

DS09  
S. Shankman



NUCLEAR ENERGY INSTITUTE

61 FR 57926  
Nov. 8, 1996

Alan P. Nelson  
SR. PROJECT MANAGER  
PLANT SUPPORT  
NUCLEAR GENERATION DIVISION

February 28, 1997

Mr. David L. Meyer  
Chief, Rules Review and  
Directives Branch,  
Division of Freedom of Information  
and Publication Services  
Mail Stop T-6 D59  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

**SUBJECT:** Notice of Issuance and Availability of Draft NUREG-1567 –  
“Standard Review Plan for Spent Fuel Dry Storage Facilities”  
(61 Fed. Reg. 57926 – November 8, 1996)  
Request for Comments

Dear Mr. Meyer:

The Nuclear Energy Institute (NEI)\* submits these comments on behalf of the nuclear energy industry. NEI utilized an issue task force comprised of industry personnel at companies involved with dry storage and the Electric Power Research Institute (EPRI) to provide industry experience and technical review of the draft “Standard Review Plan for Spent Fuel Storage Facilities,” NUREG-1567 (61 Fed. Reg. 57926 – November 8, 1996). The “Standard Review Plan for Spent Fuel Dry Storage Facilities” (FSRP) should provide guidance to the staff reviewers in the Spent Fuel Project Office in performing safety reviews of license applications for dry storage installations for nuclear materials.

In general, the FSRP covers a wide range of topics and issues that may arise during the course of a dry storage facility Safety Analysis Report (SAR) review. The NUREG, although intended for use by the NRC reviewers, should provide reasonable insight into the regulatory review process for applicants.

\* NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including regulatory aspects of generic operational and technical issues. NEI members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

9703060169 970228  
PDR NUREG  
1567 C PDR



General comments are provided below. Specific comments and more complete treatment of the general comments are enclosed in the "Comment Sheet" format as requested.

NUREG-1567 significantly overlaps NUREG -1536, draft "Standard Review Plan for Dry Cask Storage Systems," (61 Fed. Reg. 11436 - March 20, 1996). Many of the overlapping sections in NUREG-1567 provide better guidance than suggested in NUREG-1536. This is particularly true in Section 7, "Installation Design and Structural Evaluation." Both NUREG documents should be compared so that the salient portions of NUREG-1567 are incorporated into NUREG-1536 in order to provide consistency between the two SRPs.

Each chapter provides "Regulatory Requirements." This section is useful, but the regulation should be referenced rather than quoted. If the NUREG is not revised each time the regulations are changed, it would soon be out of date and no longer useful for determining if regulations are met. It is recommended that the appropriate regulatory requirement be specifically referenced but not repeated.

The scope of NUREG-1567 encompasses all dry storage facilities, including those using dry storage casks. It also addresses systems that might be used in the course of transferring spent fuel from wet to dry storage (e.g., fuel pools). These systems and subsystems are somewhat mixed together in the FSRP, resulting in a confusing format. The industry recommends a review of the format be conducted with a goal of providing a better delineation of requirements for the various system elements (e.g., dry storage vault vs. casks on a pad vs. concrete storage modules).

The industry expects that most of the applications for dry storage will be submitted by licensees to provide on-site dry storage to supplement pool storage. It is also expected that the deployed systems will be casks under 10 CFR 72, Supart L. Other systems might be proposed such as vault storage or casks that have not received approval under Subpart L. The FSRP seems to require the reevaluation of approved Subpart L casks; the subsection on "Certified Casks" is vague as to how the approved casks will be treated. The applicant should need only to demonstrate that their Subpart L cask usage is within the envelope of the site/fuel/ facility characteristics, or submit additional analyses for just those specific areas where the cask design basis differs from that of the intended application.

The FSRP implies that much of the information on pool construction and operation from the Part 50 licensing activities should be included in the SAR for the dry storage facility. A reactor pool facility has been previously reviewed and approved by the NRC. Thus, the applicant should need only to show that the proposed dry

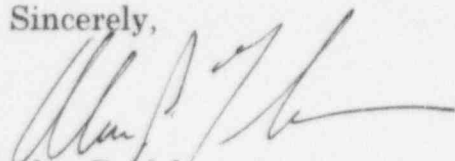
Mr. David L. Meyer  
February 28, 1997  
Page 3

storage activities fall within the pool design basis envelope or alternatively, offer additional analyses in specific areas where the dry storage activities differ from those previously approved for the pool. The SAR and associated review should focus on those aspects of the application that have safety significance and represent unreviewed systems and the interactions of those systems with existing facilities. Re-analysis of existing approved systems is redundant and provides no benefit.

Cask trunnion concerns were identified in the NRC Dry Cask Storage Action Plan dated July 28, 1995, and in the comments submitted by NEI on behalf of the industry for NUREG-1536 dated June 17, 1996. The same comments apply to NUREG-1567, since this is still an unresolved issue. Industry comments submitted for NUREG-1536 noted, "Clarification of trunnion design and testing requirements is needed. The FSRP fails to provide this clarification. The use of ANSI N14.6 for design, fabrication, and testing of cask trunnions is incorrect. NUREG-0612 provides guidance for the control of heavy loads at nuclear power plants. The FSRP should recognize that NUREG-0612 clearly preempts ANSI N14.6 standards. The ANSI N14.6 Committee has agreed that the standard was not intended to be applied to interfacing lift points. It appears, therefore, that technically-based guidance for trunnions still does not exist. This results in the potential for a case-by-case licensing approach that creates uncertainty for the applicant and inconsistent results." These NUREGs should not be finalized until the technical issues have been resolved.

We appreciate this opportunity to comment on the draft "Standard Review Plan for Spent Fuel Dry Storage Facilities," NUREG-1567. If you would like to discuss our comments further, please contact me at (202) 739-8110 or by e-mail (apn@nei.org).

Sincerely,



Alan P. Nelson

APN/tnb  
Enclosure

## GENERAL COMMENTS

**Commentator:** NEI

**Summary of Issue:**

Recognize in the FSRP that an intermittent use-pool for fuel transfers may be an economic choice.

**Chapter:** General

**Section:**

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X

**Addition**

**Grammatical Error**

**Inconsistency**

**Clarification**

**Comment:**

It is not reasonable to not recognize the necessity to provide for repackaging of fuel at an ISFSI. It is also not reasonable to maintain a pool in active status when it is not used. Therefore, the FSRP should acknowledge the possibility of creating a simplified transfer pit that is flooded only when the pit is used (needed).

**Bases for Comment:**

The wet pool is projected to be expensive to maintain and also needs a lot of equipment to maintain the temperature. If a pool is only envisioned for use for transfer operations (not storage) then the size and operations are greatly simplified because of the short time it is needed. For example, a transfer pool need only be large enough to accommodate two casks and only need to be flooded for two or three days during usage after which it would be drained. For this use no active cooling would be necessary. Facility costs could be controlled without loss of safety.

**Suggested Revision/Replacement Language**



**Commentator:** NEI

**Summary of Issue:**

The FSRP does not clearly indicate the differences for reviewing an ISFSI specific license application for an ISFSI away from a reactor site and an ISFSI collocated on a reactor site.

**Chapter:**

**Section:**

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:** X

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

Much of the information needed to be submitted for an ISFSI specific license application for an ISFSI to be located away from a reactor site would need be much more detailed than what would be necessary for an application for an ISFSI to be collocated on a reactor site. The FSRP does not clearly distinguish how these two different types of ISFSI applications would be reviewed.

**Bases for Comment:**

Much of the information needed to be submitted for an ISFSI specific license application for an ISFSI to be located away from a reactor site should be much more detailed than what would be necessary for an application for an ISFSI to be collocated on a reactor site. The FSRP does not clearly distinguish how these two different types of ISFSI applications would be reviewed.

**Suggested Revision/Replacement Language:**

Revise the FSRP to indicate the different review approaches for proposed ISFSIs to be located away from a reactor site and ISFSIs to be collocated on a reactor site.

**Commentator:** NEI

**Summary of Issue:**

The FSRP does not provide review guidance on all documents that should be included in a specific license application for a dry-type ISFSI.

**Chapter:** General

**Section:**

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:** X

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

No specific guidance is provided for reviewing the license application, the proposed license conditions, and the training and certification program.

**Bases for Comment:**

Regulatory Guide 3.50 provides format and content guidance for a license application to store spent fuel. Although the license application mostly summarizes and references the license application enclosures, it does contain unique information that addresses specific regulatory requirements (e.g., 10 CFR 72.24) as well as commitments. The FSRP does not discuss the review of the license application.

As stated in Regulatory Guide 3.50, proposed license conditions are divided into two broad categories: (1) administrative and management organization and controls and (2) technical specifications. FSRP Section 14 discusses the review of the technical specifications, but the FSRP does not discuss the review of other proposed license conditions.

