

SUNSI Review Complete
Template = ADM-013
E-RIDS=ADM-03
ADD=Karen Zeleznock,
Paula Belchman

PUBLIC SUBMISSION

COMMENT (1)
PUBLICATION DATE:
11/7/2018
CITATION 83 FR 55568

| |
|--|
| As of: 11/29/18 9:21 AM |
| Received: November 28, 2018 |
| Status: Pending_Post |
| Tracking No. 1k2-96t2-n2em |
| Comments Due: December 06, 2018 |
| Submission Type: Web |

Docket: NRC-2018-0246

Biweekly Notice; Applications and Amendments to Facility Operating Licenses and Combined Licenses Involving No Significant Hazards Considerations

Comment On: NRC-2018-0246-0001

Biweekly Notice; Applications and Amendments to Facility Operating Licenses and Combined Licenses Involving No Significant Hazards Considerations

Document: NRC-2018-0246-DRAFT-0001

Comment on FR Doc # 2018-23782

Submitter Information

Name: Rick Ennis

Address:

19144 Hempstone Ave
Poolesville, MD, 20837

Email: ennis.rick@verizon.net

General Comment

See attached pdf file for comments.

Attachments

Byron Unit 2 ATF LTA Comments

**Byron Unit 2, Docket No. 50-455
Comments Regarding Proposed License Amendment
to Utilize Accident Tolerant Fuel Lead Test Assemblies
Submitted by Rick Ennis
November 28, 2018**

Introduction

The following comments pertain to the Byron Unit 2 license amendment request (LAR) dated March 8, 2018 (ADAMS Accession No. ML18067A431), as supplemented by letter dated July 2, 2018 (ADAMS Accession No. ML18184A270). The proposed amendment would authorize the use of a limited number of Accident Tolerant Fuel (ATF) Lead Test Rods (LTRs) in two Lead Test Assemblies (LTAs) during Byron Unit 2, Cycles 22, 23, and 24. The proposed amendment was noticed in the *Federal Register* on November 6, 2018 (83 FR 55573).

These comments are dedicated to the memory of the late Mr. Harold K. Chernoff. Mr. Chernoff always reminded the NRC staff members he worked with to “always reserve the right to get smarter.” It is my hope that the NRC staff will “get smarter” on the regulatory path regarding LTAs based, in part, of the numerous comments and analysis previously provided by Mr. Chernoff and others on this issue.

Background

By *Federal Register* notice (FRN) dated June 7, 2018 (83 FR 26503), as supplemented by FRN dated July 2, 2018 (83 FR 30989), the NRC solicited public comments on a draft letter to the Nuclear Energy Institute (NEI) “clarifying the regulatory paths for the use of lead test assemblies (LTAs)” (ADAMS Accession No. ML18100A045).

As a former NRC staff member, I previously raised a number of concerns on the proposed regulatory framework regarding use of LTAs. These concerns were summarized in an internal NRC memo to the NRC’s General Counsel, dated March 22, 2018, which I co-authored with Mr. Chernoff (ADAMS Package Accession No. ML18078A010). The March 22, 2018, memo raised concerns regarding an earlier version of the draft letter to NEI. Following my retirement from the NRC in the spring of 2018, Mr. Chernoff filed a non-concurrence on the current version of the NEI letter (ADAMS Accession No. ML18151B016).

The NRC has not yet resolved the comments received on the regulatory framework described in the draft memo to NEI. As such, final guidance regarding the use of LTAs has not been issued.

Comment 1 – Need for an Exemption

As discussed in Section 4.1 of Attachment 1 to the Byron Unit 2 application dated March 8, 2018:

10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," requires nuclear power reactors fueled with uranium oxide pellets within cylindrical Zircaloy or ZIRLO cladding to be provided with an emergency core cooling system with certain performance requirements.

