NRC FORM 680
(11-2002)
NRCMD 10.159

U.S. NUCLEAR REGULATORY COMMISSION

DIFFERING PROFESSIONAL OPINION

FOR PROCESSING USE ONLY

1. DPO CASE NUMBER: DPO-2006-005

INSTRUCTIONS: *Prepare this form legibly and submit three copies to the address provided in Block 14 below.*

2. DATE RECEIVED: 11/15/2006

3. NAME OF SUBMITTER	4. POSITION TITLE	5. GRADE
F. Burrows, M. Galloway, R. Shaffer, C. Tripp	Technical Reviewers and Branch Chief	14/15

6. OFFICE/DIVISION/BRANCH/SECTION	7. BUILDING	8. MAIL STOP	9. SUPERVISOR
NMSS/FCSS/TSB and RES/DFERR/ERA/IEEB	TWFN	T-8F42 T-10D20	M. GALLOWAY J. GIITTER W. KEMPER

10. DESCRIBE THE PRESENT SITUATION, CONDITION, METHOD, ETC., WHICH YOU BELIEVE SHOULD BE CHANGED OR IMPROVED.
(Continue on Page 2 or 3 as necessary.)

See attachment

11. DESCRIBE YOUR DIFFERING OPINION IN ACCORDANCE WITH THE GUIDANCE PRESENTED IN NRC MANAGEMENT DIRECTIVE 10.159.
(Continue on Page 2 or 3 as necessary.)

See attachment

12. Check (a) or (b) as appropriate:

☑ a. Thorough discussions of the issue(s) raised in item 11 have taken place within my management chain; or

☐ b. The reasons why I cannot approach my immediate chain of command are:

SIGNATURE OF SUBMITTER	DATE	SIGNATURE OF CO-SUBMITTER *(if any)*	DATE
Frederick H. Burrows	11/15/06	Melanie A. Galloway	11/15/06

13. PROPOSED PANEL MEMBERS *ARE (in priority order)*:

1. **Paul Loeser**
2. **Michael Waterman**
3. **Christopher Bajwa**

14. Submit this form to:

Differing Professional Opinions Program Manager

Office of:

Mail Stop:

15. ACKNOWLEDGMENT

THANK YOU FOR YOUR DIFFERING PROFESSIONAL OPINION. It will be carefully considered by a panel of experts in accordance with the provisions of NRCMD 10.159, and you will be advised of any action taken. Your interest in improving NRC operations is appreciated.

SIGNATURE OF DIFFERING PROFESSIONAL OPINIONS PROGRAM MANAGER (DPOPM)

Renée M. Pedersen

PRE-CONDITIONS MET: ☒ YES ☐ NO

DATE OF ACKNOWLEDGMENT: 11/20/2006

DIFFERING PROFESSIONAL OPINION
ATTACHMENT: NRC FORM 680

BLOCK 10

Describe the present situation, condition, method, etc., which you believe should be changed or improved.

NRC issued the Safety Evaluation Report (SER) for the United States Enrichment Corporation (USEC) American Centrifuge Plant (ACP) on September 11, 2006. Mandatory hearings will take place this fall and a decision on the license is anticipated by February 2007.

During the licensing review of the ACP, we identified that the facility's design and Integrated Safety Analysis (ISA) based on the facility design have not been completed to a sufficient level to conclude that all the requirements of 10 CFR Part 70 have been met. We agree with statements in the SER to the effect that the licensee has met the requirements to the extent possible for the available level of design, but believe that this level of design is not sufficient to meet the regulatory requirements for issuing a license.

We pursued the issues associated with the incomplete design and ISA during the on-site vertical slice reviews, and through several requests for additional information (RAI), meetings, and phone calls. The issues remained unresolved at the end of the review. In subsequent meetings, upper management and staff from the Office of General Counsel (OGC) stated that a complete facility design and ISA were not required because the licensing review was programmatic in nature. We stated that this was inconsistent with our understanding of the requirements of 10 CFR Part 70, and requested our management and OGC to provide us their position on what is required for licensing of a new fuel cycle facility.