10 CFR 72.192 requires that the operator training and certification program be submitted with the license application. FSRP Sections 13.4.3 and 13.5.3 discuss the review of the SAR section that describes/summarizes the training program, but the FSRP does not describe how the actual, stand-alone training and certification program is reviewed.

**Suggested Revision/Replacement Language:**

Add guidance to the FSRP for reviewing the license application, the proposed license conditions, and the training and certification program.

**Commentator:** NEI

**Summary of Issue:**

The FSRP does not reflect the correct revision of Regulatory Guide 3.48.

**Chapter:** General

**Section:**

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:** X

**Clarification:**

**Comment:**

In the FSRP, the reference citations to Regulatory Guide 3.48 indicate that the document was prepared in October 1981. The FSRP does not recognize that Regulatory Guide 3.48 was revised in August 1989.

**Bases for Comment:**

In the FSRP, some of the referenced material from Regulatory Guide 3.48 is incorrect since the material was changed in the revision to Regulatory Guide 3.48.

**Suggested Revision/Replacement Language:**

Change all references to Regulatory Guide 3.48 to indicate that the current version is Revision 1 dated August 1989. Review FSRP information based on Regulatory Guide 3.48 to ensure it is current.

**Commentator:** NEI

**Summary of Issue:**

The FSRP contains application content guidance beyond that in the related format and content regulatory guides.

**Chapter:** General

**Section:**

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

The FSRP recognizes that some of the subsections in Regulatory Guide 3.48 could be improved and has included these subsections as stand-alone sections in the FSRP. Also, in many instances, the FSRP provides additional content guidance not included in Regulatory Guide 3.48. It would seem more appropriate to have only one document that defines format and content guidance.

**Bases for Comment:**

Providing applicants with a better understanding of what is expected to be included in an ISFSI license application would improve the quality of license applications.

**Suggested Revision/Replacement Language:**

Either (1) remove format and content guidance from the FSRP and include it in the appropriate, updated regulatory guides or (2) incorporate all format and content guidance from appropriate regulatory guides into the FSRP.

## GLOSSARY

**Commentator:** NEI

**Summary of Issue:**

The FSRP Glossary contains definitions that are not consistent with regulatory definitions and also includes terms that are not related to ISFSIs.

**Chapter:** Glossary

**Section:**

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:** X

**Clarification:**

**Comment:**

The terms "controlled area," "design bases," and "ISFSI" are defined differently in the FSRP than in 10 CFR 72.3, Definitions. Also it is not clear why the FSRP glossary only includes a few terms from 10 CFR 72.3.

The term "controlled area" is defined in the same manner as "restricted area"; however, the 10 CFR 20 definitions of these terms indicate that they are different. (Note: The definition of "controlled area" is different in 10 CFR 20 than in 10 CFR 72.)

Additionally, it is not clear why the terms "nonsafety-related electrical equipment" and "safety-related electrical equipment" are included in the FSRP glossary when the term "safety-related" is not used in 10 CFR 72. (Note: the term "safety-related" should not be used in the FSRP; the current version of the FSRP uses this term.)

**Bases for Comment:**

The use of consistent terminology by the NRC and the applicant is essential to ensure that the desired application contents are communicated properly. Regarding the term "safety-related," this term has specific meaning in the nuclear power plant arena but not in the ISFSI arena.

**Suggested Revision/Replacement Language:**

Revise the glossary to ensure appropriate terms are included and defined properly.



**Commentator:** NEI

**Summary of Issue:**

**Chapter:** Glossary

**Section:**

**Paragraph:** p. xxx

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:** X

**Comment:**

"10 CFR 20 Volume %. The percentage of a mole of the material that is present in a volume that is equal to the standard volume for the material as a gas."

**Bases for Comment:**

Does not make any sense.

**Suggested Revision/Replacement Language:**

## INTRODUCTION

**Commentator:** NEI

### Summary of Issue:

Licensee referencing existing documentation.

**Chapter:** Introduction    **Section:** FSRP Purpose & Scope    **Paragraph:** p. 1

**Type of Issue:** Please select one of the following categories:

Suggestion: X	Addition:	Grammatical Error:

<b>Inconsistency:</b>	<b>Clarification:</b>
-----------------------	-----------------------

**Comment:**

In this section and throughout the SRP not enough emphasis is placed on the licensee replacing existing documentation per 10 CFR 72.18 rather than repeating work that has already been done.

### Bases for Comment:

**Suggested Revision/Replacement Language:**

"It is understood that throughout this SRP, the applicant may cite various documents such as it's FSAR, Tech Specs and previously accepted documents and studies in lieu of repeating the work per the intention of 10 CFR 72.18."

## Chapters 1, 3, and 8

Commentator: NEI

### Summary of Issue:

Licensed lifetime

**Chapter:** 1      **Section:** FSRP Purpose    **Paragraph:** 2nd  
                             & Scope

Chapter: 3                      Section: Table 3-1

**Type of Issue:** Please select one of the following categories:

Suggestion:                      Addition:                      Grammatical Error:  
Inconsistency: X              Clarification:

**Comment:**

Chapter 1 states that the FSRP is for use by NRC staff reviewers of a license applications and renewals\*. Table 3-1 states that the license is restricted to 20 years. The license renewal is also noted in the last paragraph of Chapter 1, Section 1.4.2

### Bases for Comment:

A restriction to 20 years implies that a renewal is not possible.

**Suggested Revision/Replacement Language:**

Change Table 3-1 to read "Initial license is restricted to 20 years, with potential renewals)."

**Commentator:** NEI

**Summary of Issue:**

Fuel cooling period prior to storage.

**Chapter:** 1                      **Section:** 1.3                      **Paragraph:** 12.2

**Chapter:** 8                      **Section:** 8.5.1.2                      **Paragraph:** 1st

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

In Section 1.3 the criteria is fuel that is cooled ("aged") for at least one year, yet in Chapter 8 the only temperature limit listed is for 5 years and 10 years cooled fuel.

**Bases for Comment:**

The NRC accepted zircalloy fuel-cladding temperature for one year cooled fuel is not listed. When a reactor is shutdown it is most economic (generally) to empty the SFP as soon as possible. By stating the one year limit the possibility of partly loading a cask (to keep the total heat load within limits) could be evaluated.

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

### Summary of Issue:

Chapter: 1      Section: just above      Paragraph: p. 4  
1.4.3

**Chapter: 8**                      **Section: 8.5.1.2**                      **Paragraph: 1st**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The first sentence construction make the intent unclear.

### Bases for Comment:

Although the ISFSI project is the impetus for crane upgrades the actual work on the crane should not be considered under this 10 CFR 72.40(b) restriction since it is also an improvement for refueling operations with or without the dry storage project.

**Suggested Revision/Replacement Language:**

"Initiation of modification of existing facilities for incorporation as ISFSI or MRS SSCs subject to NRC approval under 10CFR72 may be grounds for denial of license. . ."



## CHAPTER 2

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 2

**Section:** 2.3

**Paragraph:** p. 2.3, line 2

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

Change "ISFSI" to "MRS"

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

The FSRP does not elaborate on the need for new information for facilities covered under previous licensing actions.

**Chapter:** 2

**Section:** 2.4

**Paragraph:** various

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:** X

**Comment:**

There is a requirement in 10 CFR 72.40 C) for facilities that have been covered under previous licensing actions to reevaluate the site "where new information is discovered ..." As written, the subsections of FSRP Section 2.4 address the information needed but do not address criteria that would require reevaluation of the site.

**Bases for Comment:**

Developers of ISFSI/MRS license applications at reactor sites need to have a clearer understanding of NRC's expectations for satisfying 10 CFR 72.40(c).

**Suggested Revision/Replacement Language:**

Clarify the subsections of FSRP Section 2.4 to identify what attributes of the required information would need to be new such that a site reevaluation would have to be performed.

**Commentator:** NEI

**Summary of Issue:**

The FSRP does not identify acceptable methods for evaluating potential site proximity hazards.

**Chapter:** 2                      **Section:** 2.4.2, 2.5.2      **Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:** X                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

Neither Section 2.4.2 nor Section 2.5.2 indicate the methods acceptable to the NRC for evaluating potential site proximity hazards, such as an airplane crash.

**Bases for Comment:**

The FSRP should identify NRC's expectations for acceptable approaches for such evaluations. It is likely that numerous examples of acceptable approaches exist based on NRC's years of experience with reviewing such hazards for reactor sites as well as ISFSI sites.

**Suggested Revision/Replacement Language:**

Provide references to NRC guidance on acceptable methods for evaluating site proximity.

**Commentator:** NEI

**Summary of Issue:**

The draft FSRP does not fully reflect the seismic requirements of the recently amended 10 CFR 100.

**Chapter:** 2                      **Section:** 2.4.6, 2.5.6                      **Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:** X                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

The FSRP's Acceptance Criteria and Review Procedures for site geology and seismology do not reflect the geologic and seismic siting criteria added to 10 CFR 100 as section 100.23, effective January 10, 1997.