Although the Westinghouse EnCore® and ADOPT™ Lead Test Rods contain fuel and cladding material other than those defined in 10 CFR 50.46, the acceptance criteria specified in 10 CFR 50.46 will continue to be satisfied for the Byron Station Unit 2 core. [emphasis added]

As discussed in the supplement dated July 2, 2018, some of the LTRs would include standard Optimized ZIRLO™ cladding, chromium coated Optimized ZIRLO™ cladding and uranium silicide fuel pellets. None of these cladding and fuel materials are specified in 10 CFR 50.46.

Pages 7 and 8 of the NRC's draft letter to NEI discusses whether exemptions from 10 CFR 50.46 are needed for fuel systems that do not use uranium oxide fuel within zircaloy or ZIRLO cladding (i.e., the materials currently specified in 10 CFR 50.46). The letter argues that exemptions are not needed for LTAs that use other pellet or cladding materials. This is a new interpretation of the rule as is evidenced by the long history of exemptions issued for LTAs. Table 2 of Enclosure 2 of the March 22, 2018, memo to the General Counsel lists examples of exemptions for use of LTAs from 1991 through 2017. The new interpretation of the rule, as described in the draft letter to NEI, appears to have been initiated by NRC technical staff members (e.g., during the 2017 Regulatory Information Conference (RIC)), contrary to the understanding of the relevant regulations and history by NRC staff in the licensing organization. Statements by staff outside the licensing organization have created the confusion in the industry that didn't exist previously. Hence, the need for a clarification letter. The draft letter tries to downplay the regulatory history by indicating that "[i]n the past some licensees have requested exemptions to expand the applicability of 50.46 to other zirconium alloys. The NRC staff has granted these exemptions." In other words, the NRC letter is implying that the licensees didn't realize exemptions weren't needed, but since the licensees submitted applications, the NRC staff just went ahead and processed the requests. Given that the NRC staff performs acceptance reviews on applications for items needed prior NRC approval, the staff should have told the licensees to withdraw the LTA exemption requests if they weren't necessary. However, the evidence shows the NRC has routinely accepted exemption requests for review for LTA cladding materials different than those listed in 10 CFR 50.46.

Further evidence that the draft letter to NEI provides a new interpretation of 10 CFR 50.46 are recent industry documents that acknowledge the need for exemptions for LTAs with cladding or fuel pellet materials different than specified in 10 CFR 50.46. One example is a Westinghouse Report (prepared under contract to the Department of Energy) titled "Development of LWR Fuels with Enhanced Accident Tolerance Final Technical Report," dated October 30, 2015: <http://www.iaea.org/inis/collection/NCLCollectionStore/Public/47/046/47046013.pdf> Section 3.5 of the report, "Future Regulatory Actions," states, in part, that:

Prior to full scale implementation of ATF [accident tolerant fuel], changes to a number of regulations will be required. While Phase 1 and 2 can be completed with the use of exemption requests, to move towards a more efficient loading process and implementation plan, rulemaking will be needed to remove the references to "zirconium-based" cladding and UO₂ pellets. In particular, rulemaking will be required to modify the requirements contained in 10 CFR 50.46 and 10 CFR 50, Appendix K.

Section 6 of the report, "Phase 2 - Lead Test Assembly Activities," states in, part, that:

Similar to the LTR [lead test rod] process, exemption requests from NRC regulations regarding cladding and fuel pellet material will be required during the LTA phase. As with the LTRs, these exemption requests will need to be filed 2 years in advance of LTA load.

The bottom line is that the NRC's letter to NEI provides a new interpretation of 10 CFR 50.46 that is not supported by the language and history of the rule. To argue otherwise is not credible.

There are a number of decisions of the Commission, the Atomic Safety and Licensing Appeal Board Panel, and the Atomic Safety and Licensing Board Panel that weigh in on the issue of how the specific language in a rule and agency practice should be considered in interpretation of the NRC regulations. Specifically, Section 6.21.5, "Agency's Interpretation of its Own Regulations," in [NUREG-0386, Digest 16, "United States Nuclear Regulatory Commission Staff Practice and Procedure Digest, Commission, Appeal Board and Licensing Board Decisions, July 1972 – September 2010."](#) cites the following decisions pertinent to this issue:

Agency practice, of course, is one indicator of how an agency interprets its regulations. See *Power Reactor Development Co. v. International Union*, 367 U.S. 396, 408 (1961) *Yankee Atomic Electric Co. (Yankee Nuclear Power Station)*, CLI-96-6, 43 NRC 123, 129 (1996); *Sequoyah Fuels Corp. (Gore, OK, Site Decommissioning)*, CLI-01 -2, 53 NRC 2, 13 (2001); *Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation)*, CLI-99-10, 49 NRC 318, 324 (1999); *Sequoyah Fuels Corp. (Gore, OK, Site Decommissioning)*, CLI-01-2, 53 NRC 2, 14 (2001).

