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To: Carol Gallagher (via email to Carol.Gallagher@nrc.gov)

From: Sandra Birk/INL

Date: February 4, 2013

Subject: Responses to NRC Request for Comment, Docket ID NRC-2013-004

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This document includes three sets of comments on Docket ID NRC-2013-004. They represent three separate points of view expressed by staff here at the INL.

Thank you for this opportunity to share our perspectives on this important issue. Please don't hesitate to call if additional questions regarding my responses or if clarification is needed.

Respectfully,

Sandra Birk 208 526-1866

1/17/2013
78 FR 3853

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Opening Remarks

The providers of these stakeholder comments appreciate the efforts that the U.S. Nuclear Regulatory Commission (NRC) has extended in issuing the request for comments on the topics of retrievability, cladding integrity, and safe handling of spent fuel at an independent spent fuel storage installation and during transportation.

Perhaps the single most important issue for the NRC to consider throughout all of their upcoming deliberations would be to avoid issuing regulations or establishing interpretations or policies that assume a specific set of future events will occur. An appropriate example was the assumption that low burnup spent fuel could be placed into wet or dry storage for a relatively short time prior to the opening of a repository, during which the structural integrity of the spent fuel could be assured provided certain protection practices were instituted. Now consider the current status of spent fuel today. Faced with fuels having higher and higher burnup rates, much longer storage times than originally anticipated (and still undefined), and with loadings imposed from two intermediate transportation efforts (to an interim storage site and eventually the final disposition location), how can one assure retrievability of each and every fuel assembly using normal means? This almost mandates repackaging, potentially more than once, or regularly scheduled visual inspections. In reality, considering increased generated waste, higher costs, and additional radiation dose to personnel, both visual inspections and repackaging¹ should be avoided if possible. The primary focus of regulations should be the establishment of the necessary safety requirements (e.g., criticality prevention, shielding for personnel safety, contamination prevention, etc.), not the prediction of future events. Assuming the occurrence of specific future events hampers the consideration of engineered

¹ Complying with final disposition (disposal or reprocessing) requirements may be the only viable reason for repackaging.

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alternatives or other options because the assumed occurrence of these future events dictates that there is no need for alternatives. Yet it is these engineered alternatives or other options, which can satisfy the required safety needs, that often yield the most effective solutions to difficult scenarios.

For example, if the structural integrity of fuel assemblies, baskets, or poisons inside of a storage canister cannot be adequately demonstrated for transportation, employing the use of another structurally adequate container (such as an intact storage canister or a separate and reusable inner containment for transportation) can provide an alternate way to safely handle and transport the fuel assemblies and still prevent criticality concerns (via moderator exclusion) as well as providing another barrier (effectively replacing the cladding) against the release of radioactive material. One engineered alternative can achieve these multiple safety requirements.

It is also important for regulations to avoid making references to past practices or processes as being a given for the future. Currently, spent fuel is being placed into storage canisters for dry storage. In the future, that is likely to continue, at least for a while. But what if an interim storage facility is opened and the desire is to immediately accept bare fuel elements? Suddenly, regulations or policies focused on dealing with a storage canister will not be applicable for this circumstance. It would appear that the best approach is to focus on the basic safety requirements and not on specific components. Let the engineers develop the most appropriate approach that can satisfy the necessary safety requirements for the circumstances present.

Response to NRC Request for Comments

Docket ID NRC-2013-004

Comments (crosscut and are referred within responses to the specific questions)

1. The background provided by the NRC and the nature of the subsequent questions for comment appear to equate moving to a regulatory framework that allows canister-based retrievability with 'allowing' fuel degradation. This need not be the case.

Two key questions that should be considered are:

- Will a regulatory framework that allows canister-based retrievability necessarily result in a higher likelihood of degraded fuel?
- Can a regulatory framework that requires individual fuel assembly retrievability preclude fuel degradation?