**Bases for Comment:**

Historically, there has been a linkage between reactor and ISFSI geologic and seismic siting criteria and methods through the reference in 10 CFR 72.102 to appendix A of part 100, particularly in the use of deterministic methods to define the safe shutdown earthquake or design earthquake (DE) for sites west of the Rocky Mountains. Effective January 10, 1997, the amended part 100 also allows the use of probabilistic methods in the determination of the safe shutdown earthquake.

**Suggested Revision/Replacement Language:**

Add to the FSRP acceptance criteria and review procedures to accommodate the geologic and seismic siting criteria of 10 CFR 100.23.

## **CHAPTER 3**

**Commentator:** NEI

**Summary of Issue:**

Repetitive information.

**Chapter:** 3

**Section:** general    **Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

Most of the information in Chapter 3 is used in other chapters.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

To what extent can there be referencing to avoid having to repeat information?



**Commentator:** NEI

**Summary of Issue:**

The applicability of 10 CFR 72.122(h)(2) to a dry storage facility needs to be clarified.

**Chapter:** 3, App. A      **Section:** 3.3      **Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

10 CFR 72.122(h)(2) is not listed as an applicable requirement in FSRP Section 3.3 and is shown as NA in Appendix A, page A-45.

**Bases for Comment:**

A dry storage ISFSI design could include a pool for the handling and temporary storage of spent fuel. For such a design, the FSRP does not provide NRC's expectations for water clarity and level control.

**Suggested Revision/Replacement Language:**

Clarify the FSRP by stating whether or not 10 CFR 72.122(h)(2) applies to the short-term storage of spent fuel underwater during cask unloading.

**Commentator:** NEI

**Summary of Issue:**

Unclear requirement

**Chapter:** 3

**Section:** 3.4.1

**Paragraph:** Spent Fuel

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:** X

**Comment:**

The data that is needed for fuel to be stored includes "history and census." It is not clear what historical data should be retained/provided, nor is it clear what grouping of data is acceptable.

**Bases for Comment:**

History can mean the discharge exposure or the exposure at the end of each cycle or other information such as the average void level. The census of the data could be grouped by exposure to the nearest MWD/ST, to the nearest 5 MWD/ST, or other exposure interval. The need for data is recognized, but clarification is needed.

**Suggested Revision/Replacement Language:**

Specify that the data is to be "Assembly final discharge exposures grouped by intervals of 2 GWD/ST. The census expected in each interval is to be provided."

**Commentator:** NEI

**Summary of Issue:**

"Acceptable Response for Normal Condition Maximum"

**Chapter:** 3                      **Section:** 3.4.3.1                      **Paragraph:** p. 3-9

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The NRC assumes that fuel rods degrade in storage.

**Bases for Comment:**

The assumption is narrowly defined in 11.4.1.1 as the release of fission and fill gases. Does this mean that an applicant does not have to address fuel degradation over the storage period?

**Suggested Revision/Replacement Language:**

The NRC should be more explicit about its permitted assumptions on fuel degradation.

**Commentator:** NEI

**Summary of Issue:**

Clarification of the terminology "non-mechanistic, but credible".

**Chapter:** 3                      **Section:** 3.4.3.1      **Paragraph:** p. 3-10

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

Cask tipover is cited as an example of a "non-mechanistic," but credible event. Clarify that this non-mechanistic event is intended to provide bounding conditions for a wide variety of less severe credible events.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Replace sentence by "The NRC requires analysis of affected SSCs for some events (e.g., cask tipover) that are not credible, but which provide bounding physical conditions for a wide variety of credible accidents."

**Commentator:** NEI

**Summary of Issue:**

"Errors in accounting and loading material"

**Chapter:** 3                      **Section:** 3.4.3.5                      **Paragraph:** 1st bullet

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The new fuel assumption for criticality analysis is supposed to encompass any such errors.

**Bases for Comment:**

Is there something in this bullet that suggests more than the fuel assumption?

**Suggested Revision/Replacement Language:**

The FSRP should be more explicit.



**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 3                      **Section:** 3.4.1                      **Paragraph:** p. 3-6, line 5

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

After "fuel physical characteristics" add "including fuel enrichment and burnup (MWD/MTU)."

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

Fuel data is not very detailed.

**Chapter:** 3

**Section:** 3.4.1

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:** X

**Comment:**

The spent fuel data listing is not very detailed.

**Bases for Comment:**

For example, under "thermal characteristics" what units? Peak or average, or both? Is the decay heat profile required? How is the population of the fuel at the site to be characterized, or is just the maximum assembly described?

**Suggested Revision/Replacement Language:**

Provide sufficient data.

**Commentator:** NEI

**Summary of Issue:**

The FSRP does not provide sufficient insights on classifying structures.

**Chapter:** 3

**Section:** 3.4.2

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:** X

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

There are a number of questions on classifying SSCs that the FSRP does not answer. These questions are provided below. Additionally, FSRP Section 3.4.2 should reference FSRP Sections 4.5.4 and 7.4.1 since these sections provide insights and examples on classifying SSCs.

- How does the definition of important to safety relate to the "basic nuclear safety criteria" (what is the basis for these safety criteria)?
- How should SSCs not intended to perform a safety function but whose failure could impair the capability of other SSCs from performing their intended safety function be classified?
- Are there expectations for further classifying SSCs that have been determined to be not important to safety?
- How can SSCs important to safety be considered as Classification Category C-Minor Impact on Safety (as defined in NUREG/CR-6407)?

**Bases for Comment:**

10 CFR 72 requirements, particularly the QA requirements, are focused on items that are important to safety. Therefore, it is essential to understand the basis for determining an item is important to safety.

The FSRP reference to NUREG/CR-6407 further leads to confusion. For instance, NUREG/CR-6407, Table 6, lists many SSCs, such as the concrete support pad and security lockwire and seals, as important to safety that have not been classified as such in NRC-approved license applications.

**Suggested Revision/Replacement Language:**

Clarify the acceptance criteria and guidance on classifying SSCs.

**Commentator:** NEI

**Summary of Issue:**

The FSRP references a document that indicates that records of Category C components do not need to be maintained although the regulatory requirements indicate otherwise.

**Chapter:** 3

**Section:** 3.4.2.2

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:** X

**Clarification:**

**Comment:**

The FSRP indicates that QA records retention requirements for the classification of categories of components can be found in NUREG/CR-6407. For category C components, NUREG/CR-6407 states that QA records are not required to be maintained. 10 CFR 72.174, QA Records, states "Records pertaining to the design, fabrication, erection, testing, maintenance, and use of structures, systems, and components important to safety shall be maintained by or under the control of the licensee until the Commission terminates the license."

**Bases for Comment:**

NUREG/CR-6407 provides a method for categorizing important to safety items into one of three Classification Categories:

Category A - Critical to safety operation

Category B - Major impact on safety

Category C - Minor impact on safety

However, regardless of the category of the item, it remains important to safety and the requirements of 10 CFR 72.174 apply.

**Suggested Revision/Replacement Language:**

Resolve the inconsistency between NUREG/CR-6407 and 10 CFR 72.174 regarding QA records retention requirements.

**Commentator:** NEI

**Summary of Issue:**

Recognize NUREG/CR 6407

**Chapter:** 3

**Section:** 3.4.2.2

**Paragraph:** p. 3-8

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:** X

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

FSRP should recognize that NUREG/CR-6407 specifies three safety categories, but safety classification Category C seems to have a Not-Important-To-Safety Definition.

**Bases for Comment:**

There is a need for clarifications as to how the NRC will review SCC's based on the Safety Classification (i.e., A, B, or C)

**Suggested Revision/Replacement Language:**

## CHAPTER 4

**Commentator:** NEI

**Summary of Issue:**

Repeated word

**Chapter:** 4

**Section:** 4.4.2

**Paragraph:** 1st bullet, top of  
page 4-6

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:** X

**Inconsistency:**

**Clarification:**

**Comment:**

Remove un-needed words "a over".

**Bases for Comment:**

Incorrect wording

**Suggested Revision/Replacement Language:**

Remove "a over" from sentence. . . a crane operating over a over the pool. . .

**Commentator:** NEI

**Summary of Issue:**

The FSRP does not cite appropriate references for SAR content guidance when water basins are used for receipt or storage cask loading operations at a dry-type ISFSI.

**Chapter:** 4

**Section:** 4.4.3, 4.5.3

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:** X

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

FSRP Sections 4.4.3 and 4.5.3 on pool and pool facility systems do not provide appropriate references to Regulatory Guide 3.44. Note, also, that the cited reference, Regulatory Guide 3.48, does not clearly indicate the expected SAR content if the ISFSI uses a water basin for receipt or storage cask loading operations.

