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**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901



October xx, 2018

The Honorable James Richard Perry
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Secretary Perry:

On August 8, 2018, the Department of Energy published in the Federal Register a proposed revision to the Nuclear Safety Management Rule (10 C.F.R. Part 830). The Board has reviewed the changes the Department is proposing and encloses its concerns.

Yours truly,

Bruce Hamilton
Acting Chairman

c: Mr. Joe Olencz

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1. NUCLEAR SAFETY FUNDAMENTAL CONCEPTS

This is a general comment.

SUMMARY

The rule does not describe certain fundamental concepts of nuclear safety, such as the defense-in-depth philosophy or the hierarchy of controls. While these concepts are described in lower level documents, including DOE's expectations in the rule itself would emphasize their importance and encourage more consistent implementation.

CONCERN

Title 10 of the Code of Federal Regulations Part 830 is DOE's rule on Nuclear Safety Management, but it does not articulate some concepts fundamental to nuclear safety, as discussed below.

Part 830 does not explain the concept of defense-in-depth, or DOE's expectations in this regard. The defense-in-depth philosophy promotes multiple layers of defense against the inadvertent release of radioactive material, such that DOE is not exclusively relying on any one layer for safety. As stated in Appendix A.9 of DOE Standard 3009-2014, the layers are "generally redundant and independent of each other." DOE Order 420.1C, *Facility Safety*, includes an expanded discussion of what defense-in-depth entails.

Part 830 also does not discuss the hierarchy of controls. The DOE's hierarchy of controls consists of a series of preferences on the types of controls selected to prevent or mitigate a potential accident scenario. DOE Standard 1189-2016, *Integration of Safety into the Design Process*, includes a description of the hierarchy in Section 4.1.4. The first preference is to minimize or eliminate the use of hazardous materials, where practical. After that, there is a preference for engineered controls over administrative controls; a preference for passive structures, systems and components (SSC) over active SSCs; a preference for preventive controls over mitigative controls; a preference for controls closest to the hazard; and a preference for controls that are effective for multiple hazards.

While Part 830 includes requirements for a preliminary documented safety analysis, DOE did not update Part 830 as DOE further developed its processes and expectations for integrating safety into design. DOE Standard 1189 and the Board's letter dated April 21, 2015 discuss the importance of integrating safety into the design, early in a project.

Additional core concepts include desired features of safety control sets, such as reliability, diversity, redundancy and independence.

2. HAZARD CATEGORIZATION

This comment pertains to various changes DOE is proposing, as discussed in the proposed rule at 83 Fed. Reg. at 38983, under the heading “DOE Standard 1027”.

SUMMARY

By removing the definitions of the hazard categories from Part 830 and the rulemaking process, DOE’s proposed revisions fundamentally undermine the important nuclear safety requirements in the rule. The Department could redefine hazard categories such that many facilities are no longer covered by the safety basis requirements of Subpart B, without conducting a rulemaking to receive public feedback and comment.

CONCERN

Hazard categorization is important because it determines whether the safety basis requirements of Subpart B are applicable to a facility and because it informs the application of a graded approach when implementing the requirements in Part 830.

The safety basis requirements in Subpart B apply to Hazard Category 1, 2, or 3 nuclear facilities. With DOE’s proposed revisions, Part 830 would not include any language that defined these terms, and any changes to the definitions of these terms would occur outside the rulemaking process. This situation will arise because:

- DOE is deleting Table 1 from the existing version of Part 830. Table 1 included a qualitative description of Hazard Category 1, 2, and 3 facilities.
- Part 830 currently cites one specific version of DOE Standard 1027 as providing the quantitative approach for hazard categorization. DOE is proposing to insert “**or successor document**” where this Standard is referenced, to allow changes to the quantitative approach without further rulemaking activities.
- Both the existing version and proposed revision of Part 830 state that the contractor must “categorize the facility consistent with” Standard 1027. During implementation, the words “consistent with” might be interpreted to allow flexibility to not actually follow the Standard. In fact, some National Nuclear Security Administration facilities have already adopted a different quantitative approach via a supplemental guidance document not cited in Part 830 (i.e., NNSA Supplemental Guidance 1027, *Release Fraction and Modern Dosimetric Information Consistently with DOE STD 1027-92, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*). The unintended consequence of allowing variations from the specified Standard is that it introduces variation throughout the complex, reverts the

Department toward an expert-based rather than standards-based approach to safety, and ultimately limits the Department's own ability to regulate its contractors.

By removing the definitions of the hazard categories from Part 830 and the rulemaking process, DOE's proposed revisions fundamentally undermine the important nuclear safety requirements in the rule. Entirely outside the rulemaking process, the Department could redefine the hazard categories such that many facilities are no longer covered by the safety basis requirements of Subpart B. In the longer term, DOE is planning on revising the methodology in Standard 1027, but the DOE Notice of Proposed Rulemaking does not describe what changes DOE might make.

An initial impetus behind the promulgation of Part 830 was passage of the Price Anderson Amendments Act of 1988; DOE's subsequent policy was to limit enforceable Nuclear Safety Requirements to Compliance Orders and regulations published in the Code of Federal Regulations following appropriate notice-and-comment procedures (see the preamble to the Final Rule for 10 C.F.R. Part 820, 58 Fed. Reg. 43680 (Aug. 17, 1993)). However, the proposed change in the Notice of Proposed Rulemaking to incorporate successor versions of Standard 1027 via the general phrase "or successor document," will allow DOE to revise Standard 1027 without any rulemaking activity, and without the notice-and-comment procedures of the Administrative Procedures Act. Furthermore, 1 C.F.R. § 51.1(f) limits incorporation of standards into the Federal Register to a specific version of a particular standard; subsequent revisions to that standard are not included absent another future rulemaking. Per 5 U.S.C. § 552(a), information is deemed published in the Federal Register when it is incorporated therein with the approval of the Director of the Federal Register.