The answer to both questions is 'not necessarily'. Canister-based retrievability could be implemented without relaxing standards associated with maintaining fuel integrity. And, requiring retrievability at the level of individual fuel assemblies, by itself, does nothing to either preclude or limit degradation. It requires only that fuel assemblies be individually canned if the absence of degradation cannot be demonstrated, a mitigative strategy that could be needlessly costly not only in dollars but also in terms of radiation exposure and waste generation.

Hence, considerations related to maintaining fuel integrity and allowing canister-based retrievability should be evaluated independently.

2. Many of the questions explicitly ask whether Regulatory framework should assume future conditions or capabilities. Ideally, regulations should be limited to prescribing requirements that ensure a satisfactory level of safety. To the extent this is achieved, the regulatory framework becomes independent of assumptions and the need for speculation is avoided.
3. The drivers for maintaining fuel integrity are largely related not to safety but to the desire for maintaining flexibility with respect to future SF management. Thus, spent fuel integrity considerations are primarily related to SF financial and policy considerations related to SF management. The NRC's role in this regard is not clear.

Sound management and stewardship dictates that decisions consider the impact to the overall life cycle risks and costs. However, the fragmented responsibility for the fuel cycle; the lack of a clear and executable policy; and the lack of a single, accountable organization for implementing the policy incline the NRC to fill the void in order to achieve its mission of ensuring safety.

4. Although both the industry and the regulator are reluctant to admit it, the storage period for spent fuel and associated high level waste is indefinite (i.e. cannot be defined with a high degree of certainty). And this will remain true at least until the capacity exists for its disposal at a rate that exceeds its generation. There are no credible projections that show this occurring in the foreseeable future.

This consideration is relevant to the NRC's questions because it places any regulatory framework based on a prediction about the length of the SF storage period on questionable ground. Fuel will eventually degrade whether the regulatory framework allows it or not. Hence, a regulatory approach that acknowledges this reality and provides an effective framework for assuring safety regardless of what the future holds will be more robust, more credible, and more exemplary. Waste confidence would be significantly enhanced by a regulatory framework that does not depend upon unverifiable predictions about the length of the storage period.

Safety can be assured without reliance on fuel integrity and without retrievability at the individual fuel assembly level. This does not mean that it is wise to intentionally allow degradation. But it does mean that it is prudent to develop a regulatory framework that allows effective approaches for addressing this possibility.

Responses to Specific Questions and Associated Comments

A. Acceptance of Spent Fuel by a Future Disposal or Reprocessing Facility

1. *Should an enhanced regulatory framework assume the licensee receiving spent fuel for disposal will be able to site and design a repository for direct disposal of these high-capacity canisters without repackaging?*

No. See General Comments 2 and 3.

2. *Should an enhanced regulatory framework assume the repository licensee will be able to handle and repackage potentially degraded/damaged fuel on large production scales?*

No. See General Comments 2 and 3.

3. *What effects, if any, would a canister-based retrievability policy have on a future reprocessing facility?*

There would be very few, if any. SF integrity need not be different than with an assembly-based retrievability policy (see General Comment 1). The only foreseeable effect may be a result of having to open and dispose of a higher integrity SF canister. The net cost of this for the reprocessing facility is unlikely to be significant.

Alternatively, a framework that requires assembly-based retrievability could force canning of individual fuel assemblies that would otherwise be unnecessary. Opening and disposing of a much larger number of canisters at a reprocessing facility could affect costs.

4. *What other factors, such as cost, dose, or time, should be considered?*

Degradation concerns, decay heat, technology options, and societal values may all change with time. Hence, there is programmatic risk associated with basing any regulation on assumptions about the future. See General Comment 2 above.

B. Spent Fuel Retrievability During Storage

The NRC would like external stakeholders to provide an assessment of (1) whether ready-retrieval of individual spent fuel assemblies during storage should be maintained, or (2) whether retrievability should be canister-based.

Unlike cladding that is designed primarily based on operating considerations, a canister can be designed and tested specifically to ensure safety during storage and transport. Also unlike cladding, a canister can readily be inspected and, if needed, repaired and/or replaced. These considerations lean strongly toward basing primary safety arguments on canister rather than cladding integrity. This position however should not be construed to advocate allowing cladding to degrade. There remain strong incentives for maintaining measures to preserve cladding integrity. See General Comments 1 and 3.