**Bases for Comment:**

Regulatory Guide 3.44 was developed to provide SAR format and content guidance for a water-basin type ISFSI that is not collocated with another nuclear facility. Regulatory Guide 3.48 indicates that Regulatory Guide 3.44 could be used to provide guidance if the dry-type ISFSI uses a water basin for the receipt or storage cask loading operations; however, Regulatory Guide 3.48 does not provide specific guidance on what parts of Regulatory Guide 3.44 to use.

**Suggested Revision/Replacement Language:**

Add appropriate references to Regulatory Guide 3.44 in the FSRP sections on pools and pool facility systems.

## CHAPTER 5

**Commentator:** NEI

**Summary of Issue:**

FSRP Section 5

**Chapter:** 5

**Section:** 5.4.2

**Paragraph:** p. 5-4, 2nd bullet

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:** X

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

This FSRP section does not list hydrogen gas controls as an area of special concern.

**Bases for Comment:**

Hydrogen gas controls are discussed in later sections of the FSRP. However, introducing the topic in Section 5.4.2 and referencing the later sections would emphasize the importance of the subject, especially in the case of failed fuel and in light of the experience at Point Beach.

**Suggested Revision/Replacement Language:**

Add a fourth bullet to the listing in Section 5.4.2 discussing hydrogen gas controls.



**Commentator:** NEI

**Summary of Issue:**

The FSRP does not identify acceptable methods for hazards analysis.

**Chapter:** 5

**Section:** 5.4.2

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:** X

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

FSRP Section 5.4.2 encourages the use of recognized methods for hazard identification and classification. However, examples and citations of such recognized methodologies are not provided.

**Bases for Comment:**

The FSRP should clearly identify NRC's expectations for acceptable approaches for meeting this requirement. It is likely that precedents exist in approved license applications and that acceptable published and draft guidance (e.g., draft NUREG-1513) exist, too. Also, the five areas discussed in Section 5.4.2 appear illustrative and not exhaustive.

**Suggested Revision/Replacement Language:**

Add examples and/or citations of recognized hazard identification and classification methodologies to FSRP Section 5.4.2.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 5

**Section:** 5.5.1

**Paragraph:** p. 5-6

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

Procedure L5.2 requires the use of "materials, . . . that preclude the possibility of generation of hydrogen, oxygen and/or other gas. . ." This statement is too restrictive since small amounts of hydrogen are generated even during routine oxidation process.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Change to: ". . .preclude the possibility of excessive generation and accumulation of hydrogen, oxygen, and/or other gas in quantities that may potentially result in explosive conditions during confinement container sealing or opening operations.

## CHAPTER 6

**Commentator:** NEI

**Summary of Issue:**

Systems already approved.

**Chapter:** 6                      **Section:** General              **Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

No further analysis should be required where the radwaste, ventilation and other systems are likely to be those already approved and in use by the utility no further analysis seems to be required.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Only a caparison of existing capability to new demands should be required. Or in the alternative, a supplemental analysis should be presented if the dry storage system exceeds the design basis. Recognizing a new facility will require a ground-up evaluation.

**Commentator:** NEI

**Summary of Issue:**

Packaging documentation requirements are too prescriptive and inflexible.

**Chapter:** 6                      **Section:** 6.5.4.5                      **Paragraph:** 2

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

Applicant should be required to commit in the SAR to use packages that meet transportation regulations (if ultimately for transport), 10 CFR Part 61 stability requirements (if appropriate), and disposal site license conditions, a catalog listing of specific containers is not needed.

**Bases for Comment:**

Commitment to applicable regulatory requirements through procedural compliance is preferable to prescriptive package documentation requirements. To require that references to catalog listings of vender packages be continuously updated in revisions to the SAR creates an unnecessary burden upon the licensee with no commensurate improvement in public health and safety.

**Suggested Revision/Replacement Language:**

The SAR should describe the procedural controls that will ensure that waste materials are packaged to maintain safe storage; to meet transportation requirements, if appropriate; to meet 10 CFR Part 61 stability requirements, if applicable; and to meet all applicable disposal site license conditions.

## Chapter 7

**Commentator:** NEI

### **Summary of Issue:**

The FSRP does not address confinement acceptance criteria and design requirements for the storage of severely failed fuel.

**Chapter:** 7, 11, App. A   **Section:** 7.4, 7.5,   **Paragraph:** various  
11.4, 11.5

**Type of Issue:** Please select one of the following categories:

<b>Suggestion:</b>	<b>Addition:</b>	<b>Grammatical Error:</b>
<b>Inconsistency:</b>	<b>Clarification:</b>	

### **Comment:**

Except for sections 11.4.1.1 and 11.4.4.2, the FSRP only addresses confinement acceptance criteria and design requirements for storage of intact fuel. For example, in section 11.4.4.2 encapsulation of failed fuel is mentioned but no further reference is made to acceptable design standards for such encapsulation.

### **Bases for Comment:**

One current license application from the Department of Energy (i.e., the ISFSI for TMI-2 fuel) is for storage of severely failed fuel and rubble. It is possible that future license applications by DOE and commercial utilities may also require review by NRC of designs to store severely failed fuel.

### **Suggested Revision/Replacement Language:**

Expand the list of illustrative confinement structures, systems, and components (SSCs) in section 7.4.1.2 to include examples of those that would be necessary in the case of severely failed fuel. Add acceptance criteria, review procedures, and design requirements, as appropriate, to sections 7.4.2, 7.5.2, 11.4, 11.5, and Appendix A for confinement SSCs for severely failed fuel.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7

**Section:** 7.4.2.1

**Paragraph:** p. 7-12, 1st line

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

The statement that "this does not require that all confinement systems and other structures important to safety survive all design basis accidents and extreme nature phenomena without any permanent deformation or damage," is welcome. The word "nature" should perhaps be changed to "natural."

**Bases for Comment:**

Conventional terminology

**Suggested Revision/Replacement Language:**

Replace "nature" with "natural"



**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.1                      **Paragraph:** p. 7-12,  
2nd bullet

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The "evidence" that the cask storage pads and areas have been designed to adequately support the static load of the stored casks could be clarified.

**Bases for Comment:**

Clarification of intent and scope of evidence.

**Suggested Revision/Replacement Language:**

"evidence, such as satisfaction of ACI requirements, that the cask storage pads. . ."



**Commentator:** NEI

**Summary of Issue:**

The response time to events should be stated.

<b>Chapter:</b> 7	<b>Section:</b> 7.4.2.2	<b>Paragraph:</b> "Materials"
<b>Chapter:</b> 8	<b>Section:</b> 8.5.1.3	<b>Paragraph:</b> "Extreme Low Temperatures"

**Type of Issue:** Please select one of the following categories:

<b>Suggestion:</b>	<b>Addition:</b> X	<b>Grammatical Error:</b>
<b>Inconsistency:</b>	<b>Clarification:</b>	

**Comment:**

If routine transfer operations are conducted, the temperature of the limiting metal (not the ambient air) should preclude brittle fracture. It is possible that transfer operations due to a defective storage unit may be needed at very low temperatures. The construction of a replacement unit may not be possible in cold temperatures. Acceptable time frames should be considered.

**Bases for Comment:**

Response time for cask defect corrections may be longer in severely cold temperature periods. It is not economically prudent to have extra units on "standby," so a longer response is suggested.

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.2                      **Paragraph:** 3rd, p. 7-13

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

Paragraph beginning with "spent fuel cladding. . ." is confusing. The fuel "structural integrity" might be compromised by accelerations from accident-level conditions, but would not cause gross rupture of the cladding. Care should be used with these two terms. "Gross rupture" is a relative term and implies that other forms of rupture (?) are acceptable.

**Bases for Comment:**

Potential misunderstanding

**Suggested Revision/Replacement Language:**

Change the words "damage its structural integrity" to "damage that would lead to cladding failure." Define what is meant by "gross rupture."

**Commentator:** NEI

**Summary of Issue:**

Prevention of gross rupture.

**Chapter:** 7                      **Section:** 7.4.2.2                      **Paragraph:** p. 7-13

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

There is a reference to the prevention of gross rupture to spent fuel cladding. Accelerations that might lead to gross damage are to be avoided.

**Bases for Comment:**

This implies that the applicant must perform an assessment of fuel behavior under various accelerations to determine a gross failure limit.

**Suggested Revision/Replacement Language:**

Be explicit.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.2                      **Paragraph:** p. 7-13

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

Note the sentence "A tip-over or drop is always to be assessed as a bounding condition during handling operation." We concur, but the bounding condition could be incredible.

**Bases for Comment:**

Some handling operations could be so robust that such a bounding condition would be incredible.

**Suggested Revision/Replacement Language:**

Consider "...to be assessed as a bounding, but perhaps incredible condition during handling operations."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.2                      **Paragraph:** 4th, p. 7-14

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:** X                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

The reference to Reg. Guides 7.11 and 7.12 as acceptable bases for determining the potential for brittle fracture should also refer to the ASME Code Section II, Appendix G, and other ASME Code Section III requirements. Reg. Guides 7.11 and 7.12 are based on a methodology that applies to only a very limited range of materials.

