



W. R. McCollum, Jr.  
Vice President

**Duke Energy**

Oconee Nuclear Station  
7800 Rochester Highway  
Seneca, SC 29672  
(864) 885-3107 OFFICE  
(864) 885-3564 FAX

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U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Attn: Mr. E. William Brach, Director - Spent Fuel  
Project Office  
Office of Nuclear Material Safety  
U.S. Nuclear Regulatory Commission  
Mail Stop 06-F18  
Washington, DC 20555

Subject: Oconee Nuclear Site  
Docket Nos. 72-40, 50-269, 50-270, 50-287  
Request for Exemption to Permit Storage of Fuel  
Assemblies in Standardized NUHOMS®-24P Canisters  
Licensed Under Amendment 2 of the Certificate of  
Compliance (Docket No. 72-1004)

Pursuant to 10CFR72.7, Duke Energy Corporation ("Duke")  
herein requests an exemption from the requirements of 10  
CFR §72.212(a)(2) and 10 CFR §72.214 to permit storage of  
Babcock & Wilcox 15x15 spent nuclear fuel assemblies with a  
"nominal" fuel assembly width of 8.536 inches in  
Standardized NUHOMS®-24P Dry Shielded Canisters ("DSCs") at  
the Oconee Nuclear Site ("Oconee").

In sum, this exemption request is necessitated by Duke's  
imminent need to reduce the inventory of spent nuclear fuel  
("SNF") assemblies stored in the Oconee spent fuel storage  
pools ("pools") prior to upcoming refueling outages.  
Oconee needs to remove SNF assemblies from the pools to  
accommodate planned and potential refueling activities that  
require empty fuel storage locations. The SNF assemblies  
that are removed will be loaded into Standardized NUHOMS®-

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24P DSCs and placed into dry storage in the Oconee Independent Spent Fuel Storage Installation ("ISFSI").

Consistent with prior loadings under both the original issue of the applicable NRC Certificate of Compliance ("CoC"), and Amendment 1 thereof, Duke desires to load SNF assemblies with a NOMINAL width of 8.536 inches (unirradiated) into the Standardized NUHOMS®-24P DSCs. However, Amendment 2 of the applicable NRC CoC for these canisters (72-1004) incorrectly specifies a more restrictive MAXIMUM width of 8.536 inches (unirradiated). Thus, an exemption is needed for Oconee's near term loading of these fuel assemblies.

As demonstrated in the two Attachments to this letter,<sup>1</sup> Duke's request satisfies applicable NRC requirements as set forth in 10 CFR §72.7 and 10 CFR §50.12, and therefore, should be granted. Currently, there are not enough empty fuel storage locations in the Unit 3 pool to accommodate a number of planned and potential refueling activities that require empty spent fuel storage locations. These activities include offloading all fuel assemblies from the reactor, storing new fuel assemblies in the pool, performing fuel inspection and repair, and repairing the fuel transfer system upender, if required.

In July 1990, Duke began operation of the Oconee ISFSI under a 10 CFR Part 72 specific license (SNM-2503). That specific license permits the storage of B&W 15x15 spent fuel assemblies in the site-specific NUHOMS®-24P DSCs. The Technical Specifications for that license do not specify a fuel assembly width dimension. Duke has loaded forty (40) site-specific NUHOMS®-24P DSCs, to date.

In February 1999, Duke completed a transition to the Standardized version of the NUHOMS®-24P system, which the

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<sup>1</sup> Attachment 1 to this letter sets forth the regulatory bases supporting this exemption request. It also addresses the NRC criteria governing the granting of exemptions under 10 CFR §72.7 and §50.12. Attachment 2 contains information concerning the adverse impact on Oconee's refueling activities of having fewer than the desired empty spent fuel storage locations available during refueling outages.