Management then developed a Division of Fuel Cycle Safety and Safeguards (FCSS) policy memorandum dated August 4, 2006 (ML062160073). We believe that the policy contained in the memorandum, upon which both the licensing reviews of the Louisiana Energy Services (LES) and USEC facilities was stated to have been based, is inconsistent with the requirements of 10 CFR Part 70 and with the guidance in the "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility" (NUREG-1520). The policy memo quotes certain portions of 10 CFR Part 70, but does not consider all the applicable portions of the regulation, and as a result draws an erroneous regulatory conclusion. (Omitted portions of 10 CFR Part 70, discussed more fully in the memorandum dated September 13, 2006, include: (1) 10 CFR 70.66(a), which describes what provisions in Part 70 must be met before issuance of a license; (2) 10 CFR 70.61(b)-(e), which relates to the completeness of the ISA; and (3) 10 CFR 70.65(b)(4), which requires that the ISA Summary must contain information that demonstrates compliance with the performance requirements of 10 CFR 70.61.)

In a September 13, 2006, memorandum (ML062560233), we provided disagreeing comments on the policy to our management and have discussed the issue with them. In response, our management stated that our only option was to file a Differing Professional Opinion (DPO).

We believe that the staff should only issue a license to a new fuel cycle facility when it has been clearly demonstrated that the requirements of 10 CFR 70 have been met. Since we believe our

management's policy for licensing the USEC ACP and LES facilities is not consistent with the requirements of 10 CFR 70, our position is that either a policy needs to be developed that is consistent with Part 70 (e.g., through openly communicated guidance based on a well-thought out and rational interpretation of the regulations), or Part 70 needs to be changed to be consistent with management's policy. Similarly, a policy needs to be developed that is consistent with NUREG-1520 (e.g., through openly communicated guidance based on a well-thought out and rational interpretation of the regulations), or NUREG-1520 needs to be changed (e.g., through Interim Staff Guidance) to be consistent with management's policy.

Whatever the ultimate policy, it should be openly communicated to the public and should also be provided to the USEC Hearing Board so that it understands how the staff is interpreting the regulations.[1]

BLOCK 11

Describe your differing opinion in accordance with the guidance presented in NRC Management Directive 10.159.

The required elements are summarized on page 3 of the MD 10.159 Handbook. These are discussed below:

(a) A summary of the prevailing staff view, the existing management decision or stated position, or the proposed or established agency practice involving technical, legal, or policy issues.

The prevailing management position on the level of information (completeness of the design and ISA) needed for Part 70 licensing is documented in the enclosure to the August 4, 2006, policy memo (ML062160073). [Since there are two separate, yet interrelated, issues (completeness of the design and completeness of the ISA), we will address each issue separately.]

Completeness of the Design

The following excerpts from the enclosure to the August 4, 2006, memorandum represent the management's position on the level of completeness of the design necessary to issue a license (with our emphasis added by underlining):

> For licensing a facility under 10 CFR 70, technical information on the proposed equipment and facility must be provided in the application in accordance with 10 CFR 70.22(a)(7), which states that each application shall contain:

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[1]In a meeting with Jack Strosnider on November 9, 2006, we were informed that the August 4, 2006, policy memorandum, as well as the memoranda dated September 13 and October 19, 2006, will be provided to the USEC Hearing Board. The Board Notification, expected the week of November 13, 2006, should address this portion of our concerns.

"A description of equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property..."

The requirements for approval of an application are provided in 10 CFR 70.23(a). These requirements state that an application will be approved upon a finding that the applicant is qualified, the proposed equipment and facilities are adequate to protect health and minimize danger to life or property and the proposed procedures are adequate. As a technical matter, it is for the Office of Nuclear Material Safety and Safeguards to determine how final the design must be to make this finding.

In 10 CFR Part 70 licensing, the staff uses a reasonable assurance standard and focuses on the programmatic provisions of the applicant's proposed activities...This is also reflected in the various chapters of the standard review plan, NUREG-1520, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility." Based on this understanding, the licensing review needs to focus on the applicant's programmatic commitments and, consequently, the licensing decision is ultimately based on a sufficient level of detail to understand process system functions and functionally how items relied on for safety can perform their intended function and be reliable...The level of detail required for a licensing decision, therefore, does not require a final facility design...

Management then quotes from 10 CFR 70.32(k) in the enclosure:

"No person may commence operation of a uranium enrichment facility until the Commission verifies through inspection that the facility has been constructed in accordance with the requirements of the license."