**Bases for Comment:**

Limitations of Applicable Codes and Standards.

**Suggested Revision/Replacement Language:**

See above.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.2                      **Paragraph:** 1st, p. 7-15

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:** X                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

The discussion of "the potential for brittle fracture" is the place to refer to existing ASME Code Section III requirements for evaluating brittle fracture, such as the non-mandatory Appendix G.

**Bases for Comment:**

Additional guidance for applicant.

**Suggested Revision/Replacement Language:**

"The potential for brittle fracture must be reviewed, using such methods as those in Reg. Guides 7.11 and 7.12, or those given in the ASME Code Section III."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.2                      **Paragraph:** 4th, p. 7-15

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:** X                      **Clarification:**

**Comment:**

The sentence "Testing of weld integrity may be by a combination of . . . but some volumetric inspection (e.g. ultrasonic (UT)) may be necessary." is awkward since RT and UT are both volumetric inspection procedures.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

"Weld integrity may be tested by a combination of ASME-Approved weld test techniques, such as a combination of volumetric examination methods (e.g., radiographic (RT) and ultrasonic (UT))."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.2                      **Paragraph:** p. 7-15, 16

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The "off-normal" conditions defined under Load Conditions could correspond to either the ASME Code definition of Level B Service Conditions (expected and occurring with some frequency) or Level C Service Conditions (expected, but seldom occurring). In the former case, the statement "no permanent deformation or degradation" is valid. In the latter case, it is not.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Replace the last paragraph by the following:

"The NRC recognizes an additional set of conditions: "off-normal." These involve situations other than normal conditions or events that may be reasonably expected to occur with some moderate frequency during the life and use of the system." Similar change on p. 7-16, paragraph entitled "Off-Normal Conditions."



**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.3                      **Paragraph:** p. 7-16

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The paragraph under "Accident-Level Conditions" is confusing. What is meant here? If the paragraph

**Bases for Comment:**

Possible misinterpretation.

**Suggested Revision/Replacement Language:**

Make use of Appendix F criteria for allowable stresses under faulted conditions.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.3                      **Paragraph:** p. 7-17

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

The SRP seems to require an evaluation of potential casks drops under a variety of handling conditions and locations. Then, each of these drop events is to be analyzed separately, with stresses compared to allowables, or a demonstration is required that a particular drop event is bounded by some other accident-level conditions. The SRP states that "The SAR should include proof that the worst drop cases have been examined." Does this proof include probabilistic considerations, or must the demonstration be entirely deterministic?

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

We suggest that the proof be deterministic, but qualitative.

**Commentator:** NEI

**Summary of Issue:**

Allow credit for reasonable precautions against an event.

**Chapter:** 7                      **Section:** 7.4.2.3      **Paragraph:** p. 7-17, 2nd  
paragraph under "Cask Drop"

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

The design basis drop is stated to be the maximum height to which the cask could be lifted. The worst drop is not the lift, but rather the maximum height above the impact surface. When the maximum height is considered it should be the height when lifted/controlled with a non-single, failure proof crane is used.

**Bases for Comment:**

The maximum height (drop distance) is very likely to be when the loaded confinement cask is lowered from the refueling floor to the ground level. That lowering is often performed with a single-failure-proof crane that has just been inspected. That lowering is a one-time event for a cask, and due to the crane used, should not be a design basis drop.

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.3                      **Paragraph:** p. 7-17, 18

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

We support the position that the horizontal drop from a justified height is a reasonable substitute for the cask tip-over event.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

EPRI intends to provide analytical guidance to applicants to support both the tip-over and the substitution of the horizontal drop as equivalent events. This will be included in the upcoming addendum to report EPRI NP-7551.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.3                      **Paragraph:** p. 7-18

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

With the exception of potential air-gaseous fuel detonation from transfer vehicle hazards, the 10CFR50 explosion evaluations can be referenced in the application. Therefore, the third of the four bullets represents the unique threat to spent fuel dry storage facilities.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

"The maximum response, which could be attributable to an existing 10CFR Part 50 evaluation, should be determined and should be shown in the SAR documentation."

**Commentator:** NEI

**Summary of Issue:**

The FSRP should reflect the design basis tornado criteria recently approved for advanced light water reactors.

**Chapter:** 7                      **Section:** 7.4.2.3      **Paragraph:** 7-19

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:** X                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

Under "Tornado Winds," reference is made to the tornado parameters in Regulatory Guide 1.76. The reference should be updated to reflect the tornado parameters listed in Section 2.3 of NUREG-1503, Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design.

**Bases for Comment:**

The tornado parameters in NUREG-1503 update the Regulatory Guide 1.76 tornado parameters based on the updated tornado data and analysis presented in NUREG/CR-4461, Tornado Climatology of the Contiguous United States. These parameters were developed after the Commission approved the reduced maximum tornado wind speed of 300 miles per hour for the design basis tornado for advanced light water reactors (see staff requirements memorandum dated 7/21/93, "SECY-93-087 - Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs").

**Suggested Revision/Replacement Language:**

Revise the FSRP to reference the tornado parameters in NUREG-1503.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.3                      **Paragraph:** p. 7-19

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:** X                      **Clarification:**

**Comment:**

The SRP states that since the tip-over event is separately evaluated, there is no need to consider the simultaneous consequences to tip-over and tornado events. Yet, the next paragraph, on tornado missiles, cites a requirement to evaluate tornado missile effects that may cause a tip-over event. These two sentences are inconsistent.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Change sentence to read "Missile effects that should be addressed are those that may cause physical damage by impact, excluding tip-over, since this event is evaluated separately."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7      **Section:** 7.4.2.3      **Paragraph:** p. 7-20  
Finite-Element Analysis

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X      **Addition:**      **Grammatical Error:**

**Inconsistency:**      **Clarification:**

**Comment:**

Direct references to existing proprietary, commercial software, such as the references to ANSYS and NIDE3D-A, are inappropriate in the SRP, since the capability of the analyst is much more important than the capability of the software. Direct references to SCANS and CASKS are acceptable, since these codes are not commercial and have limited capability.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Eliminate direct (named) references to proprietary, commercial software.



**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.3                      **Paragraph:** p. 7-20  
"Earthquakes"

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The SRP should be more explicit about the nature of the design-basis earthquake. The implication, by reference to 10CFR72.102, is that the design-basis earthquake is equivalent to the safe-shutdown earthquake (SSE) for the site. Is the reason for the implied reference to 10CFR72.102 that the facility may not be located at a site with a defined SSE? This is unlikely.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

We suggest a direct reference to the SSE for the site.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.3                      **Paragraph:** p. 7-21

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

The first paragraph on this page is out of place.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Move the first paragraph on this page to be the first paragraph in the subsection on "closed-form solutions."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** Trunnious      **Paragraph:** p. 7-22  
p. 7-26

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:** X      **Clarification:**

**Comment:**

NUREG-0612 addresses trunnious along with cranes and lifting devices. However, ANSI N14.6 only addresses lifting devices, not trunnious. Also, on p. 7-26 on trunnious testing, only N4.6 is cited for 150% and 300% load testing of trunnious. N14.6 does not apply to trunnious.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

This matter was raised in the NUREG-1536 review but has not been resolved. Load testing includes both initial as well as in service, and is contrary to the design of some storage casks.

Resolution seems appropriate.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.3                      **Paragraph:** p. 7-21,  
p. 7-22

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:** X                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

Any discussion of scale-model testing should mention the type of scaling to be used. For drop (impact) scale-model testing, "velocity" scaling is the normal method, such that velocities are 1:1, accelerations are increased by the scaling factor, displacements are reduced by the scaling factor, etc. Mass is smaller by the cub of the scaling factor. Duplicating or representing the receiving target hardness is extremely difficult. The surface hardness of the target is not particularly relevant, since the cask response depends on the total stiffness of the target.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Remove the reference to "surface" target hardness. Add a reference to velocity scaling as an acceptable procedure. Correct the spelling on John Stokely's name.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.3                      **Paragraph:** p. 7-23

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

The external pressure buckling charts of the ASME Code Section III (e.g., NB-3133) and the rules of Nuclear Code Case N-284 are not appropriate for internal fuel basket buckling evaluations. An acceptable approach is the application of the buckling rules in Appendix F of Section III for combined axial compression and bending of linear type component and piping supports (e.g., F-1334).

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

We suggest a direct reference to Appendix F of Section III, to keep applicants from using other rules in Section III that are not applicable.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.2.4                      **Paragraph:** p. 7-25

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

The second paragraph on this page is too prescriptive.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Consider "For confinement welds that cannot be completely examined volumetrically using RT, supplementary examination by UT methods is acceptable. The combination of volumetric examination methods should provide 100% coverage of the confinement welds." Similarly, in the fifth paragraph, consider "Portions of nonconfinement welds in the confinement SSVs that cannot be examined by RT methods should be examined by UT techniques, in accordance with the ASME Code, Section V, Article 5."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7      **Section:** 7.4.2.4      **Paragraph:** p. 7-26  
"Testing Ferritic Steel. . ."