NRC has approved for use under a Part 72 general license. Consistent with Oconee's site-specific ISFSI license, the Technical Specifications contained in the original issue and Amendment 1 of CoC 72-1004 for the Standardized NUHOMS®-24P system called out a "Nominal Cross-Sectional Envelope." The value for this dimension was not specified. Instead, the specification referred to Chapter 3 of the Safety Analysis Report ("SAR"), which indicated a value of 8.536 inches for this parameter. Duke has loaded eighteen (18) Standardized NUHOMS®-24P DSCs, to date.

On September 5, 2000, the NRC issued Amendment 2 to CoC 72-1004 to increase the burnup limit of the stored SNF assemblies and allow storage of burnable poison rod assemblies contained in the SNF assemblies. The Technical Specifications issued with this Amendment 2 changed the call out from "Nominal Cross-Sectional Envelope" with a reference to the SAR, to "Maximum Assembly Width (unirradiated)" with a value of 8.536 inches specified.<sup>2</sup>

It is important to note that the width of the B&W 15x15 fuel assembly design has not been modified since the issuance of the Oconee site-specific ISFSI license or the original issuance of CoC 72-1004, nor has there been any significant change in the construction of the NUHOMS®-24P DSC basket assembly. The guide sleeves that contain the fuel assemblies have always been designed and constructed to accommodate B&W 15x15 fuel assemblies.

The issue confronting Duke is that the dimension of 8.536 inches corresponds to a NOMINAL, unirradiated width of the B&W 15x15 fuel assembly design. The MAXIMUM width dimension, including tolerances, slightly exceeds 8.536 inches. (The MAXIMUM value is considered proprietary to Framatome-ANP, the designer and manufacturer of this fuel design). Thus, the Amendment 2 call out for a MAXIMUM of

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<sup>2</sup> Both the NRC staff and Transnuclear West acknowledge that the change in width from "nominal" to "maximum" was due to an administrative error. There were no changes in the underlying design bases that would necessitate this change, and the CoC holder (Transnuclear West) did not intentionally request this change. Further, the fuel assembly width call out is not related to any safety significant issue.

8.536 inches essentially excludes ALL B&W 15x15 fuel assemblies, and Duke is unable to comply with the Technical Specification. While Transnuclear West (TNW) is seeking an amendment to the CoC to correct the administrative error<sup>3</sup>, Duke's immediate need to load SNF assemblies into dry storage necessitates this exemption request.

Duke has confirmed with Transnuclear West, that a grant of such an exemption by the NRC would be consistent with the design bases of the NUHOMS®-24P storage system and would pose no safety issues. Additionally, there would be no operational issues associated with such an exemption as evidenced previously by Duke's successful previous fifty-eight (58) loadings of NUHOMS®-24P DSCs with B&W 15x15 SNF assemblies.

Duke's most immediate need to load SNF assemblies into NUHOMS®-24P DSCs will be during July and August 2001, when Duke will need to load 3 NUHOMS®-24P DSCs under Amendment 2 of the CoC in preparation for the next Unit 3 refueling. The start of the first loading operation is scheduled to begin on July 9, 2001.

Duke requests the NRC's prompt consideration of this exemption from the requirements of 10 CFR §72.212(a)(2) and 10 CFR §72.214, as further set forth in Attachment 1 to this letter. As previously noted, Attachment 2 contains additional information about the impact on Oconee's refueling operations if this exemption is not granted. Duke also requests that this exemption remain valid until the CoC amendment requested by TNW is granted and becomes effective. In light of the above, Duke respectfully requests NRC approval of this exemption before July 9, 2001.

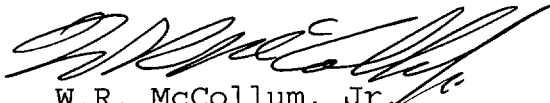
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<sup>3</sup> Reference TNW letter no. NUH03-01-1706 of June 8, 2001, "Revision 1 of Application for Amendment No. 4 of NUHOMS® CoC No. 1004 for Dry Spent Fuel Storage Casks."