Also, as DOE publishes revisions to Standard 1027, the contractor responsible for a facility will be able to use the version specifically cited in Part 830 (DOE-STD-1027-92, Change Notice 1, September 1997), or any subsequent revision of DOE-STD-1027. The proposed change could lead to a circumstance where different facilities implement different versions of Standard 1027. Such an approach was rejected by DOE in 2001 when commenters suggested that Standard 1027 be included as one of the Appendix's "safe harbor" provisions rather than a requirement for hazard categorization. At that time, the Department stated that it wanted "contractors to be consistent when determining the hazard classifications for its nuclear facilities" (66 Fed. Reg. 1810, 1813 (Jan. 10, 2001)).

3. ANNUAL UPDATES TO DOCUMENTED SAFETY ANALYSES

This comment pertains to the changes DOE is proposing to § 830.202, as discussed in the proposed rule at 83 Fed. Reg. at 38984, under the heading “DOE Approval of Annual DSA Updates.”

SUMMARY

The removal of the requirement for DOE’s annual review and approval of documented safety analyses makes it more difficult for the Department to exercise its responsibility to protect the health and safety of workers and the public. There is a potential for the safety basis and facility operations to drift outside the envelope approved by DOE. Furthermore, DOE’s notice of rulemaking does not fully analyze the problems that DOE is attempting to address, so it is not clear that DOE’s proposed change is an appropriate solution.

CONCERN

In the Notice of Proposed Rulemaking, the Department of Energy is proposing to eliminate the requirement for Departmental approval of the contractor’s annual updates of the documented safety analysis (DSA). In its notice, the Department states that the existing version of Part 830 “effectively requires the contractor to submit changes to the DSA for DOE approval twice”, because DOE already approves some changes through the unreviewed safety question (USQ) process. The Department states, as part of its justification in making this change, that

*While the guidance is clear **in the intent to drive focus of DOE’s approval to the change identified in the USQ process, the regulations’ additional requirement for a second approval has led to considerable implementation challenges, and unnecessary review iterations without providing additional safety benefit.***

[Emphasis added]

The guidance referred to above is from DOE Standard 1104-2016, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*.

In 2001 when the Department issued the final rule creating Subpart B, the Department responded to similar comments about DOE reviewing contractor USQ submissions (66 Fed. Reg. 1810, 1815-16 (Jan. 10, 2001)):

JJ. Comment: Several commenters asked why a contractor is required to submit the annual update of the documented safety analysis to DOE for approval when DOE will have already approved any changes to be incorporated in the documented safety analysis through the USQ process.

*Response: DOE requires contractors to obtain DOE approval of the annual update of the documented safety analysis to **assure that both the changes made pursuant to the USQ process and any changes not covered by the USQ process***

have been properly included in the update. If the USQ process has been followed properly, the annual approval of the documented safety analysis should require minimal effort. The annual update will not require DOE to review USQs already approved by DOE. [Emphasis added]

At the time, the Department expected that review and approval of annual updates would not be a challenge. If DOE and its contractors are experiencing significant challenges, it is worth examining why that is the case, instead of simply deleting the requirement for the Department to approve the annual update. The Notice of Proposed Rulemaking does not truly analyze the root causes for why the Department and its contractors are having difficulties managing annual updates.

If the annual update cycle is involving more than the “minimal effort” that DOE once expected, that is an indication that annual updates are more complex than expected. DOE’s discussion of its proposed changes does not explore the reasons for this situation. For example, there could be a change in the facility mission or process, involving extensive new analysis and changes to the controls. Such a scenario could involve extensive changes to the DSA, and so a significant review by the Department should be expected. Substantial and complex changes in the safety basis could also arise as a result of the discovery of Potential Inadequacies in the Safety Analysis. In some cases, the Department or its contractor may have decided that a complete overhaul of the DSA was necessary. One example is the substantial update to the safety basis of the Waste Isolation Pilot Plant in the aftermath of the 2014 truck fire and radiological release events. If there are cases where there have been multiple “review iterations”, that could be a sign of disagreement between DOE and its contractor. In such cases, DOE may be able to proceed more efficiently by using its authority to direct changes. Difficulties in the annual update could also indicate that the Department’s contractors are not implementing the USQ process well. DOE is eliminating its approval of annual updates without fully analyzing the problem it is trying to solve. It would be better to understand the underlying problem before making a change.

In Appendix A to Subpart B, DOE is adding language to clarify that DOE will continue to review the DSA updates in some cases, and may even approve the annual update in some cases. The new language states, “DOE will review each documented safety analysis...if DOE has reason to believe a portion of the safety basis has substantially changed.” Another relevant new sentence is “If additional changes are proposed by the contractor and included in the annual update that have not been previously approved by DOE or have not been evaluated as a part of the USQ process, DOE must review and approve these changes.” DOE’s notice does not include detailed discussion of these changes. It may be the case that DOE is adding this language in order to address types of scenarios discussed above. However, the new language in the Appendix does not mitigate concerns with removing DOE’s approval of the annual update. The language is vague; it is not clear how DOE field offices will interpret “substantially changed” as they decide when to review annual updates. It would be better

for DOE to continue reviewing and approving annual updates, with less effort required in simple cases, and more effort being spent in more complex cases.