This requirement applied through inspections, and not licensing reviews, will ensure that the programmatic commitments made by the licensee are properly applied to the as built facility. This inspection is intended to inspect the final design of the facility and the procedures that have been prepared to implement the licensee's commitments that are reflected in the license.

Completeness of the ISA

The following excerpts from the enclosure to the August 4, 2006, memorandum represent the management's position on the level of completeness of the ISA Summary necessary to issue a license:

The reasonable assurance standard is applied such that the staff decision pertains to a reasonable assurance that the integrated safety analysis summary is complete and the licensee will follow its integrated safety analysis approach and maintain it consistent with the regulations. The level of detail required for a licensing decision, therefore, does not require a final facility design or an absolutely complete identification of all items relied on for safety and accident sequences, but instead sufficient information has to be provided to understand the process and functions of items relied on for safety and reasonable assurance that the integrated safety analysis summary is complete.

The exact management position is difficult to determine, because the policy contradicts itself. First the policy memo states that the staff must have reasonable assurance that the ISA Summary is complete. Then it states that "an absolutely complete identification of all items relied on for safety and accident sequences" is not required. Because this is the exact type of information contained in the ISA Summary, this therefore implies that "an absolutely" complete ISA Summary is not required. The following sentence, however, again asserts that the staff must have reasonable assurance that the ISA Summary is complete. No further guidance is provided on the level of information required.

(b) A description of the submitter's views and how they differ from any issues discussed in item (a) above.

Completeness of the Design

Our view on completeness of design is that management has quoted from the correct regulations, 10 CFR 70.22 and 10 CFR 70.23, pertaining to the requirements for the design information needed for the staff's review. That is, a description of the equipment and facility used to ensure safety must be submitted with the application so the staff reviewers can determine that they are adequate.

During the USEC ACP licensing review, only roughly 15% of the instrumentation and control design was completed. It is our position that this represents a design that is not sufficiently complete and was not enough to determine that the instrumentation and control design was adequate to protect health and minimize danger to life or property. Although management's position, contained in the August 4 memo, states that "the licensing decision is ultimately based on a sufficient level of detail...", per verbal management direction, the applicant's commitments to industry standards and the inspections required by 10 CFR 70.32(k) to verify conformance to those commitments were used to determine ultimate adequacy in lieu of sufficient design detail. Although we did not agree with this approach and believed it represents a deviation from the established regulatory requirements of 10 CFR 70.22 (a)(7) and 10 CFR 70.23(a), we followed management direction and, based on the issuance of management's policy and verbal direction, we completed the input into the USEC ACP SER.

Also management implied that NUREG-1520 supports a licensing review that focuses on programmatic provisions in lieu of design details. To support our view that this is inaccurate, we provide the following quotes from the review guidance contained in NUREG-1520 pertaining to equipment needed for safety:

> The ISA documentation maintained onsite, such as system schematics and/or descriptive lists, should contain sufficient detail about items within a hardware IROFS, such that it is clear to the reviewer(s) and the applicant, what structure, system, equipment, or component is included within the hardware IROFS' boundary and would, therefore, be subject to management measures specified by the applicant. Some examples of items within a hardware IROFS are detectors, sensors, electronics, cables, valves, piping, tanks, dykes [sic], etc...The essential features of each IROFS should be described. Sufficient information should be provided about engineered hardware controls to permit an evaluation that, in principle, controls of this type will have adequate reliability.

Completeness of the ISA

Our view is that 10 CFR 70.66(a) states that the staff must make a finding that an applicant has met certain portions of 10 CFR Part 70 prior to a license being granted. These portions include 10 CFR 70.22(a)(7), 70.22(a)(8), 70.23(a)(3), and 70.23(a)(4), which require a description of the licensee's equipment, facilities, and procedures. In addition, these portions include 70.60 through 70.65, which require performance of an ISA. The performance requirements of 70.61, in particular, make it clear that the applicant must evaluate all credible events leading to a high- or intermediate-consequence event, and that all engineered or administrative controls needed to demonstrate the performance requirements must be identified as IROFS. 70.65 also states that the applicant must demonstrate its compliance with the performance requirements. This is also supported in Chapter 3 of the Standard Review Plan (NUREG-1520), which has numerous references to the level of detail required for the ISA Summary review (see the September 13, 2006, memo).

