**Mendiola, Doris**

**From:** Lesar, Michael
**Sent:** Thursday, October 15, 2009 1:51 PM
**To:** Mendiola, Doris
**Subject:** FW: FYI: NUREG-1520
**Attachments:** Comments on Chapter 5 of NUREG-1520 10-09.docx

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**From:** Tripp, Christopher
**Sent:** Wednesday, October 14, 2009 8:37 AM
**To:** Roman, Cinthya
**Cc:** Lesar, Michael
**Subject:** RE: FYI: NUREG-1520

Attached are my final comments on Chapter 5 of the re-write of NUREG-1520. Thank you again for the opportunity to comment.

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(3)



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Add = C. Roman (CIR1)

**Comments on Chapter 5 of NUREG-1520**
**Nuclear Criticality Safety (NCS)**

General Comments:

(1) A considerable amount of material concerning ISA has been added to Sections 5.1, 5.3.1, and 5.3.3. This material duplicates information found in Chapter 3, which is where it more appropriately belongs. Including this material here blurs the distinction between the technical ISA review and the programmatic NCS review.

The purpose of Chapter 3 is to provide general guidance for review of the ISA and ISA Summary. This includes both the overall ISA methodology review, by the ISA reviewer, and the horizontal and vertical slice reviews, by the individual technical reviewers (including the criticality safety reviewer).

The purpose of Chapter 5 is to provide guidance for the review of programmatic NCS commitments in the license application (LA). It is also guidance for review of the technical aspects of license renewals and amendments (criticality safety evaluations, calculations, validation documents, etc.) These items are part of the ISA, but go beyond what is included in the ISA Summary.

The suggestion is to clearly specify what guidance applies to what kind of review. One way to do this is segregate all the ISA-related guidance in Chapter 3, as was done in the previous version of NUREG-1520. Another is to confine all the ISA-related guidance to its own section of Chapter 5, the program-related guidance in its own section, and the technical review-related guidance in its own section. Right now the purpose of each part of the chapter is unclear.

(2) Each paragraph or bullet should be labeled (e.g., (a), (b), (c), or (1), (2), (3)...). There should also be more subheadings. Section 5.4 comprises most of the chapter and has a lot of different topics strung together without any apparent organizing structure. Doing this will make it easier to locate guidance on specific topics, and also make it easier to make reference to the SRP in RAIs, SERs, and so forth.

(3) For several years, it has been the practice in FCSS to include regulatory citations along with requests for additional information (RAIs). The idea was that this would cut down on unnecessary questions, but, since experienced reviewers do not ask unnecessary questions, the only effect has been to add unnecessary burden to the staff. To alleviate this wasteful and inefficient practice, the SRP should include regulatory citations along with its acceptance criteria whenever possible. (An example of where this *was* done is on page 5-10, with regard to 70.62.) That way, the regulatory citation would be established for all time, rather than having to reinvent the wheel for every RAI.

(4) Referring to the numerous specific comments, which include typographical mistakes and inconsistencies in the text, it is apparent that the development of this revision of the SRP was a rush job. The quality of the draft is very good, given the very limited time allowed, but NRC management should consider taking the time needed to polish the product rather than meet some arbitrary, self-imposed deadline for rushing the SRP out onto the street.

(5) In many cases, it is unclear who the guidance document is talking to—is the intent to be primarily guidance to the applicant, or to the reviewer? Since it is called a "Standard Review Plan," I am assuming the main intent is to provide guidance to a reviewer on how to do a technical review. If that assumption is correct, then everywhere it says that "the applicant should" do something, it sounds like guidance to the applicant rather than the staff. Suggestion is to replace this language with something like "the application should state..." rather than telling the applicant what to do.

Specific Comments:

(1) Page 5-1, 2nd paragraph: Rewrite as follows:

...nuclear criticality safety (NCS) program as described in the license application ~~and integrated safety analysis (ISA) summary~~...The review should examine the parts of the license application ~~and ISA summary~~ that describe the NCS program.

The NCS program is not typically described in the ISA Summary, but rather in the LA. Also, remove superfluous references in this chapter to 10 CFR 70.61. Calling 70.61 out specifically tends to diminish other parts of the rule that are just as important for safety.

(2) Page 5-1, last paragraph: Remove "ISA Summary, if applicable". This section is entitled "License Application," to which review of the ISA Summary is not relevant. Even if the ISA Summary were to contain a description of the NCS program, the LA must contain all the enforceable commitments.

(3) Page 5-2, 1st paragraph: Remove the last sentence. It is not the function of the NCS review to verify compliance with 10 CFR 70.61; that is the purpose of the ISA review. As stated above, this puts too much emphasis on 70.61, which tends to downplay other equally important parts of the regulations.

(4) Page 5-3, Section 5.3.3: Remove the introductory paragraph and first five bullets, up to the discussion of configuration management. Including this material here confuses things, because there's another section labeled "Nuclear Criticality Safety Program" and then this section labeled "Safety Program." That implies that the NCS Program and Safety Program are two separate things. They are not. The NCS Program is the safety program for NCS. The guidance contained herein is just simply a summarized version of what is in Chapter 3. Including it here is confusing, and, as it contains nothing new, it adds no value.

