The following questions were prepared by the Diablo Canyon Decommissioning Engagement Panel (DCDEP) for discussion the May 25, 2022 DCDEP public meeting. The questions were compiled from public testimony received at the April 20, 2022 DCDEP public meeting, questions submitted by individual Panel members and additional comments received by the DCDEP from the public. Representatives from PG&E and Orano TN will address these questions at the DCDEP public meeting on May 25, 2022.

For more information on the May 25,2022 public DCDEP meeting go to DiabloCanyonPanel.org.

QUESTIONS FOR ORANO TN

1. For what period is the spent fuel dangerous to the environment? Specifically, exactly how long does it take to become fully inert? (1,000 years, 10,000 years, 100,000 years?)

2. Are the casks designed to allow the contents to be transferable should the casks fail? Is there a removable lid?

3. How thick is the stainless-steel canister? Can you justify why a thick ductile cast iron cask is inferior to the NUHOMS design?

4. What demonstration project shows that it is safe to put higher heat loads into casks?

5. What changes in materials and manufacturing techniques ("internal changes") make the new Orano canisters capable of accepting such high temperature loads? By what mechanism?

6. How is the 4.2 kW heat load determined to be the safe threshold? What is the margin of error?

7. What is the worst thing that could happen if the heat exceeds 50kW? Specifically, what problems? If a cask were to reach a critical overheated temperature, what procedures are, or would be in place to cool the cask? Can the cask be put underwater? Can it have more air run across its surface? Can the cask be opened and its contents transferred? Has this ever been done, and by whom?

8. If Orano considers DCPP as "high-profile" project because it represents a technical first: setting a world record for moving a larger than usual backlog of spent fuel assemblies, that statement alone seems to indicate increased risk, testing new processes and procedures within narrow tolerances. It seems impossible that such a challenge doesn't pose increased risk of potential overheating of the material, and it inherently increases

the "tolerances" and "margins of error". How is this not the case? What are the known parameters that allow safe storage of hotter material?

9. What EXACTLY happens if a cask assembly starts spontaneously overheating?

10. Are there any scenarios in which overheating material can cause a chain reaction? If so, at what temperature or total assembly kW does this occur?

11. Is this even the right metric if a subassembly within the cask could overheat? Is risk not better assessed by considering the possibility of a "hot" subassembly affecting surrounding cooler assemblies?

12. If water gets inside a canister, will it cause a chain reaction?

13. Tom Jones has stated that there is a 50% or more margin of error on the heat generation thresholds of the radioactive material. However, the total heat load has been stated to be 50kW per cask and the load temperature recommendation was around 40kW. How is the 50% margin of error or tolerance calculated or modeled?

14. What is the worst-case scenario of what could happen if the cask exceeds 50kW?

15. What is the highest off-load Orano has ever done?

16. How do you retrieve a fuel canister in case of failure?

17. Has Orano ever removed a canister once it is in place?

18. In the case of a canister failure, do you plan to put the canister in an overpack, and has that been approved by the NRC?

19. Realizing that cooler assemblies adjacent to hotter assemblies can help stabilize temperatures across the casks, and this is a critical aspect of design and the calculated risk, what cross-checks would be in place to assure that the load pattern of these subassemblies is not performed incorrectly? There are 19 casks that were incorrectly loaded by Holtec. What procedures will be put in place to assure that no such errors occur again? What are the engineering failure modes if several additional hot assemblies are added to a particular cask?

20. How did you prove Orano's casks to be seismically qualified for Diablo Canyon?

21. Will you have to modify the existing ISFSI to create a flat surface? If so, how will you do it? Will you remove the 7-ft. long anchors from the concrete? If so, how do you fill the holes so that the concrete slab is as strong as it was originally?

22. Why aren't you anchoring the casks to the concrete?

23. You said that there were no rust issues with your casks at SONGS: will we not see any rust issues on your canisters at DCNPP? When did you inspect the canisters at SONGS, and will you evaluate anything related to corrosion of stainless-steel canisters?

24. Orano stated that consideration of embedded carbon particles in the canisters is not of concern. But there is carbon-induced stress corrosion cracking – how do you prevent gouging, scratching, etc. from embedding carbon particles in the stainless steel, and how do you check for it?

25. Will sliding the canister into the cask cause scoring of the stainless steel? How do you know?

26. Has your repair technology been evaluated and approved by the NRC or ASME?

27. What is the method used for fuel inspection to determine if there is damage?

28. How long will a new Orano transport mechanism last if it is stored at DCPP in a marine environment? Will it last as long as the expected life of the casks? If not, what provisions can be made to provide means to replace the transport mechanism for a future generation of citizens facing failure of the cask enclosures 500 years in the future? (This may seem like a highly theoretical question, but that is a reality of the radioactive half-life of the spent fuel.)