If DOE eliminates its approval of annual updates, the proper implementation of the USQ process becomes even more critical to ensuring safety. However, the Board is not confident that the USQ process is consistently being implemented well by the contractors. Further, there is a potential for multiple changes that did not require Departmental approval (i.e., negative USQ determinations) to have a cumulative effect that takes the safety basis outside the approved envelope. Even in the case of positive USQs where the Department approves changes as the contractor makes them, the annual update provides an opportunity for the Department to consider the cumulative effect of several changes. DOE Standard 1104-2016 captures this concept in Section 7.1.2 where it states, “Review of DSA revisions, addenda, and updates should consider the cumulative effect of changes to the DSA and their impact on usability and accuracy of USQ reviews.” There is also the possibility that a contractor might make negative USQ determinations and implement facility changes without first obtaining DOE approval, in cases where a positive USQ determination would have been more appropriate. If the Department implements the proposed rule, it would be less likely to verify that changes have not adversely moved the approved safety envelope.

Given that a robust USQ process would be even more important if DOE makes its proposed change, it is worth revisiting Part 830’s requirements related to USQ. DOE’s basis for not requiring DOE approval of annual updates of the DSA includes the idea that DOE has already approved important changes to the safety basis through the USQ process. In section 830.203(d), Part 830 states that the contractor “must obtain DOE approval prior to taking any action determined to involve a USQ.” Part 830 does not specify what documentation the contractor must provide to DOE as part of obtaining approval. In particular, Part 830 does not specify whether the contractor would submit any planned changes to the safety basis, or even a description of planned changes. When DOE approves the contractor taking the planned action, it is not at all clear that DOE is specifically approving (or has even seen) any planned changes to the safety basis.

Appendix A to Subpart B of the rule states that “DOE has ultimate responsibility for the safety of its facilities...” In Recommendation 2004-1, the Board made the following observation,

The United States owns the defense nuclear facilities at which its programs are carried out by a government agency—DOE. Each such facility is operated by a contractor that was selected by DOE on the basis of being best suited to conduct the work for DOE at that site. Under the original Atomic Energy Act of 1946 and continuing to date in the Atomic Energy Act of 1954, as amended, the government officials in charge (i.e., the Secretary of Energy and other line officers) have a statutory responsibility to protect health and minimize danger to life or property. In any delegation of responsibility or authority to lower echelons of DOE or to contractors, the highest levels of DOE continue to retain safety

*responsibility. **While this responsibility can be delegated, it is never ceded by the person or organization making the delegation.** Contractors are responsible to DOE for safety of their operations, while DOE is itself responsible to the President, Congress, and the public. [Emphasis added]*

While the proposed revision to the rule retains the ability of the Department to review the safety basis and direct changes, the removal of the requirement of annual Departmental approval makes it more difficult for the Department to exercise its responsibilities described above. A Departmental review of the documented safety analysis, including formal approval and preparation of a safety evaluation report, is warranted at some periodicity. If an analysis of the difficulties faced by the Department shows that a change to the review cycle is warranted, the Department should consider a longer review period, not its dissolution.

4. JCOs, ESSs, AND THE ANNUAL UPDATE PROCESS

This comment pertains to the changes DOE is proposing to § 830.202, as discussed in the proposed rule at 83 Fed. Reg. at 38984, under the heading “DOE Approval of Annual DSA Updates”

SUMMARY

With DOE’s proposal to remove the requirement for Departmental review and approval of annual updates, there will be gaps in Part 830 where DOE is not required to approve significant changes in a facility’s safety basis.

CONCERN

DOE is proposing to remove the requirement for DOE approval of annual updates to the documented safety analysis (DSA). The rationale for this change is that DOE would have already approved important changes via the unreviewed safety question (USQ) process.

There are gaps in this framework, such that DOE does not necessarily approve important changes to the safety basis. For example, gaps exist in cases where the contractor declares a potential inadequacy in the safety analysis (PISA). In the case of a PISA, the first requirement in the rule is for the contractor “to place or maintain the facility in a safe condition....” The contractor then performs a determination to see whether the PISA represents a USQ, which may involve the identification of additional operational restrictions (as described in DOE Guide 424.1-1B Change Notice 2, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements*). At the PISA and USQ determination steps, the rule does not require DOE approval of operational restrictions implemented by the contractor to achieve a safe condition. Given the need to achieve a safe condition in a timely manner, it is appropriate not to require formal DOE approval before those restrictions are enacted. DOE should still review the restrictions and direct changes if needed, as described in Sections C.4 and C.5 of DOE Guide 424.1-1B.

In some cases, however, those operational restrictions (or other compensatory measures) may continue to be required for a long period of time. Per DOE Guide 424.1, the vehicle for operating under restrictions for “an extended period of time” is the Justification for Continued Operations (JCO). The JCO is a “temporary change to the facility safety basis.” The DOE guide states that the contractor should submit the JCO to DOE for approval. However, the concept of a JCO is not mentioned in the rule, so the rule does not formally require DOE approval of a JCO. Typically, the contractor eventually incorporates the operational restrictions and accompanying analyses (or some revised version of them) into the DSA via the annual update. With DOE’s proposed revision to the rule, there will be important changes to the safety basis with no rule requirement for DOE approval.

In some cases, instead of a JCO, the contractor prepares an Evaluation of the Safety of the Situation (ESS) that includes operational restrictions. The DOE Guide states that DOE should approve ESSs for PISAs that represent a USQ; again, however, the rule does not require DOE approval. Under DOE's proposed revision to the rule, the ESS can represent a mechanism for the contractor to make important changes to the safety basis without any requirement for DOE approval.