Given that degradation can never be entirely prevented and that the length of storage cannot be precisely determined, it is prudent to provide a regulatory framework that allows the safety basis to be readily evaluated, upgraded if/as needed, and renewed for as long as may be necessary – without the need to know apriori how long that may be. See general comment 4.

C. Cladding Integrity

- 1. Should the spent fuel cladding continue to be protected from degradation that leads to gross rupture, or otherwise confine the spent fuel, during storage such that it will not pose operational safety problems with respect to its removal from storage? In particular, provide any explanatory information discussing the additional cost, dose, and effort required to repackage potentially damaged fuel over canned spent fuel, if the prohibition against gross deformation to the cladding were removed and the spent fuel required repackaging (whether by DOE or storage licensees).*

Certainly spent fuel should be confined to ensure that it does not pose operational safety problems. And both cladding and canister can play a role. See General Comments 1 thru 4.

- 2. Should each high burnup spent fuel assembly be canned to ensure individual fuel assembly retrievability? Additionally, should spent fuel assemblies classified as damaged prior to loading continue to be individually canned prior to placement in a storage cask? In particular, NRC is interested in gathering input on the additional cost, dose, and effort required to place individual fuel assemblies in a damaged fuel can during storage cask loading. Comparison of the upfront cost, dose, and effort to can all high burnup fuel assemblies against the cost, dose, and effort to repackage potentially damaged fuel at a repository or prior to transport to a repository, may factor into NRC's retrievability policy decision making process.*

The costs (dollars, exposure, and rad waste) of this approach would be extremely difficult to justify. This is because 1) it is unlikely that a future of a reprocessing or disposal schemes would require handling the contents of specific individual fuel assemblies. And 2) processes could be designed if

needed to handle and/or repackage degraded fuels using present technologies. See General Comments 1 thru 4.

D. Transport Retrievability

1. *The NRC would like external stakeholders to comment on (a) whether retrievability should be extended to transportation packages after normal conditions of transportation (similar to the storage requirements), or (b) is it acceptable for high burnup spent fuel to degrade such that damaged fuel may have to be handled when the package is opened? Extending retrievability to transportation may be important if the U.S. were to move to consolidated interim storage, and if the NRC were to maintain its current definition of assembly-based retrievability during storage.*

Yes -- to the extent that retrievability is necessary to ensure safety requirements are satisfied and to implement policy requirements, it should be required following NCT. The difficulty however in assuring retrievability following transport that may occur one or more times and may occur far into the future, is a reason to avoid basing it on an component that cannot be inspected. Further, if integrity is compromised or cannot be demonstrated, the mitigation strategy is to can it and thereafter credit the canister for retrievability. The only question being debated seems to be whether the canister capacity must be limited to a single assembly (i.e. to ensure retrievability at the assembly level). As noted above, it is unclear what safety purpose this would serve while it is very clear that it would increase costs, exposure, and radioactive waste. See General Comments 1 thru 4.

2. *If it is acceptable for the fuel to degrade, should the package application for a certificate of compliance provide a description of the design and operations of any facilities and methods necessary to handle the damaged fuel (at the facility that will open the package)?*

Measures should be taken to minimize degradation. But fuel will degrade despite our best efforts. And, given the uncertainties associated with extending storage, fuel degradation that prevents handling by normal means cannot be precluded. It is reasonable and prudent to expect a licensee to provide assurance that package contents can be safely handled if degraded and the package must be opened. It is not reasonable to expect a licensee to describe design and operations of future facilities. See General Comments 1 thru 4.