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This request for exemption has been reviewed and approved by Oconee's Plant Operations Review Committee. Should you have any questions concerning this submittal, or if Duke can provide additional information, please contact Stephen C. Newman, Regulatory Compliance Group, at (864) 885-4388.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'W.R. McCollum, Jr.', written in a cursive style.

W.R. McCollum, Jr.  
Site Vice President  
Oconee Nuclear Site

Attachments

cc:

L. A. Reyes, Regional Administrator  
U.S. Nuclear Regulatory Commission, Region II  
Atlanta Federal Center  
61 Forsyth Street, SWW, Suite 23T85  
Atlanta, GA 30303

D.E. LaBarge, NRC Project Manager (ONS)  
U.S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
Mail Stop 08-H-12  
Washington, DC 20555

W. B. Gloersen, Senior Fuel Facility Inspector  
U.S. Nuclear Regulatory Commission, Region II  
Atlanta Federal Center  
61 Forsyth Street, SWW, Suite 23T85  
Atlanta, GA 30303

M. C. Shannon, Senior Resident Inspector (ONS)

Dr. C. L. Miller, Deputy Director  
U.S. Nuclear Regulatory Commission  
Office of Incident Response Operations  
Mail Stop T4-D18  
Washington, DC 20555

T. J. Kobetz, Senior Project Manager  
U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards  
Mail Stop 06-F18  
Washington, DC 20555

**REQUEST FOR EXEMPTION TO PERMIT STORAGE OF FUEL ASSEMBLIES  
IN STANDARDIZED NUHOMS®-24P CANISTERS LICENSED UNDER  
AMENDMENT 2 OF THE CERTIFICATE OF COMPLIANCE (72-1004)  
REGULATORY BASES & NRC CRITERIA**

Duke Energy Corporation ("Duke") herein requests an exemption from the NRC general license conditions set forth in 10 CFR §72.212(a)(2), and from certain conditions in the NRC Certificate of Compliance ("CoC") 72-1004, as set forth in 10 CFR §72.214. Duke seeks this exemption to authorize the dry storage of B&W 15x15 spent nuclear fuel ("SNF") assemblies with a NOMINAL width (unirradiated) of 8.536 inches in Standardized NUHOMS®-24P dry shielded canisters ("DSCs") at the Oconee Nuclear Site ("Oconee").<sup>4</sup>

As discussed below, CoC 72-1004, Amendment 2 specifies a MAXIMUM width rather than a NOMINAL width. As such, the specification would preclude storage of any B&W 15x15 SNF assemblies. The inability to store SNF assemblies in the Standardized NUHOMS®-24P DSCs has placed Oconee in a situation that necessitates prompt regulatory relief.

As of July 9, 2001, when Oconee plans to load 3 NUHOMS®-24P DSCs under Amendment 2 of the CoC, there will be 277 empty fuel storage locations in the Oconee Unit 3 spent fuel storage pool ("pool"). This number of empty locations is less than required for normal refueling operations and contingencies. It is Oconee's practice to establish a minimum of 345 empty fuel storage locations in the spent fuel pool before receiving the new fuel assemblies that will be loaded into the reactor for the next operating cycle. The requirements for 345 empty fuel storage locations in the spent fuel pool prior to receipt of new fuel are as follows:

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<sup>4</sup> 10 CFR §72.210 issues a general license to store spent fuel in an ISFSI at reactor sites as long as the Part 50 reactor license remains in effect. 10 CFR §72.212(a)(2) limits the storage of spent fuel to casks approved in 10CFR72 Subpart K, and 10 CFR §72.214 lists cask types approved for use under the general license, including the Standardized NUHOMS®-24P. Section 72.214 states that these casks "are approved for storage under the conditions specified in their Certificates of Compliance."

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|------------------|-----|---|
| Core offload:    | 177 | Minimum number of storage locations required to minimize critical path outage time, and to allow low point reactor coolant system maintenance.  |
| Diver clearance: | 168 | Minimum number of storage locations around an upender that must be empty of irradiated fuel to permit diver access in case of upender failure. These fuel storage locations are also used for storage of the new fuel, as well as fuel inspection or repair, if needed. |

New fuel for the upcoming cycle is stored within the 168 spaces that are emptied for repair of an upender.