Even if DOE approves a JCO or ESS, there are cases where the contractor makes further revisions to the operational restrictions and analyses before incorporating the changes into the DSA via the annual update.

In its proposed changes to Appendix A to Subpart B of the rule, DOE is adding language that may have been intended to catch such circumstances. The addition states "If additional changes are proposed by the contractor and included in the annual update that have not been evaluated as a part of the USQ process, DOE must review and approve these changes." However, by itself, this added language is not specific enough to address all the situations discussed in this comment.

5. LANGUAGE REGARDING DOE APPROVAL

This comment pertains to § 830.207(b) and § F of Appendix A to Subpart B, as discussed in the proposed rule at 83 Fed. Reg. at 38993 and 38994.

SUMMARY

The proposed rulemaking creates uncertainty over when DOE will review and approve the documented safety analysis; clarity on the matter is important because DOE is ultimately responsible for safety at its facilities.

CONCERN

In DOE's proposed revision to Part 830, additional clarity is warranted in language concerning DOE approvals. Given that DOE is ultimately responsible for safety at its facilities, Part 830 should be clear on when DOE reviews and approves safety documents.

The proposed revision to section 830.207(b) states: "Pending issuance of a safety evaluation report in which DOE approves an updated or amended safety basis for an existing Hazard Category 1, 2, or 3 DOE nuclear facility, the contractor responsible for the facility must continue to perform work in accordance with the DOE-approved safety basis for the facility and maintain the existing safety basis consistent with the requirements of this Subpart."

With DOE removing its approval of annual updates from 830.202(c)(2), it is not clear when the language of 830.207(b) would be invoked. In Appendix A to Subpart B, DOE is adding a sentence saying that under some circumstances, "DOE must review and approve" changes in an annual update. These circumstances are not unambiguously defined. It will not be clear when the contractor can implement the annual update without DOE approval, and when the contractor must wait for DOE approval (per 830.207(b)) before implementing.

Further, in Appendix A to Subpart B, DOE is adding a list of the circumstances when it will review the DSA. DOE will review the DSA when "a portion of the safety basis has substantially changed." The list does not otherwise mention annual updates. While the proposed revision to Part 830 makes it clear that DOE will generally not approve annual updates, this list in the Appendix makes it unclear whether DOE will even review the annual updates.

6. DOE REQUIREMENTS IN THE APPENDIX OF THE RULE

This is a general comment pertaining to Appendix A to Subpart B, as discussed in the proposed rule at 83 Fed. Reg. at 38993.

SUMMARY

There is an internal inconsistency in the proposed Rulemaking: it states that Appendix A contains no new requirements, though that Appendix includes “must” statements. Some of the “must” statements only appear in the Appendix, and not the body of the rule, and are important to safety.

CONCERN

DOE has stated that it does not consider Appendix A to Subpart B to include any requirements and intends to make future revisions to Appendix A without seeking public comment.

Appendix A to Subpart B of Part 830 has an introduction that states that it:

“...describes DOE’s expectations for the safety basis requirement of 10 CFR part 830, acceptable methods for implementing these requirements, and criteria DOE will use to evaluate compliance with these requirements. This Appendix does not create any new requirements...” (83 Fed. Reg. at 38993, Subpart B, Appendix A § A)

However, the Appendix uses the words ‘must’ or ‘require’ several times for important statements that do not explicitly appear in the main body of Subpart B. As DOE stated in the Federal Register when publishing the interim final rule, the word “must” is used “to indicate an obligation.” (65 Fed. Reg. 60291, 60293, § II.A (Oct. 10, 2000))

The following are examples where the Appendix uses “must” for statements that do not appear in the main body of Subpart B.

“A documented safety analysis must address all hazards (that is, both radiological and nonradiological hazards) and the controls necessary to provide adequate protection to the public, workers and environment from these hazards.” (83 Fed. Reg. at 38993, § E.4)

This statement is important to nuclear safety because nonradiological hazards can initiate or exacerbate accident sequences involving radiological material. While there is a mention of “other hazardous materials” in Section 830.204, it is not as clear as the statement in Appendix A.

Below is another example of a ‘must’ statement that is unique to the Appendix:

“If additional changes are proposed by the contractor and included in the annual update that have not been previously approved by DOE or have not been evaluated as part of the USQ process, DOE must review and approve these changes.” (83 Fed. Reg. at 38994, § F.3)

DOE is proposing to add this statement in the current rulemaking, and it is important in light of DOE’s proposal to remove DOE approval of the contractor’s annual updates of the documented safety analysis. DOE is removing that approval step on the grounds that any changes with safety relevance would have been already reviewed and approved by DOE through the USQ process. This statement in the Appendix is meant to catch instances where the annual update includes changes that are relevant to safety and were not previously approved by DOE.

7. REQUIREMENTS ON UNREVIEWED SAFETY QUESTIONS AND TECHNICAL SAFETY REQUIREMENTS

This comment pertains to § 830.203, § 830.205, and § G-H of Appendix A to Subpart B, as discussed in the proposed rule at 83 Fed. Reg. at 38992 and 38995-7.

SUMMARY

There is ambiguity on how contractors implement technical safety requirements and evaluate unreviewed safety questions because the Rule provides or cites only guidance for implementation in some key areas, and not requirements. This could lead to inconsistent implementation of the Rule throughout the Department and has the unintended consequence of making it difficult for the Department to regulate, oversee, and enforce the requirements governing these functions.