Comment Set 2

A. Acceptance of Spent Fuel by a Future Disposal or Reprocessing Facility

1. *Should an enhanced regulatory framework assume the licensee receiving spent fuel for disposal will be able to site and design a repository for direct disposal of these high-capacity canisters without repackaging?*

No Adapting a no-repackaging policy would be in direct conflict with the performance-based intent of 10CFR63 and represent back-tracking towards the prescriptive requirements of 10CFR60. Had Yucca Mountain opened, the neutron absorbers in today's dual purpose canisters (DPCs) would have required repackaging. The analysis performed by EPRI on the disposability of the DPCs without repackaging was unsupported by any corrosion data on neutron absorber degradation. NRC's role as an independent regulator should continue to be development of performance-based regulations protective of public health and worker safety. Moving in the direction of design solutions to today's problems by specifying that current DPCs be disposable is a dangerous precedent. That doesn't mean that licensee receiving spent fuel for disposal should not attempt direct disposal of DPCs, but success should not be an implicit presumption.

2. *Should an enhanced regulatory framework assume the repository licensee will be able to handle and repackage potentially degraded/damaged fuel on large production scales?*

Yes In fact, both interim storage and disposal facilities receiving spent fuel from multiple sites must have the ability to open DPCs and/or repackage as necessary. Had Private Fuel Storage (PFS) opened as licensed, the facility would have had no ability to reopen or repackage the 4000 DPCs it was authorized to receive if needed for offsite transportation. Yucca Mountain had planned to repackage all fuel received in DPCs. Given the uncertainty regarding the availability of disposal, any licensee receiving spent fuel from multiple sites must have both the physical infrastructure and financial backing to store fuel indefinitely without reliance on annual congressional appropriations. This approach has been taken in the Netherlands for interim storage as a means to increase public confidence that interim storage will be safe.

3. *What effects, if any, would a canister-based retrievability policy have on a future reprocessing facility?*

Even though a canister-based retrievability policy does not automatically result in fuel degradation, very long storage periods may lead to this outcome. Thus a canister-based retrievability policy would likely increase cost and wastes associated with front-end handling of the spent fuel loaded DPCs by assuming that the facility design must accommodate DPCs with fully intact to fully degraded fuel, opening the DPCs at the reprocessing facility becomes a complex operation in contrast to handling intact fuel assemblies. One would also expect LLW and TRU waste volumes to rise dramatically simply due to the GAP inventory likely being captured on pool cleanup resins. Yucca Mountain had examined the issue of opening sealed

canisters (with intact fuel) and concluded that opening these DPCs underwater was the best way to address loose contamination control.

4. *What other factors, such as cost, dose or time, should be considered?*

- A. **LOSS OF ABILITY TO TRANSPORT:** With few exceptions all fuel in storage can be transported under current regulations without repackaging. No utility has reopened a welded dry canister and there is no infrastructure to perform this at the stranded plants. Thus a policy for moving the dry casks before losing the ability to transport under current regulations should be established. Transporting under current regulations while very conservative instills much higher trust with the public. Giving up geometry control during transportation, consideration of moderator exclusion, and essentially removing one barrier (cladding) collectively sends out the wrong message.
- B. **INSTITUTIONAL CONTROLS:** Extended storage over periods of several hundred years assuming a fixed regulatory environment and stable ownership is problematic. Predicting the future is difficult but if future energy sources are vastly different from today's it is not inconceivable to assume that spent fuel storage sites could become isolated LLCs leading to eventually abandonment. The corporations/lawyers that created superfund sites have figured out how to do this. Thus a policy for moving the dry casks before institutional controls are lost at the storage installations should be established.
- C. **EXTENDED STORAGE:** There are no technical issues to prevent indefinite safe storage of SNF. States or any other entity considering receipt of a centralized interim storage facility should recognize that the largest risk is getting access to adequate funding to repackage the fuel if needed and maintain the overall storage infrastructure. All of the current concerns of cladding integrity and other degradation can easily be addressed by simply repackaging the SNF if required. This can only work if the SNF is centralized; performing repackaging in today's decentralized storage environment is cost prohibitive. If centralized, building the infrastructure to support indefinite storage becomes manageable. Regarding funding, the host site/state must have direct control over funds sufficient to monitor and repackage all fuel if needed. These funds must not be subject to annual appropriations. While not related to retrievability, the reporting relationship of any organization managing an extended storage facility should be isolated from whoever assumes responsibility for the ultimate disposition of the spent fuel. The public deserves a NRC licensed interim storage facility with a secure source of funding.
- D. **Dose:** Any attempt by the NRC to control dose through imposition of a design solution should be resisted. If we had dose standards in place today for

loading DPCs the industry might have built more fuel pools instead of dry cask systems. The NRC should not attempt to solve the broader system problem; this currently is the responsibility of the DOE.