Where NRC interprets its own regulations and where those regulations have long been construed in a given way, the doctrine of *stare decisis* will govern absent compelling reasons for a different interpretation; the regulations may be modified, if appropriate, through rulemaking procedures. *New England Power Co. (NEP Units 1 & 2), Public Service Co. of New Hampshire (Seabrook Station, Units 1 & 2)* ALAB-390, 5 NRC 733, 741-42 (1977).

In the *Perry* decision (CLI-96-13, 44 NRC 315, 1996), the Commission (44 NRC 315 at 325) stated that:

The Staff is certainly free to change rule interpretations if appropriate. **But the staff may not adopt an interpretation unsupported by the language and history of the rule.** [emphasis added]

Based on the above, it is concluded that exemption requests should continue to be the path forward, until the necessary rulemaking is completed.

On June 20, 2016, the NRC staff issued an exemption from the requirements in 10 CFR 50.46 and Appendix K to 10 CFR Part 50, to allow the use of Optimized ZIRLO™ fuel cladding materials at Byron, Units 1 and 2, and Braidwood, Units 1 and 2 (reference ADAMS Accession Nos. ML16126A032 (letter) and ML16126A061 (exemption)). Associated license amendments were issued on August 1, 2016 (ADAMS Accession No. ML16180A251) to include Optimized ZIRLO™ as an acceptable cladding material in Technical Specification (TS) 4.2.1, "Fuel Assemblies". This TS currently only allows uranium dioxide fuel pellets.

As such, in order for Byron Unit 2 to utilize the proposed LTAs, an exemption is needed to authorize pellet and cladding materials not currently specified in 10 CFR 50.46 and assumed in 10 CFR Part 50, Appendix K (if not currently authorized under its license). As noted above, the 2016 exemption already authorized the use of Optimized ZIRLO™ fuel cladding. Therefore, for use of the proposed LTAs, an exemption would be needed for use of chromium coated Optimized ZIRLO™ cladding and the uranium silicide fuel pellets.

From a plant-specific basis, it is interesting to note that Table 2 of Enclosure 2 of the March 22, 2018, memo to the General Counsel lists 3 exemptions granted to Byron Unit 2 for LTAs with cladding material different than that specified in 10 CFR 50.46 (reference exemptions issued on 9/22/03 (ML031910765), 6/30/06 (ML061380518), and 4/30/09 (ML090490645)). Since the LTA guidance has not yet finalized, it is not entirely clear why the licensee did not submit an exemption request along with the current proposed LAR for Byron Unit 2. However, there are some words in the licensees' March 8, 2018, cover letter for the LAR application that indicate "regulatory uncertainty regarding the licensing approach for accident tolerant fuel LTAs." It can be speculated that the licensee assumed the guidance would be finalized before the NRC's LAR review was complete and that exemptions would not be needed. Given the current status of the guidance, in addition to the fact that the 10 CFR 50.46 rulemaking has not yet been completed, it is clear that the licensee still needs to submit an exemption.

Comment 2 – License Authority

For each amendment issued, the NRC staff needs to find that:

The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission.

The above words, shown in each NRR license amendment, are based on the requirements in 10 CFR 50.57, "Issuance of operating license."