CONCERN

In the Notice of Proposed Rulemaking, the Department of Energy maintains two Guides as references in Appendix B, i.e., DOE Guide 423.1-1B, *Implementation Guide For Use In Developing Technical Safety Requirements* (Subpart B, Appendix A, G.4) and DOE Guide 424.1-1B, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements* (Subpart B, Appendix A, H.3). These two documents contain guidance on how a contractor could comply with requirements in the Rule for developing technical safety requirements (TSR) (§ 830.205(a)) and developing and implementing an unreviewed safety question (USQ) process (§ 830.203). Further explanation and expectations regarding the content of TSRs is in Appendix A itself. These topics are of high importance to the safety basis, and to defining and maintaining a DOE-approved envelope for operating a facility safely. The TSRs define “limits, controls and related actions for the safe operation of a nuclear facility” (§ 830.3). The USQ process is “the mechanism for keeping a safety basis current...” (§ 830.3).

The two Guides provide guidance, and not requirements. The Rule cites the two guides in a manner that presents them as guidance documents. Further, the cover pages to both Guides state:

This Guide describes acceptable, non-mandatory means for meeting requirements. Guides are not requirements documents and are not to be construed as requirements in any audit or appraisal for compliance with associated rules or directives.

Because the guidance is optional and not a requirement, contractors throughout the Department have diverse processes for meeting the Rule. The Department acknowledges this variability stating, “While the quality and completeness of safety basis documents is increasing, there is still a wide disparity in those attributes of approved safety bases throughout the DOE

complex.” (DOE G 424.1-1B, Appendix B, B.12.1) The necessity for robust technical safety requirements and unreviewed safety question processes cannot be understated.

The importance of these two processes, as well as experience with challenges in implementation, suggests that clearer requirements are warranted. One possible method would be to elevate important portions of the Guides into the Rule. Another possibility is to convert the Guides into Orders. The Orders would clearly have ‘shall’ statements where requirements should exist. A combination of the two methods could also be considered.

Requirements Regarding the Unreviewed Safety Question Process—DOE Guide 424.1 provides an example of guidance on USQs that should be considered for elevation to a requirement. The Guide includes expectations on the timeliness with which the contractor processes potential inadequacies in the safety analysis (PISA):

“It is appropriate to allow a short period of time (hours or days but not weeks) to investigate the conditions to confirm that a safety analysis is potentially inadequate before declaring a PISA... If it is immediately clear that a PISA exists, then the PISA should be declared immediately.” (DOE G 424.1-1B, Section C.2)

This timeliness is important for safety, as it causes the contractor to formally declare a PISA and take actions to place the facility in a safe condition. Contractors do not always perform this step in a timely manner. This leads to delays in implementing the necessary compensatory measures to place or maintain the facility in a safe condition. There are instances where contractors have delayed a PISA declaration because the information is not yet deemed mature enough to merit that action. The DOE guidance quoted above already addresses this situation, saying that the contractors may take hours or days to investigate, but not weeks. This guidance on timeliness should be formalized into a contractor requirement, to ensure that contractors place facilities into safe conditions when PISAs are discovered. If DOE believes it is necessary to make some allowance for delaying action because the new information is immature, DOE should define a process for defining ‘maturity’. Regarding information as ‘immature’ and not declaring a PISA should be exceptional.

Requirements Regarding Technical Safety Requirements—DOE Guide 423.1-1B includes content on TSRs that should be considered for elevation to the Rule. In Appendix C to that Guide, DOE combines the § 830.201 requirement for the contractor to “perform work in accordance with the DOE-approved safety basis” with the Quality Assurance requirements in Subpart A of the Rule. From these two portions of the Rule, DOE derives a need for the contractor to “independently confirm the proper implementation of new or revised safety basis controls.” This is an important concept for ensuring safe operation of the facility, and should be directly included in the Rule.

One area of difficulty during implementation has been in the determination of “completion times”. The TSRs typically define actions the contractor will take when safety structures, systems and components (SSC) do not meet their limiting conditions for operation. This scenario can occur intentionally due to a maintenance outage, or unintentionally due to degradation of the SSC. The TSRs define the required times (completion times) by which the

contractor will take compensatory actions to compensate for the loss of the safety SSCs, or by which the contractor will restore the SSC. According to the Guide, when developing completion times, the contractor should consider “the safety importance of the lost safety function” and “the risk of continued operations”. In practice, there are sometimes completion times that appear excessive, with no documented consideration of safety risk. Appendix A to Subpart B should be revised to include the concept that safety risks should be considered when developing completion times.

Additionally, the body of the rule is scarce on requirements for the content of the TSRs. In the body of the rule, only the definition section describes the contents of the TSRs. Otherwise, the content of TSRs is only described in Appendix A to Subpart B. Given that the TSRs are an important part of the safety basis, there should be clear requirements on their content.

8. AGING INFRASTRUCTURE

This is a general comment.

SUMMARY

Aging infrastructure is a challenge to DOE in its efforts to operate facilities safely. Part 830 does not address this challenge.

CONCERN

DOE faces a major challenge in the aging infrastructure of its existing facilities. DOE is using many facilities past their intended design life. In some cases, the creation of replacement facilities has been delayed or deferred. For example, the Uranium Processing Facility at the Y-12 National Security Complex is delayed compared to earlier schedules, and DOE has decided it will have less scope than initially planned, such that some aging facilities at Y-12 will continue to operate well past their intended design life. In other cases such as the Tank Farms at the Hanford and Savannah River Sites, there is no replacement facility; rather, DOE contractors will operate the tank farms until other facilities successfully process the remaining waste.