B. Spent Fuel Retrievability During Storage

The NRC would like external stakeholders to provide an assessment of

1. *whether ready-retrieval of individual spent fuel assemblies during storage should be maintained, or*

The existing regulatory environment assuming retrievability and geometry control during transportation should be maintained until the fuel is moved to a centralized interim storage or disposal facility.

2. *whether retrievability should be canister-based.*

Canister-based retrievability should only be implemented after the fuel is moved to a facility that has the capability to open a canister with degraded fuel inside.

C. Cladding Integrity

1. *Should the spent fuel cladding continue to be protected from degradation that leads to gross rupture, or otherwise confine the spent fuel, during storage such that it will not pose operational safety problems with respect to its removal from storage? In particular, provide any explanatory information discussing the additional cost, dose, and effort required to repackage potentially damaged fuel over canned spent fuel, if the prohibition against gross deformation to the cladding were removed and the spent fuel required repackaging (whether by DOE or storage licensees).*

See 4.A above.

2. *Should each high burnup spent fuel assembly be canned to ensure individual fuel assembly retrievability? Additionally, should spent fuel assemblies classified as damaged prior to loading continue to be individually canned prior to placement in a storage cask? In particular, NRC is interested in gathering input on the additional cost, dose, and effort required to place individual fuel assemblies in a damaged fuel can during storage cask loading. Comparison of the upfront cost, dose, and effort to can all high burnup fuel assemblies against the cost, dose, and effort to repackage potentially damaged fuel at a repository or prior to transport to a repository, may factor into NRC's retrievability policy decisionmaking process.*

The notion that today's DPCs will be disposable should be discarded. History has shown that had the 1995 vintage multi-purpose canister been used for packaging they would not have been disposable in Yucca. Deep boreholes would require smaller packages. Today's large DPCs would be an engineering challenge to dispose in a salt repository.

High burnup cladding data should be quickly acquired using the same techniques used for the low burnup cladding. While some modeling may be appropriate, the underlying preponderance of data must be derived from inspection. Damaged fuel should be canned in damaged fuel cans using current storage and transport regulations. Again, this will demonstrate the highest level of confidence to the public. The dose associated with repackaging at either a centralized storage or disposal facility should not be assumed to be equivalent to the packaging done at reactor sites. Once the spent fuel is centralized, opportunities for automation such as fully remote canister welding (as done for the Yucca Mountain waste package) make dose comparisons to today's packaging techniques moot. The cost to repackage fuel at a repository should not enter into discussions of how to store the fuel today. Again, this is a moot topic since no one knows what the disposal configuration will be.

Comment Set 3

The following comments are provided following the same format used in the NRC's request.

A. Acceptance of Spent Fuel by a Future Disposal or Reprocessing Facility

At this time, the U.S. Department of Energy (DOE) is moving forward with research and development, investigative studies, and potential conceptual designs of facilities needed to complete the spent fuel cycle. However, the specifics associated with timing, quantities, equipment, interim storage requirements, final disposition requirements, etc. are still being developed. Final plans for interim storage and final disposition would be very helpful in supporting the NRC's deliberations but much work is still needed before that determination can be made. However, there is a clear need for DOE and the NRC to continue working together.

1. Should an enhanced regulatory framework assume the licensee receiving spent fuel for disposal will be able to site and design a repository for direct disposal of these high-capacity canisters without repackaging?

No. The past has demonstrated the problem with assuming certain future events. For the sake of reducing unnecessary waste, minimizing costs, and reducing radiation exposure to personnel, one can hope that a future repository can effectively incorporate current storage canisters into its disposal plans. However, an enhanced regulatory framework should also plan on the potential need for repackaging, at either the interim storage facility or at the repository.