**Type of Issue:** Please select one of the following categories:

**Suggestion:**      **Addition:**      **Grammatical Error:**

**Inconsistency:** X      **Clarification:**

**Comment:**

The ASME Code Section III requirements for ferritic steels are characterized incorrectly. The ASME B&PVC does require the determination of NDT by test (see NB-2331 (a) (1)), and then goes on to require minimum impact properties at  $T_{NDT} + 60^{\circ}\text{F}$ . NUREG/CR-1815 is based solely on the ultraconservative margin of lowest service temperature (LST)-TNDT. The ASME Code permits use of Ferric material in the transition region between lower-shelf and upper-shelf behavior, provided the impact energy is adequate.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

This paragraph must be rewritten to eliminate the mis-characterization of the ASME Code requirements. The first and second sentences are all right. The third sentence should read "The ASME B&PVC requires that the nil ductility transition (NDT) temperature be determined by test, with minimum impact energy requirements (impact energy and lateral expansion) at a temperature not greater than the NDT temperature plus  $60^{\circ}\text{F}$ ." Eliminate the reference to NUREG/CR-1815, since the characterization of its requirements is incorrect. The last sentence should state "If the ASME B&PVC is used to qualify materials subject to brittle fracture failure, then the minimum operating temperature for handling the cask must be NDT temperature plus  $100^{\circ}\text{F}$  (see NV2332 (c)), unless fracture mechanics justification, such as that in Appendix G, is provided."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7

**Section:** 7.4.3.2

**Paragraph:** p. 7-29

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:** X

**Comment:**

The second sub-bullet, "The fuel pool should be designed. . ." seems to say that if the crane is used to move heavy objectives in the pool area, then it should not be used in the vicinity of radioactive materials, i.e. the pool.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Rewrite the paragraph to make it clear.



**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.4.1                      **Paragraph:** p. 7-31

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:** X                      **Clarification:**

**Comment:**

The SRP clearly states that "RC structures are not required to survive an accident-level event" undamaged, provided suitable justification is provided to the NRC staff. Yet, the FSRP contains explicit requirements for precluding "interior spalling" from tornado missile, impact, even if the spalling is insignificant (requiring detection and remediation (repair?)). These statements are not consistent.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

"The design should preclude significant interior spalling unless practical means of detecting the situation and remedying it are proposed."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.4.2                      **Paragraph:** p. 7-31

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:** X

**Inconsistency:**                      **Clarification:**

**Comment:**

The forward reference to Section 8.4.1.1 of the SRF should be to Section 8.5.1.3 (Special Thermal Criteria for Reinforced Concrete).

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Change "These criteria are at FSRP Paragraph 8.4.1.1" to "These criteria are at FSRP Paragraph 8.5.1.3."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.4.3                      **Paragraph:** p. 7-34

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:** X                      **Clarification:**

**Comment:**

The FSRP states in the first paragraph of this section that "The NRC accepts strength design as presented in the current ACI 349. . ." In the third paragraph, the SRP states that "Structures important to safety are to have sufficient capability for every section to withstand the worst case normal and off-normal conditions without permanent deformation and with no degradation of capability to withstand any future loadings." These two statements are not consistent.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Strength design implies the RC structure retains ultimate capacity margin, but that individual cross sections may undergo permanent deformation. The second sentence should be rewritten as: "Structures important to safety are to have sufficient capability to withstand the worst case normal and off-normal conditions without loss of capability to withstand future design-basis loading."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.4.3                      **Paragraph:** p. 7-36

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

The material on this page is too prescriptive, and may mislead the designer into thinking that the ACI Code's philosophy for ductile design is not acceptable to NRC. Moreover, "ductile design" is a property of the structure, and can be achieved by using the proper balance between the concrete and the steel, not by legislating yield strength.

**Bases for Comment:**

The ACI Code provisions adequately describe the conditions needed to achieve ductile design.

**Suggested Revision/Replacement Language:**

Code type specification (e.g., limits on material properties, reinforcement ration, development length, etc.) should be removed. Since numerous references are made to the Code, which deals with ductile design, there is no reason to single out a few provisions that are not inclusive. The bullets should be replaced by material that specifies what should be reviewed, such as for example, the design acceptance criteria used to ensure ductile design, the ductility ratios achieved in the design, the failure modes, the method of design verification, etc.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 7                      **Section:** 7.4.5.3                      **Paragraph:** p. 7-38

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:** X                      **Clarification:**

**Comment:**

The second paragraph under the subsection "Load Conditions" states that "Structures important to safety are to have sufficient capability for every section to withstand the worst-case loads under normal and off-normal conditions such that no permanent deformation and no degradation of capability to withstand any future loadings occur." Yet strength design, which admits some form of permanent damage, is acceptable. This is not consistent.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Strike the words "for every section" and change the sentence to read "structures important to safety. . . conditions such that there is no loss of capability to withstand future design-basis loadings."

## CHAPTER 8

**Commentator:** NEI

**Summary of Issue:**

Grammatical error in word usage.

**Chapter:** 8

**Section:** 8.3

**Paragraph:** 2nd, p. 8-2

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:** X

**Inconsistency:**

**Clarification:**

**Comment:**

In first sentence replace "credibly" with "credible".

**Bases for Comment:**

Wording is incorrect as written.

**Suggested Revision/Replacement Language:**

Replace credibly with credible.

**Commentator:** NEI

**Summary of Issue:**

Possible inappropriate value.

**Chapter:** 8                      **Section:** 8.4, 8.5.2.3      **Paragraph:** item 10, p. 8-3

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:** X      **Clarification:**

**Comment:**

The limit of 140°F is/should be dependent on the stress in the concrete at the pool area, and is generally applicable to a reactor SFP, not an ISFSI pool.

**Bases for Comment:**

The allowed temperature difference should be dependent on the design of the pool (concrete properties, thickness, etc.). The 140° limit in the draft FSRP may not be appropriate. The basis for the limit should be listed.

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

Unclear cladding failure acceptance criteria

**Chapter:** 8

**Section:** 8.4

**Paragraph:** 4

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:** X

**Comment:**

The integral fracture rate (cask load through time to) is stated to be 0.5%.  
What is not stated is the time interval (20 year license or 40 year design life).

**Bases for Comment:**

If the failure rate is evaluated over 20 years the ISFSI license period per Section 1.6) then extensions of the license may be precluded. Unless the NRC recognizes an increase calculated failure rate is acceptable for extensions, the vagueness could cause very expensive changes at a later time.

**Suggested Revision/Replacement Language:**



**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 8      **Section:** 8.4      **Paragraph:** items 4 & 6, p. 8-3

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X      **Addition:**      **Grammatical Error:**

**Inconsistency:**      **Clarification:**

**Comment:**

It is not clear how the applicant should demonstrate failure probability?

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 8                      **Section:** 8.5.1.2                      **Paragraph:** 2

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:** X                      **Clarification:**

**Comment:**

The second paragraph tends to contradict the first. The paragraph references documents may not be correct for the particular fuel being stored.

**Bases for Comment:**

The first paragraph references seem to be the "standard" for the industry.

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 8                      **Section:** 8.4.8.5.1.2    **Paragraph:** p. 8-3, item 5  
p. 8-5

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**    X

**Comment:**

Creep cavitation of up to 15% (fifth item in the acceptance criteria, and on page 8-5), is not known to occur in zircaloy at the fluence levels typical of thermal reactors. The effect is much more pronounced in steel at fluence levels typical of fast reactors.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Evaluate this effect to see if it is realistic for LWRs, remove the requirement to not cause unnecessary evaluation work.

**Commentator:** NEI

**Summary of Issue:**

Fuel cladding

**Chapter:** 8

**Section:** 8.5.1.2

**Paragraph:** p. 8-5, 8-6

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

A fuel burnup of 35,000 MWD/MTU should not be represented as "very high", when evaluating temperature limits for fuel handling accident.

**Bases for Comment:**

Most fuel discharge burn-up values are above this number.

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 8

**Section:** 8.5.1.3

**Paragraph:** p. 8-6

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The alternative temperature requirements introduced in the NUREG are prudent and reflect good judgment. However, the exclusion of structures designed by ACI 359 is surprising since the difference between ACI 349 and LACI 359 is that the latter uses stress allowables where as the former accepts strength based design. Both must rely on the same material properties that are affected by temperature. Another consideration, is the role of creep at temperatures above 150°F. The Code treats creep as of secondary importance sine the general temperature is limited to 150°F. At 300°F the creep effect could not be ignored.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

1. Restore the consistency between ACE 349 and ACI 359 with regards to temperature.
2. Clarify the position with respect to creep for general concrete temperature of 300°F.