As facilities age, a concern develops over whether they can be operated or maintained safely. Safety structures, systems and components may degrade and not be able to perform their safety function. Facilities may even collapse, as in the recent case of a storage tunnel at the PUREX facility at the Hanford site.

In the commercial industry, the Nuclear Regulatory Commission has requirements for renewing the license of power plants (10 C.F.R. Part 54, *Requirements for Renewal of Operating Licenses for Nuclear Power Plants*). One component of this regulation is an aging management review. In contrast, DOE safety bases do not expire, and DOE regulations such as Part 830 do not require aging management reviews. While DOE performs some upgrades and retrofits at its aging facilities, it lacks a formal regulatory structure for identifying and performing those upgrades that are necessary for the adequate protection of the worker and the general public.

9. INVOCATION OF DOE STANDARD 3009-2014

This comment pertains to § 830.204, as discussed in the proposed rule at 83 Fed. Reg. at 38992.

SUMMARY

The proposed rule does not specify the need to use the most current version of safe harbors (e.g., DOE Standard 3009-2014), allowing the continued use of older, less robust versions. While DOE has enacted some requirements for when the newer version of Standard 3009 should be used, DOE has not included those requirements in Part 830.

CONCERN

Part 830 includes a table of safe harbor methodologies for preparing a documented safety analysis. The table provides different safe harbors for different facilities and scenarios. DOE Standard 3009, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, is a commonly used safe harbor. There are two active versions of this standard. The safe harbor table does not provide guidance on which version should be used. The most recent version is Standard 3009-2014, and it provides more clear requirements than the preceding versions. DOE revised DOE Order 420.1, *Facility Safety*, to specify when the use of Standard 3009-2014 was required. The more natural location for the direction to use Standard 3009-2014 is in Part 830.

Furthermore, in its letter dated April 1, 2015, to the Secretary of Energy, the Defense Nuclear Facilities Safety Board wrote that it was “encouraged by the significantly improved safety requirements contained in these standards.” The Board encouraged DOE to plan “for a longer-term transition to widespread application of Standard 3009-2014.” However, only a very small number of facilities has adopted the revised standard, and there is little or no momentum for a broader transition to the revised standard.

10. DOE's NUCLEAR SAFETY POLICY

This is a general comment.

SUMMARY

The proposed revision to Part 830 no longer cites a reference explaining the key role that rules like Part 830 provide in ensuring adequate protection of workers and the public.

CONCERN

In the proposed revision, DOE is deleting the reference to DOE Policy 450.2A, *Identifying, Implementing, and Complying with Environment, Safety and Health Requirements*. That document described the important role of requirements in ensuring the “adequate protection of workers, the public and the environment.”

While DOE has cancelled Policy 450.2A, Part 830 continues to make several references to the “adequate protection of workers, the public, and the environment”. DOE Policy 420.1, *Department of Energy Nuclear Safety Policy*, is a current document that articulates what actions DOE takes to ensure adequate protection. The list of actions starts with “Establishing and implementing nuclear safety requirements....” Part 830 would be improved by including a reference to Policy 420.1, to help emphasize and explain the role of nuclear safety requirements in providing adequate protection.

11. DOE STANDARD 3009-2014 ENGINEERING EVALUATIONS

This comment pertains to § 830.204 and Appendix A to Subpart B, § G, as discussed in the proposed rule at 83 Fed. Reg. at 38992 and 38995.

SUMMARY

Most existing facilities apply a safe harbor methodology that does not include clear requirements on how to evaluate the reliability of structures, systems and components that are being upgraded to a higher safety classification.

CONCERN

Part 830 includes discussion of safety structures, systems and components (SSC), including safety class and safety significant. DOE Order 420.1, *Facility Safety*, includes design criteria for safety SSCs in new facilities and major modifications to existing facilities. For existing facilities, Section 3.4 of DOE Standard 3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, provides requirements on evaluating the performance of safety SSCs. However, the vast majority of existing facilities are not applying Standard 3009-2014. For those facilities, DOE Standard 3009-94 Change Notice 3 contains much more limited guidance on evaluating the reliability and performance of safety SSCs. This situation affects both the performance of existing safety SSCs, as well as cases where the safety classification of a SSC is being upgraded. Such upgrades often happen as DOE contractors revise the safety basis of an existing facility. A general service SSC may be upgraded to safety significant or safety class, or a safety significant SSC may be upgraded to a safety class SSC. When this occurs in an existing facility, it is important to understand whether the newly upgraded SSC can perform its required safety function.

12. SPECIFIC ADMINISTRATIVE CONTROLS

This comment pertains to § 830.3, *Definitions*, and Appendix A to Subpart B, § G, *Hazard Controls*, as discussed in the proposed rule at 83 Fed. Reg. at 38988 and 38995.

SUMMARY

The Department added Specific Administrative Controls to the suite of safety controls, but did not revise the Rule to incorporate this concept. While administrative controls are less preferred on DOE's hierarchy, there is sometimes a need to implement them for important safety functions. Having Specific Administrative Controls defined in the Rule would clearly place this concept within nuclear safety requirements, and ensure better consistency between the Rule and lower level documents.

CONCERN

Part 830 both defines "safety structures, systems and components" and discusses how these safety controls will be documented in a facility's documented safety analysis (DSA) and technical safety requirements (TSR).

When identifying safety controls, DOE contractors sometimes use administrative controls that have a safety function commensurate with safety structures, systems and components. DOE refers to such administrative controls as "specific administrative controls" (SAC).