2. Should an enhanced regulatory framework assume the repository licensee will be able to handle and repackage potentially degraded/damaged fuel on large production scales?

An enhanced regulatory framework should consider the possibility that the repository licensee will need to be able to handle degraded/damaged fuel. Such a repackaging capability is expected to be necessary at either an interim storage facility or a repository but it is difficult to say at which location at this time. Some thoughts are that the interim storage facility would most likely need an ability to mitigate just about any plausible accident scenario associated with handling spent fuel (either at initial receipt, during storage, or at the time of shipment to its final disposition) so having a mitigation capability at the interim storage facility makes sense. The other thought is that if any repackaging is necessary, it would be best performed safely at the interim storage facility so that it can be accomplished in a means that satisfies the final disposition requirements when established. An environmentally-controlled hot cell capable of handling and opening or closing large containers like storage canisters would be a very effective mitigation capability. One would also expect that after repackaging, it would be relatively easy to demonstrate that the spent fuel would be safe for transportation to the final disposition location.

3. What effects, if any, would a canister-based retrievability policy have on a future reprocessing facility?

Although reprocessing is not an expected final disposition at this time, such a facility, if built, would have to be constructed so that multiple capabilities existed to handle expected and unexpected situations that might arise during spent fuel

receipt. Again, an environmentally-controlled hot cell capable of handling and opening large containers like storage canisters would be very effective. However, if repackaging occurs at the interim storage facility, storage canisters may not even arrive at a reprocessing facility. Therefore, there is a need to determine what activities are best achieved at the interim storage facility. Then, the reprocessing facility can be designed. But reprocessing retrievability issues should be dealt with as part of the licensing requirements for the reprocessing facility. Regarding retrievability, the storage regulations need to maintain an ability to eventually load the spent fuel for transport while transportation regulations need to be able to safely unload after transport.

4. **What other factors, such as cost, dose or time, should be considered?**

Cost, time, and dose (the highest concern) should be considered in all of the stages necessary for completing the spent fuel cycle. However, final details may not be forthcoming in time to support the enhanced regulatory framework deliberations.

B. Spent Fuel Retrievability During Storage

The issue of retrievability should be viewed from the perspective of safely completing the spent fuel cycle, from the nuclear power plant to the final disposition facility, regardless of the time interval involved or intermediate stops along the way. If the interim storage facility or the final disposition facility can safely handle the spent fuel in ways other than lifting an individual spent fuel assembly from a container, then imposing such a specific requirement in storage or transportation regulations is simply unnecessary.

1. **Should regulations requiring the ready-retrieval of individual spent fuel assemblies during storage be maintained?**

No. As long as alternatives exist that satisfy the same safety requirements and permit the spent fuel to be eventually transported, this component specific regulation is unnecessary and potentially defeats other viable engineered alternatives.

2. **Should regulations requiring that retrievability be canister-based be adopted?**

This would be an improvement but there would still be some potential concerns. What if the final decision is to repackage all spent fuel at the repository and a future decommissioned plant wants to transport its last batch of undamaged spent fuel from its spent fuel pool directly to the repository? If the regulations required "canister-based retrievability", would the fuel need to be unnecessarily placed in a "canister", even though this spent fuel could be safely transported bare to the repository? Rather than using a very specific term like "canister-based", why not utilize a more general term or phrase that achieves the same objective?

C. Cladding Integrity

Again, the issue of cladding integrity should be viewed from the perspective of safely completing the spent fuel cycle, from the nuclear power plant to the final disposition facility, regardless of the time interval involved or intermediate stops along the way.

If the interim storage facility or the final disposition facility can safely handle the spent fuel in ways that do not require the cladding integrity to be intact or do not require non-degraded spent fuel, and it can still be safely transported from interim storage, then imposing such a specific component requirement in storage or transportation regulations is simply unnecessary.