(5) Page 5-4, third bullet: Note that not all licensees have commitments to a corrective action program, as is assumed here. Unless we require that all licensees have such a corrective action program, this should be removed.

(6) Same page, paragraph under "Review Interfaces": This should not refer to "Chapter 5 of the license application." There is no requirement to follow the format of the SRP. Rather, this should simply say "the NCS section of the license application."

(7) This idea that the criticality reviewer should look at other portions of the license application is admirable, but unrealistic. The aggressive schedules that have recently been established for licensing reviews generally preclude this possibility.

(8) Same page, 1st bullet: inappropriately refers to "chemical safety" instead of "NCS"

(9) Same page: Technical Practices are omitted from Section 5.3 on "Areas for Review." They are discussed in the section on "Acceptance Criteria". This is a significant omission.

(10) Same page, Section 5.4: The sentence "Commitments and descriptions are expected when the acceptance criteria are relevant to the possession and use of nuclear materials and the materials to be licensed" should be removed. It doesn't say anything, and is also redundant (i.e., "materials to be licensed" are "nuclear materials.").

(11) Same page, Section 5.4.1: Since this is a chapter about NCS, regulatory requirements listed should be those specific to NCS (mainly 70.24, 70.61(d), and 70.64(a)(9)). Those listed here are generic regulatory requirements that apply across the board, and there is no value to repeating them here.

(12) Page 5-5, Section 5.4.2: Remove reference to NUREG-1513. This is not relevant to doing the NCS review, and is not even a very good reference for doing the ISA review. There are many other references that would be more relevant, if we need to include something, such as NUREG/CR-6361, NUREG/CR-6698, etc.

(13) Same page, Section 5.4.3: Remove the following:

"The applicant may elect to incorporate some or all of the requested criticality safety information in the facility and process description (SRP Section 1.1) or in the ISA summary, rather than in this section. Either approach is acceptable, as long as the information is adequately cross-referenced."

The SRP is not a standard format and content guide, and as such it is not intended to be guidance to the licensee. Its primary use is as guidance to the NRC staff. So it should not be speaking directly to licensees or offering advice on what it should put where. The part about "or in the ISA summary" is particularly problematic, because the ISAS is not part of the license. So any commitments they address there will not be legally binding and may be changed without prior approval. This statement is not regulatorily correct or consistent with our past practices (as when we have required licensees to move their ISA methodology commitments from the ISAS to the LA).

(14) Page 5-6, last paragraph: Remove the following: "Using the reasonable assurance of safety standard as described in the introduction to this SRP, the reviewer should determine whether the applicant has met the requirements of 10 CFR 70.61. The introduction, as well as Section 3.1 of the SRP describing the review of the ISA and ISA Summary, includes guidance on the level of detail needed to achieve this standard."

The reasons this should be removed are: (1) that the purpose of the NCS review is <u>not</u>, primarily, to ensure compliance with 70.61, (2) that this offers no useful guidance on what constitutes a "reasonable assurance of safety," and thus is highly subjective, and (3) that Section 3.1 of the SRP does not contain any actual guidance on the level of detail necessary to achieve this standard, either generally or for NCS. This

merely has some generic verbiage to the effect that the level of detail may vary, but does not give the reviewer any actual concrete guidance.

(15) Page 5-7, first bullet: The ANSI standards are not regulatory requirements, and should not be referred to as such.

(16) Page 5-7, last bullet: "The applicant meets the acceptance criteria in SRP Chapter 3 as they relate to subcriticatiy of operations and margin of subcriticality for safety." This information is much more applicable to the NCS review than to the ISA review (even though the regulatory citation is 70.61(d)). All the guidance related to subcriticality should be placed in Chapter 5.

(17) Page 5-8, last bullet: This refers to the 1983 version of ANSI/ANS-8.1. This has been reaffirmed and later superceded, and the most recent version of the standard should be used in the guidance. All standards references should be double-checked for currency.

(18) Pages 5-8 to 5-9: The section beginning with the discussion of baseline design criteria and ending just before Section 5.4.3.2, "NCS Program," does not belong here. This is generic ISA guidance and more appropriately belongs in Chapter 3, or else should be placed in its own section dealing strictly with the ISA review. Putting it here just blurs the distinction between the programmatic and technical reviews.

(19) Page 5-10, 2nd bullet: Rewrite as follows:

"The applicant meets ~~the intent of~~ ANSI/ANS-8.1-1998 and ANSI/ANS-8.19-1996 (see Regulatory Guide 3.71), or proposes an equivalent alternative, as they relate to organization and administration."

Guidance should not refer to the "intent" of a standard, as the intent can be difficult to ascertain. Also, this would make the NRC beholden to any re-interpretation of the standard that the standards body (ANSI) wishes to make in the future, which would make a government agency subservient to a non-governmental body. What is meant is that the licensee must commit to something that performs the same safety function if it does not wish to commit to the standard. Also, the SRP should be consistent in referring to specific versions of the standards (i.e., the SRP should include dates).