Based on these regulations, we conclude that the applicant must have performed a complete ISA Summary, and that the staff must find this meets 10 CFR Subpart H, before a license can be granted. Having a sufficiently complete design is a logical prerequisite to having a complete ISA, such that staff can determine the adequacy of failure modes and preventive and mitigative equipment and operator actions. This is because changes to the process or equipment could introduce new failure modes, selection or placement of equipment could affect safety system reliability, and so on. (The September 13, 2006, memo has a concrete example of this involving UF_6 cylinder cooling.) We agree that the staff must have reasonable assurance that the ISA Summary is complete, but conclude that this reasonable assurance cannot be achieved without a sufficiently complete facility design.

Per our understanding of the regulations and SRP, we consider the ISA Summary complete if the following criteria are satisfied:

- All credible accident sequences have been identified and evaluated.
- All IROFS needed to meet the performance requirements have been identified.
- The process is described in sufficient detail for the staff to understand the theory of operation and evaluate whether all credible sequences have been identified.
- The IROFS are described in sufficient detail for the staff to understand their safety function and to have reasonable assurance that they will perform their safety function commensurate with the level of likelihood assumed in the ISA Summary.

We also acknowledge that design is an evolutionary process and changes will have to be made as the facility is constructed. However, the staff cannot conclude that 10 CFR 70.66(a) has been met without having an ISA Summary that is complete at the time it is approved. If management considers the above framework too rigid for the licensing of new fuel facilities, then it always has the option of changing the rule or issuing an exemption. Our view is that the future licensing of fuel facilities should meet the above framework or else appropriate regulatory action should be undertaken openly to change the framework.

The memorandum dated September 13, 2006, contains a detailed analysis of our concerns with the prevailing management position. Because of the existence of this memo, we will merely summarize our concerns in bullet form below:

1. The policy memo is unclear and self-contradictory on the question of whether the staff must have reasonable assurance that the ISA Summary is complete. Twice the memo affirms this, but once (in the same paragraph) states that the ISA Summary does not have to be "absolutely complete." The memo does not explain the distinction between being "complete" and being "absolutely complete." Our view is that the regulations require that all regulatory requirements stated in 10 CFR 70.66(a) must be met before a license is issued. These requirements include those of 10 CFR 70.61 and 70.65, which require identification of all hazards, accident sequences, and IROFS, and demonstration that the IROFS are sufficient to meet the performance requirements. These conditions can only be met if the ISA Summary is complete. The level of detail needed should be as discussed in Chapter 3 of NUREG-1520, or an equally satisfactory alternative.

2. The statement in the policy memo that an "absolutely complete" identification of all accident sequences and IROFS is not necessary is inconsistent with the guidance of NUREG-1520 (as explained at length in the September 13, 2006, memo). NUREG-1520 makes it clear that the staff must make a determination that the ISA Summary is complete, which includes identification of all accident sequences and IROFS, and sufficient information to conclude that the IROFS are sufficient to meet the performance requirements.

3. The policy memo is also inconsistent in its references to 10 CFR Part 70 licensing reviews being programmatic in nature. The ISA review (required by 10 CFR 70.60 through 70.65) and review of the applicant's proposed equipment, facilities, and procedures (required by 10 CFR 70.22 and 70.23) are both technical in nature, and thus the statements about the review being programmatic in nature is incorrect. Although the policy stated that having a sufficient level of detail was the basis for the licensing decision, the policy and subsequent staff action was based on the supposition that licensing is based on programmatic elements such as commitment to industry standards. Because of this, the policy itself should be reevaluated.

4. Although the policy memo states that the licensing decision is ultimately based on a sufficient level of detail, it does not address the technical issue that having a sufficiently complete facility design is a logical prerequisite to having a complete ISA, such that staff can determine the adequacy of failure modes and preventive and mitigative equipment and operator actions. Otherwise, there is no assurance that all accident sequences and IROFS have been identified, or all IROFS are adequate.

5. The policy does not adequately consider all applicable portions of 10 CFR Part 70, and so draws an erroneous regulatory conclusion. As stated above, the additional portions that the policy should have considered include 10 CFR 70.66(a), 70.61(b)-(e), and 70.65(b)(4).

A detailed analysis of each point is contained in the September 13, 2006, memo.

(c) An assessment of the consequences if the submitter's position is not adopted by the agency.