As discussed in Comment 1, the licensee has not requested an exemption from 10 CFR 50.46 for use of LTAs with coated Optimized ZIRLO™ cladding and uranium silicide fuel pellets. Without an exemption, the licensee would not be able to operate the facility in conformance with the rules and regulations of the Commission, as required by 10 CFR 50.57. **As such, the amendment could not be made effective without the exemption (i.e., licensee would not have authority under the license to load the LTAs into the reactor core).**

As described below, a recent license amendment and exemption for Beaver Valley, related to fuel assembly cladding material, reveals important information on the regulatory framework associated with LTAs and supports the above position regarding license authority.

On March 1, 2018, the NRC issued an exemption for Beaver Valley, Units 1 and 2 ([ML17313A554](#)). The exemption was published in the *Federal Register* on March 6, 2018 (83 FR 9550). The exemption allows the batch loading of fuel assemblies that use Optimized ZIRLO™ fuel rod cladding material. Similar to the exemptions for LTAs, this exemption stated, in part, that:

Pursuant to title 10 of the *Code of Federal Regulations* (10 CFR) section 50.12, "Specific exemptions," the licensee requested, by letter dated April 9, 2017 (ADAMS Accession No. ML17100A269), an exemption from § 50.46, "Acceptance criteria for emergency core cooling systems [ECCS] for light-water nuclear power reactors," and 10 CFR part 50, appendix K, "ECCS Evaluation Models," to allow the use of Optimized ZIRLO™ fuel rod cladding for future core reload applications. The regulations in § 50.46 contain acceptance criteria for the ECCS for reactors fueled with zircaloy or ZIRLO® fuel rod cladding material. In addition, 10 CFR part 50, appendix K, requires that the Baker-Just equation be used to predict the rates of energy release, hydrogen concentration, and cladding oxidation from the metal/water reaction. The Baker-Just equation assumes the

use of a zirconium alloy different from Optimized ZIRLO™ material. Therefore, an exemption to § 50.46 and 10 CFR part 50, appendix K, is required to support the use of Optimized ZIRLO™ fuel rod cladding at Beaver Valley.

The exemption request relates solely to the specific types of cladding material specified in these regulations for use in light-water reactors (i.e., fuel rods with zircaloy or ZIRLO® cladding). [emphasis added]

The exemption also stated:

This exemption would allow the use of Optimized ZIRLO™ fuel rod cladding material at Beaver Valley. As stated above, § 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR part 50. **The fuel that will be irradiated at Beaver Valley contains cladding material that does not conform to the cladding material that is explicitly defined in 10 CFR 50.46 and implicitly defined in 10 CFR part 50, appendix K.** However, the criteria of these regulations will continue to be satisfied for the operation of the Beaver Valley cores containing Optimized ZIRLO™ fuel cladding. [emphasis added]

In addition to the exemption request discussed above, the licensee's application dated April 9, 2017 ([ML17100A269](#)) included a related license amendment request to revise the Beaver Valley Technical Specifications (TS) to allow the use of Optimized ZIRLO™ fuel rod cladding material. Specifically, the licensee proposed to revise TS 4.2.1, Fuel Assemblies," to add Optimized ZIRLO™ to the approved fuel rod cladding materials and to revise TS 5.6.3, Core Operating Limits Report," to add a Westinghouse approved topical report to the list of approved analytical methods used to determine the reactor core operating limits. On March 1, 2018, the NRC approved the amendments for Beaver Valley, Units 1 and 2. The staff's safety evaluation ([ML18022B116](#)) stated, in part, that:

The regulations in 10 CFR 50.46 and 10 CFR Part 50, Appendix K, make no provisions for use of fuel rod cladding material other than Zircaloy or ZIRLO®. **Since the material specifications of Optimized ZIRLO™ differ from the specification for Zircaloy or ZIRLO®, a plant-specific exemption is needed to permit an amendment, which this SE supports, to be effective.** The exemption is issued separately from but with support from this SE and amendments. [emphasis added]

Although the exemption and amendments discussed above relate to batch loading of fuel assemblies, with cladding material different than currently specified in 10 CFR 50.46, there are some important aspects of these licensing decisions that also relate to LTAs. As noted in the NRC staff safety evaluation for the Beaver Valley amendments, the exemption needed to be issued in order for the amendment to be effective. **In other words, the licensee had no authority to install the subject fuel assemblies unless an exemption was approved allowing cladding materials different than those specified in 10 CFR 50.46.**

Based on the above, an exemption is needed to make the associated license amendment effective. Without an exemption (i.e., for use of chromium coated Optimized ZIRLO™ cladding and uranium silicide fuel pellets), the licensee would not have the authority under the license to load the LTAs into the reactor core.