While the Oconee reactors can be refueled with fewer than the normal 345 empty locations, doing so could result in additional complexity in performing what would otherwise be routine refueling activities, prolonging the refueling outage, and additional radiological exposure. A discussion of refueling activities with less than the desired empty locations is provided in Attachment 2.

Consequently, the best approach is to load sufficient SNF assemblies into dry storage, beforehand, such that the desired number of empty fuel storage locations is available during refueling.

#### **Evaluation of Oconee's Options**

Duke has evaluated its options for creating the needed empty storage locations in the Oconee pools. Generally, empty locations may be created either by installing additional storage locations, or by removing SNF assemblies from existing locations and placing them into dry storage. The options Duke has considered are as follows:



1. Add Fuel Storage Locations to the Oconee Pools

There is no room in the spent fuel pools to place an additional storage rack. Total re-racking of the pools is impractical, given the current high SNF inventories. Also, very few additional fuel storage locations could be created by a re-rack since the pools already employ high-density, neutron-absorber racks. The designs used in the pools, while not the most recent, provide only slightly fewer storage locations than that afforded by more recent designs. In any event, the creation of only a few additional fuel storage locations would not justify the increased radiological occupational exposure associated with re-racking, and the large quantity of low level radioactive waste ("LLW") created. Finally, there is insufficient time to re-rack the spent fuel pool prior to the Unit 3 refueling, even if it were otherwise advantageous to do so.

2. Load Additional NUHOMS®-24P DSCs Under Oconee's Site-Specific License

Storage of B&W 15x15 SNF assemblies with a NOMINAL fuel assembly width of 8.536 inches is already authorized by Oconee's site-specific Part 72 license. However, Duke would have to seek an amendment to this license to accommodate both the burnup and decay heat capacity needed for the remaining SNF assemblies in the Oconee pools. Again, it is unlikely the NRC's approval of such an amendment could be completed in time to address Oconee's imminent needs.

3. Load Additional Standardized NUHOMS®-24P DSCs Under Earlier Version of CoC 72-1004

Storage of B&W 15x15 SNF assemblies with a NOMINAL fuel assembly width of 8.536 inches is permitted by CoC 72-1004, as originally issued, and also by Amendment 1. However, this option is not available to Oconee because the burnup and cooling time of the SNF assemblies available for storage are not compatible with the burnup and cooling time limits of these earlier versions of CoC 72-1004.

4. Obtain an Amendment to CoC 72-1004 for the  
Standardized NUHOMS®-24P Storage System

As previously stated, Transnuclear West will be seeking an amendment to the CoC to authorize storage of B&W 15x15 SNF assemblies with a NOMINAL fuel assembly width of 8.536 inches. However, the process for NRC review and approval of the amendment may not be timely with respect to the need to load SNF assemblies into NUHOMS®-24P DSCs this summer.

5. Obtain an Exemption from the Requirements 10 CFR  
§72.212(a)(2) and 10 CFR §72.214

Because of the limitations of the other options evaluated, this is the best option available to Duke to address this situation on an interim basis (pending a CoC amendment) and avoid impacting refueling operations at Oconee.

**Satisfying 10 CFR §72.7 Requirements**

10 CFR §72.7 allows the Commission, upon application by any interested person, or upon its own initiative to "grant exemptions from the requirements of the regulations... as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest."

Duke contends that granting this exemption request is authorized by law, because such exemptions are explicitly contemplated by 10 CFR §72.7. Further, granting this exemption request will not endanger life or property or the common defense and security and are otherwise in the public interest. In support of this assertion, it noted that Transnuclear West personnel have confirmed that storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches would be consistent with the both the previous versions of CoC 72-1004 and the existing Standardized NUHOMS® SAR and its supporting calculations<sup>5</sup>. Thus, granting of this exemption request will not endanger life or property or the common defense and security. The request is otherwise in the public interest because it will

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<sup>5</sup> Reference Transnuclear West letter, Robert Grenier to Timothy Kobetz, "Administrative Error in NUHOMS CoC 72-1004, Amendment No. 2," May 25, 2001.

avoid unnecessary complications and radiological exposure in refueling operations, as discussed in Attachment 2.

