have the proposed new spent fuel storage technologies been approved for acceptance and final disposition by the US Department of Energy ("DOE")?

Response: At this point the DOE has not made a determination on the acceptability of any cask or canister design for final disposal, as these designs have an NRC license for transportation. The designs would be acceptable to transport the fuel to a DOE repository site. Depending on the final repository design, the DOE may or may not repackage the fuel into different containers.

7. Have the new technologies been approved for transportation to long-term/permanent storage?
a. If not, what is the transfer process to an approved canister?

Response: The designs we select will all have been Certified by the NRC for transportation. This would include transportation to a long-term storage facility, interim storage facility or a repository.

8. What is the impact of the new technology on the utility personal property tax revenue that is received by the County, City and local school district?

Response: While we expect different cask designs would be less expensive, substitution of the last 9 TN-40 casks with a different design would have minimal to no impact on the overall site valuation.

9. If the new technology creates a departure from the life expectancy and robustness of the current casks how will this impact our current emergency response plans?

a. What additional burdens would this place on the City as the primary responder to any incident at the ISFISI or the PINGP?

Response: The new casks have similar life expectancies and robustness and will have no impact on emergency planning.

10. In the event that the PINGP ceases operations, how is the emergency response going to be impacted by reduction in property tax revenues that support the City's emergency response services?

Response: This cask design filing and Supplemental EIS is not related to the above question.

11. What is the impact of the social justice implications of the continued and new storage casks on the City and the Prairie Island Indian Community and the other stakeholders?

Response: The different cask design would have no impact to off-site stakeholders when compared to the current design.

12. The SEIS, in addition to considering and evaluating the PINGP site-specific EIS, should also include an analysis of and incorporate parts of the Generic EIS (completed by the NRC regarding temporary spent fuel storage in general) as well as the Yucca Mountain EIS (completed by the DOE. This is important as these documents pertain to and build off one another.

Response: The NRC Generic EIS for continued storage is useful as a model to the extent it is independent of any specific cask design. The environmental impacts are similar for all cask designs and the NRC EIS uses this fact to make their determinations.

13. The incorporation of the Generic EIS and the Yucca Mountain EIS should specifically address the other considerations and recommendations regarding cask selection (including but not limited to Part 72).

Response: As noted in Response 12, the NRC Generic EIS for continued storage provides insights to the extent it does not rely on a specific cask design. The Yucca Mountain EIS is for permanent underground disposal and is unlikely to have much in common with the SEIS for Prairie Island.