Comment 3 – Proposed Amendment Needs to Revise TS 4.2.1

The proposed amendment would add an “Additional Condition” to TS Appendix C. However, the license has not proposed any changes to TS 4.2.1, “Fuel Assemblies.” This TS currently reads as follows:

The reactor shall contain 193 fuel assemblies. Each assembly shall consist of a matrix of Zircaloy, ZIRLO[®], or Optimized ZIRLO[™] clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide (UO₂) as fuel material. Limited substitutions of zirconium alloy or stainless steel filler rods or vacancies for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases. A limited number of lead test assemblies that have not completed representative testing may be placed in nonlimiting core regions.

Since LTAs are part of the total number of fuel assemblies in the core, the “193 fuel assemblies” discussed in the first sentence of TS 4.2.1 includes the LTAs. In addition, since the second sentence in TS 4.2.1 starts by saying “each assembly” (and no exception is discussed), it is clear that the second sentence also applies to LTAs. As such, the second sentence needs to include the cladding and fuel pellet materials of the LTAs. **Therefore, merely adding the change to TS Appendix C is not sufficient. The amendment needs to include changes to TS 4.2.1 to also list chromium coated Optimized ZIRLO[™] cladding and uranium silicide fuel pellets.**

It is noted that TS 4.2.1 is included in the Design Features” section of the TSs. As stated in 10 CFR 50.36(c)(4), design features to be included in the TSs are those features of the facility such as materials of construction and geometric arrangements, which, if altered or modified, would have a significant effect on safety and are not covered by TSs related to safety limits, limiting safety system settings, and limiting control settings; LCOs; and SRs.

As referenced in the Statement of Consideration (SOC) for a final rule dated December 17, 1968 (33 FR 18610), “Technical Specifications for Facility Licenses; Safety Analysis Reports,” **the NRC expects “those items that are directly related to maintaining the integrity of the physical barriers designed to contain radioactivity” to be included in the TSs.** The SOC referenced a “Guide to Content of Technical Specifications for Nuclear Reactors,” as being available to help provide a sound basis for each technical specification. **With respect to the design features covered by the TSs, this guide, dated November 1968, stated in Section IV.4, “Design Features,” that:**

These technical specifications are intended to cover design characteristics of special importance to each of the physical barriers, and to the maintenance of safety margins in the design.

The above regulatory framework supports the position that the design features TSs need to specify materials of construction of the cladding and fuel pellets, for the proposed LTAs at Byron Unit 2, since these features directly relate to the safety margins in the design.

Comment 4 – Congressional Review Act Considerations

In Section 5 of Enclosure 2 to the March 22, 2018, memo to the General Counsel (ADAMS Accession No. ML18078A013), Mr. Chernoff and I argued that the LTA guidance provides new interpretations of regulatory requirements that has a substantial effect on licensee activities (i.e., would eliminate the need for licensees to submit certain license amendment requests and exemption requests). In addition, the guidance would also have a substantial effect on public stakeholders (i.e., would eliminate the public's ability to request hearings or provide comments on licensee use of LTAs if amendment requests were no longer required). Based on these considerations, the guidance should be considered a rule. Furthermore, since the guidance should be considered a rule, the guidance should be processed in accordance with the NRC's procedures established to meet the requirements of the Congressional Review Act (CRA).

It is my understanding that the NRC staff is processing the draft letter to NEI, containing the LTA guidance, in accordance with the CRA. Since these activities are not yet complete, the NRC should be processing the Byron Unit 2 LAR consistent with long-standing precedent (i.e., use of exemptions and revisions to TS 4.2.1). Any attempt to implement the new guidance before it is finalized would be a violation of the requirements of the CRA.