**Technical Considerations Supporting Issuance of the Exemption**

1. Structural Evaluation

The storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches does not affect the structural evaluation of the long cavity DSC presented in the SAR. It is consistent with the existing supporting calculations for the NUHOMS®-24P storage system. The weight of the B&W 15X15 fuel assembly has not changed, nor has the design of the DSC.

2. Thermal Evaluation

The storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches does not impact the cladding temperature of the fuel assemblies stored in the NUHOMS®-24P DSC. It is consistent with the existing supporting calculations for the NUHOMS®-24P storage system. The fuel assembly thermal properties have not changed.

3. Pressure Evaluation

The storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches does not impact the internal pressure during normal, off-normal, and accident conditions. It is consistent with the existing supporting calculations for the NUHOMS®-24P storage system. Neither the volume nor internal gas pressure of the B&W 15x15 fuel assembly have changed, nor has the internal volume of the DSC been changed.

4. Radiological Source Term and Shielding Evaluation

The storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches does not impact the radiological source terms or shielding evaluation. It is consistent with the existing supporting calculations for the NUHOMS®-24P storage

system. Neither the construction or materials of the B&W 15x15 fuel assembly have changed, nor has the shielding capability of the DSC.

#### 5. Criticality Evaluation

The storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches does not impact the criticality evaluation. Again, this is consistent with the existing supporting calculations for the NUHOMS®-24P storage system. Additionally, the width dimension of the B&W 15x15 fuel assembly is not a criticality evaluation input parameter.

As demonstrated by the evaluation results above, the granting of this exemption would have no safety significance. Therefore, it would not endanger life or property or the common defense and security. Under the criteria set forth in Section 72.7, the NRC should issue the requested exemption.

#### **"Special Circumstances" Supporting Issuance of This Exemption**

While 10 CFR §72.7 does not specifically require a showing of "special circumstances" like those required under 10 CFR Part 50, Duke's exemption request can be further justified using several of the special circumstances that the Commission has identified as relevant under 10 CFR §50.12. These applicable special circumstances are discussed below:

1. *10CFR50.12(a)(2)(ii)- Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.*

The underlying purpose of 10 CFR §72.212 and §72.214 is to allow reactor licensees to utilize dry fuel storage casks that have previously been found by the NRC to be safe for use. Storage of B&W 15x15 fuel SNF assemblies in NUHOMS®-24P DSCs has previously been found by the NRC to be safe. Further, the B&W 15x15 fuel assembly design has not changed, nor has the DSC changed. Finally, the evaluations described above demonstrate that such storage is safe. Thus, storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches in the Standardized

NUHOMS®-24P DSCs is consistent the underlying purpose of 10 CFR §72.212 and §72.214.

2. *10CFR50.12(a)(2)(iii) - Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or those incurred by others similarly situated.*

Since CoC 72-1004 for the Standardized NUHOMS®-24P system had previously permitted storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches, there exists the potential for Duke to incur "undue hardships and other costs significantly in excess of those contemplated" when Part 72 was adopted. Absent an amendment to the CoC, or an exemption from the requirements 10 CFR §72.212(a)(2) and 10 CFR §72.214, Oconee's refueling operations will be impacted as more fully described in Attachment 2.

3. *10CFR50.12(a)(2)(v) - The exemption would provide only temporary relief from the applicable regulation and the licensee or applicant has made good faith efforts to comply with the regulation.*

Since Transnuclear West is seeking an amendment to CoC 72-1004 to allow storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches, Duke's requested exemption need only provide "temporary relief" from the applicable NRC regulations during the interim until the requested amendment is issued and becomes effective.