1. The application of this policy to the LES and USEC facilities means that safety concerns may arise subsequent to issuing a license, as design decisions (more numerous than what would be expected from a facility licensed with a nearly complete design) are made and the facility is

constructed. The application of this policy to future fuel facilities could also lead to significant safety concerns there. First, because the policy is self-contradictory, there is no guarantee as to how it would be applied in the future. Secondly, without a sufficiently complete facility design, it is obvious that all accident sequences have not been identified and all needed IROFS have not been established; thus, new hazards will arise or new controls will be established, as the facility is constructed. These may or may not be adequate. We would therefore not have the same level of reasonable assurance of adequate protection as we would if we were confident that the ISA Summary was complete and based on a nearly complete design. The assurance of safety is thus less than it would be if we followed Part 70 and NUREG-1520.

2. The NRC will not meet its Strategic Goal of Openness. The Code of Federal Regulations and Agency guidance (e.g., NUREG-1520) are made publicly available to foster open and accountable regulation. If a particular licensing action requires deviating from these norms, then the Agency has a responsibility to disclose this fact and the reasons for it. Allowing this policy to govern future licensing actions means that we will be licensing new fuel facilities in a way contrary to promulgated regulations and guidance, without taking acceptable regulatory actions if alternatives are warranted (e.g., rulemaking, exemptions, enforcement discretion, license conditions, compensatory measures). In the case of USEC, this means that we will create the false impression that a sufficient design was reviewed and judged to be adequate, and all accident sequences and IROFS have been identified--i.e., that the ISA Summary is complete--when we know that it is not.

3. The SER will not provide an accurate representation of the technical review. The SER discusses the incomplete nature of the design in several sections, but does not state decisively whether all the requirements of 10 CFR 70.66(a) have been met. The SER had terminology removed from it that addressed the fact that certain key aspects of the facility design had not been sufficiently completed (e.g., means of controlling enrichment, method for cooling liquid UF_6 cylinders, safety-related instrumentation and control systems), and that this was likely to result in identification of new accident sequences and new IROFS subsequent to the review. Thus, the SER tends to downplay the incomplete design issue. The effect of the incomplete design on the licensing decision is not discussed in the SER in detail and is only discussed in the policy memo of August 4, 2006. Also, management had indicated that it would not proactively provide the policy memo to the Hearing Board, but would only make it available if the Hearing Board requests it.[2] The consequence of not discussing the licensing impact of the incomplete design in the SER, and (2) not proactively providing the policy memo to the Hearing Board means that a significant issue that dominated the last several months of the review, and describes the underlying basis for the licensing of this facility, would not have be brought to the Board's attention. The Hearing Board would have been in the position of having to make a decision without having all material information, positive and negative, at its disposal. This policy is central to the decision of whether an appropriate review has been completed to support issuance of a license.

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[2]See footnote on page 2 for resolution of concerns over providing the policy to the USEC Hearing Board.

(d) The names of three potential ad hoc panel members, listed in priority order, or a statement that he or she will not provide names of potential ad hoc panel members.

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(e) Copies of relevant documents referenced in the DPO that are available in ADAMS should not be attached to the DPO. The submitter should include only titles and accession numbers for such relevant documents, along with a brief statement regarding the relevance of the document to the issue being raised.

List of relevant documents:

1. August 4, 2006, policy memo (ML062160073). This states the prevailing licensing policy of FCSS management, which is the subject of this DPO.

2. September 13, 2006, memo (ML062560233). This documents the final discussions of this issue between Frederick Burrows and Christopher Tripp and FCSS management, and contains a detailed analysis of the issues involved in this DPO.

3. USEC SER, NUREG-1851 (ML062490543). This version of NUREG-1851 is the publicly available version of the SER. The discussion of the state of the USEC design is in Appendices C and E of the SER, which are marked OUO-DOE/NOFORN, and are therefore not in ADAMS. This discussion, found in the conclusion sections of these appendices, contain the background and context for this DPO.

4. NRC Strategic Plan, FY2004-2009. This document contains strategic goals and values (e.g., openness) that were not adhered to in the August 4, 2006, policy memo, and in the process used to develop and issue it, as explained under item (c) above. Such a significant policy as determining the level of information needed, and the review process to be followed, for licensing new fuel cycle facilities should have been developed openly with full staff and management involvement.

5. October 19, 2006, memo (ML062900185). This documents additional issues related to the review policy and the process that was used to develop it.