Examples of how this is handled inconsistently occur at the bottom of the page. In one place, it says "The applicant meets the intent of ANSI/ANS-8.19 and ANSI/ANS-8.20 as they relate to training," and in another place says "The applicant commits to ANSI/ANS-8.19-1996 is it relates to procedures." In one place, it includes the date, and in another place, it does not. In one place, it ask the licensee to meet "the intent" of a standard, and in another place, it asks the licensee to meet the standard. The latter approach, including the date and meeting the standard, are preferred.

(20) Page 5-11, second bullet: Remove the sentence "A graded approach may be used to justify an alternate NCS walkthrough schedule." This sentence is no longer needed. It was put in place because the previous version had specific time frames listed, so this was needed to allow flexibility. However, the time frames have been removed, so this no longer refers back to anything.

(21) Page 5-15, third bullet: The intent with regard to reflection control needs to be clarified. Specifically, the sentence "The adjacent materials should be farther than 30 centimeters (12 inches) from the unit" is unclear. For what purpose should the adjacent materials be one foot from the unit? I think that the intent of this paragraph is as follows: If there are materials that could potentially reflect neutrons closer than 12 inches, they should be explicitly included in the model. If they are further from 12 inches away, edge-to-edge, they do not need to be explicitly evaluated and are assumed bounded by a 1-inch nominal water reflector.

(22) Page 5-17, last bullet: This sentence was cut off, and does not continue on the next page.

(23) Page 5-18, first paragraph: This refers to the August 1998 version of Reg Guide 3.71. This has since been updated, and the most recent version should be cited.

(24) Same page, second paragraph: This also refers to meeting "the intent" of the standards. This phrase is vague and should be removed. The wording in the second bullet is better ("contains other commitments that are equivalent"). Even better would be to say that the licensee or applicant may meet the standard, or make other commitments that provide an equivalent level of safety.

(25) Same page, list of standards: The list is good and reasonably complete. It is necessary that Reg Guide 3.71 be updated soon so it will be consistent with the list in the SRP.

(26) Page 5-19, bottom of page: I disagree with the following statement: "The applicant may elect to incorporate some or all of the requested process information in the facility and process description (SRP Section 1.1) or the ISA Summary, rather than in this section." Note that per 10 CFR 70.65(b)(3) requires that the process information must be included in the ISAS. Also, reference to "this section" is unclear. This section of what? Is this talking about the license application or the SRP? The SRP is not a standard format and content guide (as commented above) and should not get into what information gets put in what section. There is no requirement to follow any specified format; that would cut against the idea of performance-based regulation.

(27) Same page, last paragraph: Reference to "chemical processes" appears to be a typographical error, as this is not relevant.

(28) Same page, last bullet: The bullet "Process descriptions are sufficiently detailed to allow an understanding of the criticality to allow development of potential accident sequences" is unclear. What does "an understanding of the criticality" mean? I think this is trying to say that you need an understanding of the controls and conditions relied on for NCS to do the ISA. That would be a true statement.

(29) Pages 5-20 to 5-21: Remove all the material on page 5-20 and the first half of 5-21. This information appears to have been cut-and-pasted from the ISA Chapter. Not only is it redundant to Chapter 3, it is also incorrect since general ISA requirements are not directly translatable into NCS. Adapting for NCS is not simply a matter of appending the phrase "for criticality hazards." For example, it talks about mitigating the consequences of an accident, which is a concept that is not applicable to NCS. It also contains a lot of bland and very generic motherhood and apple pie statements, such as: "The hazard

evaluation should use appropriate accepted methods." (Of course) The sentence "Each accident sequence identified by the applicant in the ISA should include a criticality hazard evaluation of potential interactions and key assumptions, vessels, process equipment, and facility personnel" is not clear. I don't know what a "criticality hazard evaluation" is, or what "potential interactions and key assumptions, etc." are. In general, licensees and applicants perform a criticality safety analysis that demonstrates double contingency and subcriticality under normal and credible abnormal conditions, which is then used as input to the ISA. Suggestion is to simply refer the reviewer to the appropriate section of Chapter 3.

(30) Page 5-21, Section 5.5.1, "Acceptance Review": This contains the sentence: "The reviewer should use the regulatory guidance of this chapter; references in this chapter; and the applicant's reports to the NRC (e.g., NRC Bulletin 91-01, 10 CFR 70.50, and 70.74)." Use them for what?

(31) Page 5-21, last paragraph: Remove the phrase "requirements for approval specified in Section 5.4." The acceptance criteria in the SRP are not requirements.

(32) Page 5-22, last paragraph: I strongly disagree with the statement: "The results of the ISA are the basis for the criticality safety evaluation." This is not true. The results of the criticality safety evaluation are part of the basis for the ISA—NCS evaluations are almost always done first, and adequate double contingency controls established, and then they are used as input (along with fire hazard analyses, process hazards analyses, etc.) to the ISA, with certain NCS controls being flowed down as IROFS. The fact that criticality controls comprise a larger set than the set of IROFS is proof that the NCS analysis takes precedence over the ISA. The ISA then is the basis upon which the ISAS is built.