DOE created the concept of the SAC in response to the DNFSB's Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*. To provide guidance on this topic, DOE created a new standard (Standard 1186) and revised several other standards and guides. However, DOE did not revise Part 830 to reflect the new concept of the SAC. As a result, the discussion in Part 830 on safety controls is incomplete and does not fully reflect current DOE terminology and practice.

13. CHANGES TO TECHNICAL SAFETY REQUIREMENTS

This comment pertains to Section 830.203, *Unreviewed safety question process* and Section 830.205, *Technical safety requirements*, as discussed in the proposed rule at 83 Fed. Reg. at 38992.

SUMMARY

Part 830 is written in a way that could inadvertently lead to confusion, on the topic of when DOE approval is needed for changes to the safety basis.

CONCERN

According to Section 830.205(a)(2), the contractor must obtain DOE approval of any change to the technical safety requirements (TSR), prior to use. This requirement is important, as the TSRs describe the “limits, controls, and related actions” needed “for the safe operation” of the nuclear facility.

While this requirement is very clear, there is potential for users to miss it. Section 830.203 discusses situations where the contractor needs to obtain DOE approval prior to making a change in the facility or procedures. This section does not mention the need for DOE approval when changing the TSRs.

14. DELETION OF THE “MARGIN OF SAFETY” CRITERION

This comment pertains to Section 830.3 and Section H of Appendix A to Subpart B, as discussed in the proposed rule at 83 Fed. Reg. at 38990 and 38997.

SUMMARY

The Department is proposing to eliminate one of the criteria for when a change proposed by the contractor represents an unreviewed safety question, where DOE approval is needed. DOE stated that in implementation, this criterion was not providing a safety benefit. However, there potentially is a safety benefit to the concept, if the criterion were reformulated.

CONCERN

DOE is proposing to change the definition of an unreviewed safety question (USQ). DOE is proposing to remove situations where “a margin of safety could be reduced” from the definition. DOE’s rationale for doing so (83 Fed. Reg. at 38983) includes the observation that this change is in accordance with the Nuclear Regulatory Commission (NRC), which made the same change. DOE also stated that the “margin of safety” criterion is not providing a safety benefit. The term was being “subjectively interpreted” and “diverted safety resources”, and anyway it was rare for a situation to be determined to represent a USQ solely based on this criterion.

However, this lack of safety benefit does not necessarily support DOE’s proposed revision. The subjective interpretations mentioned by DOE could simply indicate that DOE did not clearly define how the “margin of safety” criterion was meant to be used. DOE Guide 424.1 has some guidance in Section A.1.7, but it is not clearly written. Furthermore, DOE’s description of the NRC rulemaking action is incomplete. The NRC (64 Fed. Reg. at 53594) also noted that “margin of safety” had been “the subject of differing interpretations” because the NRC’s rule (10 C.F.R. § 50.59) did “not define what constitutes a margin of safety”. However, the NRC did not simply delete the “margin of safety” criterion. The NRC’s notice continued, “The Commission continues to believe that changes representing a potentially significant decrease in certain margins should require NRC review and approval prior to their implementation.” The NRC considered which margins were important, and devised new criteria. The Department should consider performing the same evaluation.

DOE is also revising Appendix A to Subpart B (83 Fed. Reg. at 38997) to allow the contractor to make “editorial and format changes to its USQ procedure while maintaining DOE approval.” While the intent of this proposed revision raises no safety concerns, there could be difficulties in implementation where “editorial” changes actually change the substance of the procedure.

15. REFINING THE DEFINITION OF A FACILITY

This comment is pertinent to Section 830.3, as discussed in the proposed rule at 83 Fed. Reg. at 38988.

SUMMARY

The definition for a facility in the Rule could have the unintended consequence of allowing contractors to subdivide or partition a facility to avoid implementing controls to prevent or mitigate accident scenarios.

CONCERN

The rule defines safety structures, systems, and components (SSCs). As described in the safe harbors to the rule, such as DOE Standard 3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, one way safety SSCs are identified is through consideration of potential accident consequences. Safety class SSCs are considered when the consequences challenge the Evaluation Guideline.

Section 830.3 includes a general definition of the term ‘nuclear facility’. The definition does not preclude certain hypothetical practices in implementation that lead to avoidance of requirements for the identification of safety class SSCs. The definition includes the phrase “to the extent necessary to ensure proper implementation of the requirements established by this Part”, but the meaning of this phrase is ambiguous.

For example, a single facility with a high, mitigated dose consequence could conceivably be split into two separate facilities with completely separate Documented Safety Analyses (DSA). The combined facility may have required additional safety class controls, but the two separate facilities might not.

Another, and perhaps more likely, example is in the design of new facilities. A new facility could involve a cluster of modules adjacent to each other. If each module were declared a separate facility with a separate DSA, then safety class controls may not be required.

16. UPDATES TO SAFE HARBORS

This comment pertains to Table 1, as discussed in the proposed rule at 83 Fed. Reg. at 38994.

SUMMARY

Part 830 includes “safe harbor” methods that DOE contractors may use to prepare a documented safety analysis. In some cases, some attention or updating of the safe harbors may be warranted to ensure that they provide useful guidance for complying with the requirements of Part 830.

CONCERN

Reactors—Table 1 of the proposed Rule lists U.S. Nuclear Regulatory Commission Regulatory Guide 1.70, *Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants*, or successor document as a safe harbor for a DOE reactor. Reactors operated within the DOE complex are primarily research and test reactors. The regulatory framework for a power reactor (e.g., Regulatory Guide 1.70 and Regulatory Guide 1.206, *Combined License Applications for Nuclear Power Plants (LWR Edition)*) may be inappropriate for these type of reactors. Additional guidance from DOE could assist these research and test reactor facilities in appropriately applying a graded approach in developing safety basis documentation. Furthermore, the NRC website states that the NRC staff plans actions that will lead to Regulatory Guide 1.70 being superseded.