29. What is the expected life of the onboard electronics of any transport device especially given the marine climate at DCPP? Should these mechanisms be kept in controlled environments?

30. If PG&E employees are overseeing the operation, do they get training at your facility in South Carolina? If so, how extensive?

31. What are the engineering failure modes of the casks? Corrosion, cracking of concrete and stainless-steel assemblies? Coefficient of expansion? Other stressors? Anything else? Given the thickness of the stainless-steel canisters, what is the expected life in a high-salt marine environment?

32. What is the status of the permit applications for consolidated interim storage in Texas or elsewhere?

QUESTIONS FOR PG&E

1. Why risk accelerating the schedule of off-loading fuel from the spent fuel pools over doing it more slowly? What is the cost trade-off for taking more time?

2. What is the term of PG&E's financial responsibility for the ISFSI? Does this include responsibility for both maintenance of the casks, monitoring, and transfer to a new cask if for any reason the cask fails?

3. If the term of PG&E's financial responsibility is less than the period during which the radioactive waste poses a danger to the surrounding communities and ecosystems, what is the rationale for that limited responsibility?

4. What is the anticipated life of both the Holtec and Orano cask systems?

5. Do you anticipate any issues with the license amendment to allow 4.2 kW and 50 kW respectively at Diablo Canyon? Will the license amendment capture all the changes?

6. Is the projected life of the cask significantly increased by relocation away from the marine environment at DCNPP? This question applies to both Holtec and Orano designs.

7. If there is a difference in anticipated life, would transport of the more vulnerable cask system be prioritized?

8. Can the DCISC, the CEC and the UCLA Independent Risk Assessment Program evaluate the new system and give feedback to the Panel and the community?

9. Has the overall heat load of 50kW ever been allowed at Diablo Canyon? If not, where is it allowed, and at which sites has it been done?

10. What are the hottest assemblies that have been placed into the current canisters? What is the overall heat load that's licensed for the current system?

11. Will outlet air vent radiation readings occur at the ISFSI?

12. What is the risk of a landslide occurring on the mountain behind the SNF storage pads and blocking the vent ducts?

13. Would a reinforced structure or berms be helpful to protect against terrorist attack?

14. Related to ISFSI surveillance for protection from attack, what is the level of illumination at night?

15. Are there any models of a realistic worst-case scenario earthquake? What is safer – spent fuel pools or dry storage?

16. Would containment, whether at the ISFSI or elsewhere on site, better protect existing dry casks and canisters from sea air degradation and corrosion? Should an independent study be conducted to address this issue?

17. The County may finish the decommissioning land use permit before the NRC licensing is complete. What will be available to the County for their safety findings?

18. We need a better explanation of the comparative risks of keeping the spent fuel in the pools compared with getting it out earlier into dry storage. Is dry cask storage much safer than pool storage, even for fuels of equal heat content?

19. What do you plan to do with the water from the spent fuel pools when decommissioning?

20. There are several possibilities for causing cracks in canisters: chloride salts and carbon embedment are two of them. What are the others?

21. In 2014, EPRI discovered conditions to promote chloride-induced corrosion on a canister that was 2 years old at Diablo Canyon. https://www.nrc.gov/docs/ML1405/ML14052A430.pdf Has this particular canister been re-inspected in the past 8 years? If so, what were the findings? If not, why not?

22. If the casks are only designed to last ___ years (100?, 200?, 500?, 1000?), is it not inherently safer for local communities to move the casks as soon as it is safe to do so?

23. What is the difference in expected cask service life between the DCPP marine environment and the proposed location in Texas for Consolidated Interim Storage Facility?

24. If for any reason opposition to relocation of spent fuel to the Consolidated Interim Storage Facility is opposed by local communities or stayed by regulatory or legal action, does that prevent relocation of the casks decades or centuries later if the casks are

found to be less durable than originally intended? In other words, if Mothers for Peace or another agency won a suit to halt transport, would PGE and other agencies such as regulators see that as a permanent decision? If the casks were later found to be failing, what mitigation measures could be implemented to prevent damage to the environment and surrounding communities?