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 8

**Section:** 8.5.2.2

**Paragraph:** 2

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

Note subcooling margins must be maintained to prevent criticality. However, the criticality analysis requires evaluation at optimum moderation, even if that is a water vapor condition.

**Bases for Comment:**

There could be circumstances where local limited boiling might occur (e.g. reflooding).

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 8

**Section:** 8.5.4

**Paragraph:** 5th, p. 8-13

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

Direct reference to proprietary, commercial software should be avoided, such as the reference to ANSYS in the fifth paragraph. References to SCANS, CASKS, and HEATING are acceptable.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

Change sentence to "The NRC has accepted thermal computations of cask heat removal and associated temperatures by use of verified general purpose finite element and finite difference codes, including both proprietary and non-proprietary (e.g., the HEATING code)."

## CHAPTER 9

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 9                      **Section:** 9.3                      **Paragraph:** p. 9.4, line 31

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

Change "0.002 rem(0.mSv)" to 0.002 rem(0.02mSv)"

**Bases for Comment:**

**Suggested Revision/Replacement Language:**



**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 9

**Section:** 9.4.3.3

**Paragraph:** 3, p. 9-19

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**    X

**Inconsistency:**                      **Clarification:**

**Comment:**

Line 1 - change "SSC~~ss~~" to "SSCs"

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

Dose rates

**Chapter:** 9                      **Section:** 9.4.3.3                      **Paragraph:** 2, p. 9-21

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

Not sure what is being stated. Suggest the second sentence be deleted.

**Bases for Comment:**

The 0.002 rem/hr dose rate limit is for an unrestricted area and for protection of the public.

**Suggested Revision/Replacement Language:**

Regulation 10 CFR 20.1301(a)(2) states: "The dose in any unrestricted area from external sources does not exceed 0.002 rem (0.02mSv) in any one hour."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 9

**Section:** 9.5.6

**Paragraph:** 2, item 1

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:** X      **Grammatical Error:**

**Inconsistency:**                      **Clarification:**

**Comment:**

Add TEDE to the statement to confirm with 10 CFR 20.1301(a)(1).

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

"The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1mSv) in a year, exclusive of the dose contribution from the licensee for disposal of radioactive material into sanitary sewage in accordance with 20.2003, and . . ."

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 9

**Section:** 9.6

**Paragraph:** F9.7

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:** X

**Inconsistency:**                      **Clarification:**

**Comment:**

Replace "radioactive" with "radiation"

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

## CHAPTER 10

**Commentator:** NEI

**Summary of Issue:**

Assumption of unborated water.

**Chapter:** 10                      **Section:** 10.4.1.1                      **Paragraph:** p. 10-4, last  
bullet

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**  
**Inconsistency:**                      **Clarification:**

**Comment:**

The assumption of unborated water is probably good, but not for the stated reason.

**Bases for Comment:**

PWR primary systems are borated, but the storage cask or canister may be flushed with unborated water prior to sealing (to wash out any residual boron), and that unborated water might be a source for the rods.

**Suggested Revision/Replacement Language:**

Since it is not always known if the rods are failed, it seem that a criticality case should be run assuming water intrusion into the rods.

**Commentator:** NEI

**Summary of Issue:**

BWR and PWR considerations.

**Chapter:** 10                      **Section:** 10.4.2                      **Paragraph:** p. 10-5, 6

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:** X                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The list should include the considerations of BWR channels and PWR internal control components.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

Separate cases may not be needed.

**Chapter:** 10                      **Section:** 10.4.3.1                      **Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The section implies that a separate case is needed for elastic deformations of basket components.

**Bases for Comment:**

These deflections are typically very small, likely within the tolerances of the material and fabrications. The system analysis are not that sensitive to such small changes.

**Suggested Revision/Replacement Language:**

This may not be a realistic requirement.

**Commentator:** NEI

**Summary of Issue:**

Criticality design criteria.

**Chapter:** 10                      **Section:** 10.4.3.3                      **Paragraph:** 3

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

Provide justification or explain why credit for fuel burnup is not considered. Credit should be allowed for reactivity depletion with burnup since the casks are designed to store irradiated fuel.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**



## CHAPTER 11

**Commentator:** NEI

**Summary of Issue:**

NRC and EPA dual regulation.

**Chapter:** 11      **Section:** 11.4.2      **Paragraph:** 2nd, p. 11-16

**Type of Issue:** Please select one of the following categories:

**Suggestion:**      **Addition:**      **Grammatical Error:**

**Inconsistency:**      **Clarification:**

**Comment:**

Delete the paragraph or only retain the first line of the paragraph.

"The NRC accepts criteria in ANSI/ANSN 13.1 and N13.10 for sampling and effluent monitoring."

**Bases for Comment:**

The EPA does not regulate instrumentation. The NRC and EPA have been concerned about dual regulation of the NRC licensed facilities. The NRC has jurisdiction over instrumentation of NRC licensed facilities.

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

Transposed letters in word.

**Chapter:** 11

**Section:** 11.4.3

**Paragraph:** 3, bottom of page  
11-18

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:** X

**Inconsistency:**

**Clarification:**

**Comment:**

Transposed letters in the word from.

**Bases for Comment:**

Incorrect word usage

**Suggested Revision/Replacement Language:**

The word from should be replaced with the word form. . . .chemical or physical  
from that is not capable. . .

**Commentator:** NEI

**Summary of Issue:**

Failed fuel rods.

**Chapter:** 11                      **Section:** 11.4.4.2                      **Paragraph:** 11-20

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

"Failed" fuel rods may not require encapsulation prior to placement in storage.

**Bases for Comment:**

The statement should differentiate between the degrees of failure.

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

Purging

**Chapter:** 11

**Section:** 11.4.6

**Paragraph:** p. 11-24

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

Question: If hydrogen is used to force water out of a cask or canister, does that count as one purge?

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

## CHAPTER 12

**Commentator:** NEI

**Summary of Issue:**

PRA approach

**Chapter:** 12      **Section:** 12.4.1      **Paragraph:** p. 12-4, last  
full paragraph

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X      **Addition:**      **Grammatical Error:**  
**Inconsistency:**      **Clarification:**

**Comment:**

Why does the FSRP not use a PRA approach to accident occurrence for those  
bypass of systems?

**Bases for Comment:**

"Credibility" seems like a probability based concept.

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 12

**Section:** 12.4.1

**Paragraph:** p. 12-4

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

The last full paragraph on this page states that "...off-normal conditions are associated with potential frequency of occurrence." Then, the paragraph stipulates that frequency of occurrence is not a determinant with respect to safety criteria, only credibility of occurrence. This position does not provide the necessary guidance to the applicant.

**Bases for Comment:**

The ASME Code Section III Service Conditions B (upset), C (emergency), and D (faulted) provide clear guidance with respect to frequency of occurrence and safety limits. This document should be equally clear.

**Suggested Revision/Replacement Language:**

The off-normal event definition should be based on frequency of occurrence, either infrequent (Level C), with corresponding reduction in safety margins, or frequent (Level B), with higher safety margins. Accident conditions should be infrequent (or never), but should be credible (or at least bounding and incredible).

**Commentator:** NEI

**Summary of Issue:**

**Chapter:** 12

**Section:** 12.5.1

**Paragraph:** 1, p. 12-7

**Type of Issue:** Please select one of the following categories:

**Suggestion:**                      **Addition:**                      **Grammatical Error:**

**Inconsistency:**                      **Clarification:** X

**Comment:**

"reasonably" is like "credible" in that it seems judgmental rather than being probability based.

**Bases for Comment:**

What is reasonable to one may be incredible to another.

**Suggested Revision/Replacement Language:**

Are there guidelines for credible and reasonableness?

## CHAPTER 13

**Commentator:** NEI

**Summary of Issue:**

The FSRP does not address personnel qualifications.

**Chapter:** 13

**Section:** 13.4.1

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:** X

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

The FSRP does not provide acceptance criteria or guidance on personnel qualifications. Guidance should be provided for key ISFSI personnel such as the ISFSI manager, operations/maintenance manager, radiological engineer, and fuel handlers.

**Bases for Comment:**

10 CFR 72.28(c) requires the applicant to describe personnel qualifications. Section 9.1.3 of Regulatory Guide 3.48 requires that the SAR contain a description of personnel qualifications requirements.

**Suggested Revision/Replacement Language:**

Add a section to the FSRP that addresses personnel qualifications.



**Commentator:** NEI

**Summary of Issue:**

The FSRP does not provide the correct applicability of emergency planning requirements.

**Chapter:** 13

**Section:** 13.4.5

**Paragraph:** p. 13-12

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:** X

**Comment:**

The first bullet in FSRP Section 13.4.5 incorrectly indicates that the applicability of 10 CFR 72.32(a) is for ISFSIs not owned by DOE and that 72.32(b) is for ISFSIs owned by DOE or for an MRS. The applicability of these regulations is not based on whether the ISFSI is owned by DOE.