Onsite Transfers—Gaps exist in the safe harbor methodology, located in Table 2 of the current Rule and Table 1 of the proposed Rule, used for onsite transportation activities of radioactive materials. The current and proposed rule state that a contractor involved with transportation may prepare its documented safety analysis by utilizing DOE Order 460.1A, *Packaging and Transportation Safety*, and in DOE Guide 460.1-1, *Implementation Guide for Use with DOE O 460.1A, Packaging and Transportation Safety*, or their successor documents. The Order and its successors direct the conditions that require preparation of a Transportation Safety Document (TSD) for onsite radioactive material transportation activities. The Guide’s purpose, in part, is to clarify how to prepare that document. However, requirements in the Order and subsequent clarification in the Guide are not specific and can result in wide variance in the robustness of TSDs across the complex. In some cases, DOE contractors use the guidance found in other safe harbors, particular DOE Standard 3009, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*, to conduct transportation hazard and accident analyses due to their increased specificity compared to the transportation Guide.

While all of the safe harbors aim to provide acceptable methodologies for the development of documented safety analyses, the safe harbors for onsite transportation only provide a broad philosophy for developing this documentation, and little information prescribing

the implementation of that philosophy. For instance, the Guide states that the TSD should analyze transportation route hazards, but does not provide any requirement for a risk analysis—or other hazard analysis methodology—for the identified hazards. Compounding this lack of implementable methodology, the Guide includes only “should” statements rather than “shall” statements. The use of “should” statements can lead DOE contractors to not implement all the “should” statements found in the safe harbor because they are not interpreted as requirements. This interpretation effectively reduces the Guide contents of the safe harbor to optional guidance.

Additionally, this Guide does not clarify how to determine whether a hazard is effectively mitigated or prevented. The Guide states, “For hazardous materials, such as Type B radioactive materials, the transport system would be expected to prevent loss of containment both for normal handling and for all credible onsite accidents.” However, the Guide does not provide a definition of what constitutes a “credible onsite accident.” Moreover, unlike the safe harbor for stationary or permanent facilities (DOE Standard 3009), the safe harbor for onsite transportation does not discuss an evaluation guideline. This results in confusion and inappropriate use of evaluation guidelines from other sources, such as Department of Transportation regulations or DOE Standard 3009, but often without adhering to the same systematic accident analysis methods used in those sources.

AFFIRMATION OF BOARD VOTING RECORD

SUBJECT: Board Comments on 10 CFR 830 Revision

Doc Control#2018-100-072


The Board, with Board Member(s) Bruce Hamilton, Jessie H. Roberson, Daniel J. Santos, Joyce L. Connery *approving*, Board Member(s) none *disapproving*, Board Member(s) none *abstaining*, and Board Member(s) none *not participating*, has voted to approve the above document on October 4, 2018.

The votes were recorded as:

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIPATING*	COMMENT	DATE
Bruce Hamilton	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10/04/18
Jessie H. Roberson	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10/04/18
Daniel J. Santos	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10/04/18
Joyce L. Connery	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10/04/18

*Reason for Not Participating:

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Board Members.



Executive Secretary to the Board

Attachments:

1. Voting Summary
2. Board Member Vote Sheets

cc: Board Members
OGC
OGM Records Officer
OTD

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET

FROM: Bruce Hamilton

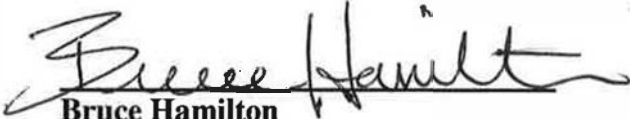
SUBJECT: Board Comments on 10 CFR 830 Revision

Doc Control#2018-100-072

Approved X **Disapproved** **Abstain**

Recusal – Not Participating

COMMENTS: **Below** X **Attached** **None**


Bruce Hamilton

 4 OCT 2018
Date

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET


FROM: Jessie Roberson

SUBJECT: Board Comments on 10 CFR 830 Revision

Doc Control#2018-100-072

Approved **Disapproved** _____ **Abstain** _____
Recusal – Not Participating _____

COMMENTS: **Below** _____ **Attached** _____ **None**



Jessie Roberson
Oct 4, 2018

Date

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET

FROM: Daniel J. Santos


SUBJECT: Board Comments on 10 CFR 830 Revision

Doc Control#2018-100-072

Approved X **Disapproved** _____ **Abstain** _____

Recusal – Not Participating _____

COMMENTS: **Below** _____ **Attached** _____ **None** X



Daniel J. Santos

10/4/18
Date

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET

FROM: Joyce Connery

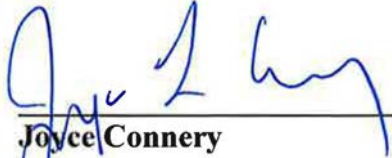
SUBJECT: Board Comments on 10 CFR 830 Revision

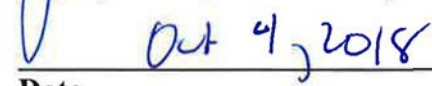
Doc Control#2018-100-072

Approved **Disapproved** **Abstain**

Recusal – Not Participating

COMMENTS: **Below** **Attached** **None**



Joyce Connery


Date