25. If cask failure were to occur in 500 years, what agencies would be around to mitigate the crisis? One would presume that the answer to this question is that "no one can see that far into the future". If there is no longer an organized society, regulatory agencies, or support infrastructure, such as an Orano cask manufacturer to build a new transport device and new casks, how would the succession of future generations have any assurance that the casks are safe if they are left in the current corrosive environment?

26. Does a concrete or metal enclosure over the ISFSI mitigate significantly against such failure modes or lengthen the projected life of the casks?

27. What is the cost of such a concrete enclosure compared to the cost of transport of the casks to the Consolidated Interim Storage Facility in Texas?

28. It has been stated that the current Holtec transport mechanism is not working well or is in disrepair. Is it prudent to leave it in disrepair? Is it not needed to transfer materials in the event of transport to a different site in 50 years? Should there not be a program to maintain such hardware for such eventualities?

29. If such a location is licensed prior to a permanent storage facility, is it reasonable to assume that the spent fuel that has been longest stored at the ISFSI is the least dangerous to move first?

30. How long should "hot fuel" be cooled in the ISFSI prior to safely moving to an interim storage facility such as the proposed Texas facility?

31. Will Comprehensive Decommissioning International (CDI), which is jointly owned by Holtec International and SNC-Lavalin, or Holtec Decommissioning International (HDI), be allowed to bid on future work for Diablo Canyon?

32. Will the new Orano system take up less space on the pad, and if so, how much space will be available after the last offload of irradiated spent fuel? Would there be enough space to accommodate the spent fuel if operation of the plant were extended?

33. **Questions about the last presentation on Orano off-site storage [and in light of Newsom]:**
    Orano stated they have a repository. Texas appears to be contesting the specific higher level radiation storage locations mentioned as the receiver of future relocations: https://www.power-eng.com/nuclear/waste-management-decommissioning/texas-governor-joins-legal-fight-against-2-3-billion-spent-nuclear-fuel-storage-site/#gref
    Similar disputing of Holtec storage site in New Mexico:
    https://www.heinrich.senate.gov/press-releases/members-of-nm-congressional-delegation-governor-send-letter-to-energy-secretary-opposing-holtec-nuclear-waste-interim-storage-site-in-new-mexico-

    Questions concerning the exterior concrete cask receivers/holders/sleeves:
34. As concrete is a chemical process involving water, is there a concern for higher temperatures in the concrete holders/sleeves in conjunction with moisture accumulation in concrete from absorption of sea air? These are simple spalling/exploding concrete videos- not meant to scare, but inform of physics. I am sure there are concrete mixes and admixtures developed for the core and other very high heat locations that have solved these issues long ago, and I don't propose that the cask temperatures get to these ranges at the concrete surfaces.
    https://www.youtube.com/watch?v=NxJPX0lssIQ
    https://www.youtube.com/watch?v=xbFzMnSBp1o
35. The higher heat noted in the casks and variability in temperatures at transfer suggests the concrete containment 'holders' do have potential temperature issues between 200 degrees F and 400 degrees F with possible significant impacts if temperatures go over 400 degrees F. As the theoretical mix may solve the heat issues, what is the quality control for the concrete as it is cast for the cask holders to assure each concrete cask is made of the right mix? Are there samples from each cask mix produced and retained for tests?
    https://www.concreteconstruction.net/how-to/effect-of-high-temperatures-on-concrete_o
    https://www.concreteconstruction.net/how-to/changes-in-concrete-at-high-temperatures_o

36. But what about the aged, in-place nature of this location and possible longer-term extension of onsite storage as sea air is exposed to the concrete sleeve/holder surface? Intuitively, some would evaporate, but some may also be driven into the concrete by it being cooler, and toward the reinforcing. Is the rebar specially treated with corrosion protection?

37. Have the higher heat impacts, sea air moisture effects over time, and seismic capacity been reviewed or tested as concurrent impacts on the concrete holder/sleeves?

38. If sea air is a possible issue, is the heat dissipation capacity of the Orano system impacted by being inside a larger enclosure? If so, would that enclosure need a certain amount of fresh filtered air to ensure heat dissipation?

Questions concerning the existing storage pad:

39. How does the existing concrete storage pad that was designed for point load cask weight supports rationalized for the higher weight distributed loads of the new cask system?
40. How is the concrete pad reinforcing verified for possible corrosion of reinforcing?

41. Have any repairs been made to spalled concrete in the existing storage area pad over the life of the plant?

42. If the existing point-based steel locations are modified to allow a 'flat' slab for the new casks, how does the slab get protected from the steel reinforcing being exposed? Is the steel taken to a certain depth below the top of slab and slab repaired?