**Bases for Comment:**

10 CFR 72.32(a) is applicable to ISFSIs meeting one of the following criteria:

- not located on the site of a nuclear power reactor
- not located within the exclusion area of a nuclear power reactor
- located on the site of a nuclear power reactor which does not have an operating license
- located on the site of a nuclear power reactor that is not authorized to operate.

10 CFR 72.32(b) is applicable to ISFSIs that may process and/or repackage spent fuel and to an MRS.

**Suggested Revision/Replacement Language:**

Revise the FSRP applicability statements for 10 CFR 72.32 to reflect the applicability statements contained in the regulations.

**Commentator:** NEI

**Summary of Issue:**

The FSRP incorrectly references Regulatory Guide 3.48 and inappropriately uses the term "safety-related."

**Chapter:** 13

**Section:** 13.5.4

**Paragraph:** 1, p. 13-14

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

The last sentence of paragraph 1 of Section 13.5.4 is incorrect because Regulatory Guide 3.48, Section 9.4 does not use the term "safety-related."

**Bases for Comment:**

Regulatory Guide 3.48, Section 9.4 states:

9.4 Normal Operations

9.4.1 Procedures

The applicant should make a commitment to conduct operations that are important to safety in accordance with detailed written procedures. Include a list of procedures that, by title or subject, clearly indicates their purpose and applicability. Also include a description of the review, change, and approval practices for all installation, operating, maintenance, and testing procedures.

9.4.2 Records

Present the detailed management system for maintaining records relating to the historical operation of the installation. This system should include quality assurance records; operating records, including principal maintenance, alterations, or additions made; records of off-normal occurrences and events associated with radioactive releases; environmental survey records; and the identity and pertinent information of the spent fuel or high-level radioactive waste stored.

**Suggested Revision/Replacement Language:**

Delete the last sentence of paragraph 1 of FSRP Section 13.5.4.

**Commentator:** NEI

**Summary of Issue:**

Adequately trained staff

**Chapter:** 13

**Section:** 13.4.1,  
13.4.3

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:** X

**Comment:**

Because Section 13.4.1 includes provisions for cask loading/unloading at any time, and Section 13.4.3 references ANS 8.20, it is expected that staff appropriate to that function would be found in the list in Section 13.4.3. Engineering and "nuclear safety" staff is an indirect reference to a person that would have the knowledge to perform a critical evaluation.

**Bases for Comment:**

It is unclear if staff should be returned that have some proficiency in the methods used to determine cask sub-criticality. Should staff (perhaps part-time staff) be retained that have a proficiency in the codes described in the SAR that demonstrate sub-criticality? What about for stress analysis, etc.?

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

Misspelled word

**Chapter:** 13

**Section:** 13.4.4.2

**Paragraph:** 4th bullet on page  
13-11

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:** X

**Inconsistency:**

**Clarification:**

**Comment:**

The word "an" should be changed to the word "and".

**Bases for Comment:**

Incorrect word usage.

**Suggested Revision/Replacement Language:**

Replace "an" with "and". . . current inventory for spent fuel and high-level. . .

## CHAPTER 15

**Commentator:** NEI

**Summary of Issue:**

The FSRP does not appear to consider previously issued NRC guidance on acceptability of ISFSI QA programs.

**Chapter:** 15

**Section:**

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:** X

**Clarification:**

**Comment:**

On 6/20/86, the NRC issued a Branch Technical Position (BTP) on QA programs for ISFSIs titled, "Standard Review Plan for QA Programs for an ISFSI, 10 CFR Part 72," to spent fuel applicants, licensees, and vendors. Although this guidance remains in effect today, there is no mention of this guidance in FSRP Chapter 15; and the acceptance criteria in the BTP appear to be different than the acceptance criteria in the FSRP Chapter 15.

**Bases for Comment:**

ISFSI applicants and licensees have been using the BTP to help ensure that their QA programs are acceptable and meet the 10 CFR 72, Subpart G requirements. If the BTP and the FSRP do not align, then additional burden is likely to be placed on the licensee in preparing or revising QA program descriptions and on the NRC in reviewing QA program descriptions. As a side note, Regulatory Guide 3.62 specifically calls out the use of the BTP.

**Suggested Revision/Replacement Language:**

Revise the FSRP to be consistent with the contents of the BTP on ISFSI QA programs.

## CHAPTER 16

**Commentator:** NEI

**Summary of Issue:**

Possible missing text.

**Chapter:** 16

**Section:** 16.3

**Paragraph:** Subpart C (& D?)

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:** X

**Inconsistency:**

**Clarification:**

**Comment:**

Continuity between pages 16-2 and 16-3 is missing. Apparent missing text.

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

**Commentator:** NEI

**Summary of Issue:**

The FSRP does not reflect the latest change to the 10 CFR 72 decommissioning requirements.

**Chapter:** 16

**Section:** 16.3, 16.4.4

**Paragraph:**

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

In accordance with the latest change to 10 CFR 72.30 (see 61FR24669), decommissioning records must be kept until the site is released for unrestricted use versus until the license is terminated. These sections of the FSRP need to be updated, appropriately.

**Bases for Comment:**

10 CFR 72.30(d) states:

"Each person licensed under this part shall keep records of information important to the decommissioning of a facility in an identified location until the site is released for unrestricted use. If records important to the decommissioning of a facility are kept for other purposes, reference to these records and their locations may be used. Information the Commission considers important to decommissioning consists of--

**Suggested Revision/Replacement Language:**

Revise the FSRP to reflect the current requirements of 10 CFR 72.30.

**Commentator:** NEI

**Summary of Issue:**

Mechanisms to adjust ISFSI decommissioning fund.

**Chapter:** 16

**Section:** 16.3,  
16.4.2

**Paragraph:** 72.30(b), 3rd,  
p. 16-4

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

The means to adjust the decommissioning plan funding for an operating reactor is often to adjust the bus-bar cost of electricity. For an ISFSI operational after the reactor is shutdown the mechanism is less clear. What assurances are acceptable?

**Bases for Comment:**

The funding into the future can not be based on electric rates, especially for a unit that is not operating.

**Suggested Revision/Replacement Language:**



**Commentator:** NEI

**Summary of Issue:**

The FSRP does not provide adequate guidance for reviewing the decommissioning plan submitted with the license application.

**Chapter:** 16

**Section:** 16.4.1

**Paragraph:** p. 16-4

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:** X

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

The FSRP reference to using Regulatory Guide 3.65 (modified as appropriate for an ISFSI) for format and content guidance for the decommissioning plan to be submitted with the license application is not appropriate. Regulatory Guide 3.65 clearly defines the decommissioning plan as the plan submitted at the time the licensee terminates the license. Thus Regulatory Guide 3.65 requests information that is historical in nature (i.e., ISFSI radiological history) and that specifically describes the procedures to be used for decommissioning. What is needed for an ISFSI license application is guidance on what information related to decommissioning is desired prior to licensing the ISFSI. (It is recognized that Regulatory Guide 3.65 is useful for reviewing the final decommissioning plan required by 10 CFR 72.54.)

**Bases for Comment:**

Selection of specific decommissioning strategies and approaches depends to a large extent on the radiological history of the ISFSI. Additionally, decommissioning requirements and techniques are expected to change significantly over the ISFSI license period. Thus there is a significant difference between what would be included in a final decommissioning plan and the decommissioning plan submitted with the license application. The decommissioning plan submitted with the license application should focus on decommissioning design considerations, the overall decommissioning strategy, the decommissioning cost estimate, and maintenance of records for decommissioning.

**Suggested Revision/Replacement Language:**

Provide new guidance, including desired contents and acceptance criteria, for reviewing decommissioning plans submitted with a license application.

**Commentator:** NEI

**Summary of Issue:**

Decommissioning packaging and transportation.

**Chapter:** 16

**Section:** 16.5.2.1 **Paragraph:** 3rd, p. 16-7

**Type of Issue:** Please select one of the following categories:

**Suggestion:** X

**Addition:**

**Grammatical Error:**

**Inconsistency:**

**Clarification:**

**Comment:**

The section provides great detail as to the exactitude of the estimate to be made for "packaging and transportation and disposal of radioactive wastes . . ."

**Bases for Comment:**

**Suggested Revision/Replacement Language:**

## APPENDIX A

**Commentator:** NEI

**Summary of Issue:**

Duplicate paragraphs

**Chapter:** App. A

**Section:** Table A-1

**Paragraph:** p. A-78

**Type of Issue:** Please select one of the following categories:

**Suggestion:**

**Addition:**

**Grammatical Error:** X

**Inconsistency:**

**Clarification:**

**Comment:**

Repeated "Introduction" paragraphs on noted page.

**Bases for Comment:**

Incorrect word usage.

**Suggested Revision/Replacement Language:**

Delete repeated paragraphs.