1. **Should the spent fuel cladding continue to be protected from degradation that leads to gross rupture, or otherwise confine the spent fuel, during storage such that it will not pose operational safety problems with respect to its removal from storage?**

The better condition the fuel remains, the easier future handling of the fuel will be. Hence, current protection practices (drying, backfilling with helium, etc.) should be continued because they could prevent unwanted degradation. By eliminating current protection practices, future fuel handling activities could become even more complicated and more costly with increased exposure to personnel. But to have storage regulations that require the degradation of spent fuel be controlled to prevent gross degradation may not be achievable, even with the best protection practices employed, especially for the high burnup fuel during long-term storage followed by transportation. The focus of the safety requirements should consider the entire system approach being used with various options available, not just the fuel cladding or fuel assembly performance alone. The use of an environmentally-controlled hot cell at an interim storage facility can significantly reduce personnel exposure, much more than just the use of individual damaged fuel cans, when preparing damaged spent fuel for shipment. Overpacking might present another alternative. Full consideration of viable alternatives is paramount and can permit the deletion of specific component requirements that simply may not be achievable or may not be capable of being demonstrated to be effective.

2. **Should each high burnup spent fuel assembly be canned to ensure individual fuel assembly retrievability? Additionally, should spent fuel assemblies classified as damaged prior to loading continue to be individually canned prior to placement in a storage cask?**

No, canning individual fuel assemblies should not be an absolute mandate but it can be one alternative option. The individual canning of each high burnup fuel assembly at a power plant could be very costly, increase the waste stream, and significantly increase personnel exposures. Other engineered alternatives could provide the same safety needs without the associated detrimental consequences.

D. Transportation Retrievability

Clarification of this issue is probably warranted but the determination of final regulatory requirements should again consider focusing on the necessary safety requirements versus any anticipated future events, schedules, or facility designs.

1. **Should retrievability be extended to transportation packages after normal conditions of transportation (similar to storage requirements)? Or is it acceptable for high burnup spent fuel to degrade such that damaged fuel may have to be handled when the package is opened?**

Retrievability after normal conditions should not be extended to transportation packages. This is because of the possibility of added confusion due to the association of the phrase "retrievability" with the individual fuel assembly. However, if the potential of fuel degradation exists, having unloading requirements in place that allow the use of engineered alternatives (like a separate inner containment for transportation) is very appropriate. Regarding the acceptability of allowing fuel to degrade, one would expect the interim storage facility would have to prepare for such a possibility or the final disposition facility may or may not have to contend with it depending on what the interim storage facility eventually does with the fuel (e.g., repackage or leave as is in an intact storage canister). Again, the development of safety requirements that permit the use of various alternative solutions rather than requirements that focus on the behavior of specific components like the fuel assembly is an improved approach to regulation.

2. **If it is acceptable for the fuel to degrade, should the package application for a certificate of compliance provide a description of the design and operations of any facilities and methods necessary to handle the damaged fuel (at the facility that will open the package)?**

Yes, the package application should provide a description of the package design and unloading options. One should expect that the capabilities of the interim storage facility will be known prior to any shipment to that facility and eventually the capability of the final disposition facility will be known prior to shipping to that facility. But it may not be possible to address specific details of all of the facilities that will eventually open the package, especially if that facility has not yet be designed. As an example, engineered alternatives exist that could allow damaged spent fuel to be shipped to an interim storage facility. Clearly, the spent fuel needs to complete a future shipment to the final disposition facility in order to complete the spent fuel cycle. However, does the transportation package need to address that final leg of transport (to a repository or reprocessing facility) or just the first leg to the interim storage facility? Any needed limitations addressing this aspect could be clearly stated on the Certificate of Compliance.

Gallagher, Carol

From: Birk, Sandra M [sandra.birk@inl.gov]
Sent: Thursday, February 07, 2013 8:08 PM
To: Gallagher, Carol
Subject: comments on Docket ID NRC-2013-004
Attachments: NRC_Rulemaking_Solicitation comment 1.docx

Ms. Gallagher.

Please accept this attachment of three sets of comments to Docket ID NRC-2013-004

If you have any questions or require further clarification, please do not hesitate to call me.
Thank you

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