### **Conclusion**

In conclusion, Duke requests an exemption to the requirements of 10 CFR §72.212(a)(2) and 10 CFR §72.214 to allow loading and storage of B&W 15x15 fuel assemblies with a NOMINAL width (unirradiated) of 8.536 inches in Standardized NUHOMS®-24P DSCs. Duke also requests that the exemption remain in effect until such time as an amendment to CoC 72-1004, to permit such storage, has been issued and is effective. For the reasons outlined in this submittal, Duke respectfully requests that this exemption be approved by July 9, 2001.

**REQUEST FOR EXEMPTION TO PERMIT STORAGE OF FUEL ASSEMBLIES  
IN STANDARDIZED NUHOMS®-24P CANISTERS LICENSED UNDER  
AMENDMENT 2 OF THE CERTIFICATE OF COMPLIANCE (72-1004)  
ADVERSE IMPACTS ON OCONEE**

The Unit 3 spent fuel pool will have 277 empty storage locations as of July 9, 2001. While this quantity is sufficient to accommodate the 233 empty spaces required for the core offload (177 empty locations) and the new fuel (56 empty locations) during the Unit 3 End-of-Cycle 19 ("EOC"19) refueling in Fall 2001, there would not be enough empty spaces for a potential repair of an upender if it were to fail during certain core offload or reload periods. Three additional NUHOMS®-24P DSCs are scheduled to be loaded under Amendment 2 of the CoC during Oconee's planned dry storage campaign starting July 9, 2001. Loading of these 3 DSCs would provide the required minimum of 345 empty storage locations.

The following discussion provides additional information about the impact on Oconee's Fall Unit 3 refueling if Duke is unable to move additional SNF assemblies into dry storage in the loading campaigns described above.

**Impact on Unit 3 Fall 2001 Refueling**

If the one of the upenders were to fail during a certain time during the offload or reload, the lack of sufficient diving clearance would cause both outage delays and increased radiological exposure. At Oconee, the redundant fuel transfer systems for each of the Oconee reactors are located adjacent to the spent fuel storage racks and cannot be isolated from the spent fuel pool for repairs. Thus, if one of the redundant upenders were to fail during the reactor core offload or reload, a diver would be required for repair of the upender.

In the Oconee spent fuel pools there are no intervening shield walls between the fuel transfer system and the spent fuel storage racks. Thus, the area adjacent to the upender must be clear of irradiated fuel assemblies to avoid excessive dose to a diver during repair. A minimum of 168 fuel storage locations are required. It is acceptable to store the new fuel assemblies in any of these 168 storage

ATTACHMENT 2

Adverse Impacts on Oconee

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locations, and the 56 new fuel assemblies for Cycle 20 will be stored, accordingly.

With only 277 empty storage spaces prior to the start of the EOC 19 refueling outage, the Oconee 3 spent fuel pool would have only 100 empty storage locations once the core is offloaded ( $277 - 177 = 100$ ), or a shortfall of 68 empty locations for the diving clearance ( $168 - 100 = 68$ ). Specifically, the requisite 168 storage locations empty of irradiated fuel assemblies would be lost after 109 fuel assemblies ( $277 - 168 = 109$ ) had been offloaded from the reactor. Thus, there would not be sufficient diving space as the last 68 fuel assemblies are offloaded from the core ( $177 - 109 = 68$ ).

Additionally, this lack of sufficient diving clearance would continue until 73 fuel assemblies are transferred back to the reactor during the reload. If one of the upenders were to fail during offload or reload of these 68 fuel assemblies, it would be necessary to transfer some fuel assemblies back to the reactor using the other upender and fuel transfer system to establish the required clearance for a diver. This would cause a significant delay in the offload or reload and prolong the refueling outage.

In addition to the potential outage delays described above, there would be radiological consequences if the remaining upender also fails while transferring fuel assemblies back to the reactor to create diving clearance. A diver would have to make an upender repair with less the required clearance from irradiated spent fuel.