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MEMORANDUM TO: Jacob Zimmerman, Deputy Director
Division of Fuel Management
Office of Nuclear Material Safety and Safeguards

THRU: Damaris Marcano, Chief  Signed by Marcano, Damaris
on 07/31/23
Containment, Thermal, Chemical and Fire Branch
Division of Fuel Management
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FROM: Chris Bajwa, Senior Mechanical Engineer  Signed by Bajwa, Ch
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SUBJECT: RECOMMENDATIONS FOR IMPROVEMENTS TO THE
QUALIFICATION PROGRAM IN THE DIVISION OF FUEL
MANAGEMENT

Background

The Division of Fuel Management (DFM) is responsible for Fuel Facilities and Spent Fuel Storage and Transportation business lines (BLs). Over the last year, as with many other organizations within the Agency, DFM has significantly increased the hiring of entry and junior level staff across both BLs for a variety of positions including technical reviewers, project managers (PMs), and inspectors, among other positions. In order to make contributions to safety or environmental reviews or participate in inspections, these new DFM staff members need to be qualified.

In addition, in October 2021, an assessment was made of the 2019 merger of the two BLs within the division. This assessment identified that further attention was needed to address the staff qualification programs and it specifically highlighted the need to standardize the qualification program across BLs, as much as possible. The assessment further highlighted the fact that the DFM staff participating in a qualification program at the time of the merger were using a variety of sources which included (in some cases) draft qualification journals, some of which contained outdated information or references. The assessment also noted that some staff experienced variations in 1) expectations for proficiency, 2) composition of their qualification boards, and 3) the qualification process (e.g., some more experienced staff were given exemptions from completion of a formal qualification board while others were not).

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Considering the results of the 2021 assessment, and recent increases in hiring in DFM, it is clear that an efficient and effective qualification program is a vital component to successful completion of the work of the Agency in the area of these two BLs.

In order to address this challenge, the staff proposed standing up a Qualifications Working Group (QWG) to address both the near and far term challenges related to staff qualification within DFM. The QWG was chartered on October 7, 2022, (Agencywide Documents Access and Management System [ADAMS] Accession No. [ML22258A286](#)) and has since completed two “Tasks” in accordance with its charter.

The QWG’s Task 1 was to: “define the scope of challenges in the qualification process” and the working group found that program was generally successful in ensuring that Technical Reviewers, PMs, and Inspectors (in both BLs) were able to be appropriately qualified to carry out their work of ensuring safety, which serves to strengthen public confidence in the work done by the staff.

The QWG also found that, while the qualification process in DFM could be improved, the information and knowledge sources needed for individuals to complete their qualifications were largely captured in the applicable appendices to the U.S. Nuclear Regulatory Commission (NRC) Inspection Manual Chapter (IMC) 1246, “Formal Qualification Programs in the Nuclear Material Safety And Safeguards Program Area,”; however, most of the appendices (which are referred to henceforth as “Qual Cards”) were outdated and some were in a format that was inconsistent with other NRC qualification programs. Despite this, staff have been able to take advantage of the numerous resources available to them to achieve the level of knowledge necessary for qualification.

The Task 1 closure memo, dated December 7, 2022, ([ML22341A089](#)) provides further detail of the working group’s findings under this task.

Task 2 was to: “Review the existing qualification program processes, practices, and materials...” and the working group found that there are numerous resources available to staff to aid in the qualification process including: the regulations that govern each of the review/inspection areas (Title 10 of the *Code of Federal Regulations* (CFR) Parts 40 and 70 to 73), written guidance for the various review areas (i.e., Standard Review Plans, Division Instructions (DIs), or other guidance documents and/or technical reports), “handbooks” created by staff for specific job functions, videos of formal and informal training sessions, and numerous SharePoint and Nuclepedia pages which provide additional specific (historical) information.

In addition, it was recognized that there are numerous avenues for gaining applicable and appropriate knowledge during the qualification process. Some of these include (but are not limited to) the following:

- Formal training, both internal (i.e., through the NRC Talent Management System) or external
- Self-Study (Including review of Nuclepedia and available video libraries)
- On-the-Job Training (OJT)
- Mentoring, Internal Seminars and Technical fora (i.e., Lunch-and-Learns, Knowledge Management seminars, or the Office Nuclear Regulatory Research (RES) seminars)
- External Conferences or Technical Meetings, both domestic and international (e.g., meetings and/or conferences sponsored by the American Society of Mechanical

Engineers, Nuclear Energy Institute, Institute for Nuclear Materials Management, Electric Power Research Institute, etc.)

- Internal NRC meetings
- Shadowing of senior staff, and
- Rotations (both internal to the NRC and external to other Organizations).

Based on the QWG's review of current qual journals, it was concluded that most of the qual journals used by the DFM staff, whether generic or role specific, needed updates.

Finally, the QWG believes that continued refinement of the DI ADM-FM-5 should be made throughout the effort to review the DFM qualifications process, with recommended process changes and updates to qualification procedures being captured in subsequent revisions of ADM-FM-5.

The Task 2 closure memorandum, dated January 11, 2023, ([ML22364A288](#)) summarizes the working group's findings under this task.

Introduction

DFM "owns" 8 qualification journals (qual journals) in the appendices of [NRC Inspection Manual Chapter](#) (IMC) [1246](#), including: **B1** Spent Fuel (SF) PM and Tech Reviewer, **B2** SF Inspector, **B3** Independent Spent Fuel Storage Installation (ISFSI) Inspector, **C1** Fuel Cycle (FC) Tech Reviewer, **C2** FC PM, **C3** Material Control and Accountability (MC&A) License Reviewer, **C4** FC Physical Security Inspector, **C5** International Safeguards (SG) Analyst.

In general, the NRC Qualifications vary in content and level of detail (e.g., most cover Allegations and 10 CFR Part 20, while some go further into topics like the NRC history and the Differing Professional Opinion Program). The qualification ("qual") journals found in IMC [1248](#) and IMC [1247](#), also include the NRC Quals with varying content and level of detail.

For DFM, BL Quals cover topics including parts of 10 CFR, Management Directives, Guidance Documents, and required training. These topics are unique to the BL but are generically applicable to all staff working in that area (e.g., the qual journal for SF technical reviewers covers 10 CFR Part 70, 71 and 72, the International Atomic Energy Agency transportation guidance, generic communications regarding transportation, etc.).

Role Specific Quals for technical reviewers in DFM have minimal overlap. That said, there are some areas across disciplines (e.g., welding quals for Spent Fuel Materials and Structural reviewers) or with similar disciplines across BLs (e.g., SF and FC Structural reviewers).

In general, the QWG agreed that the appropriate means to gain knowledge in each topical area for qualification include (but are not limited to):

- Formal training – both internal [Agency Talent Management System (TMS)] and external (SF-182)
- Internal Seminars and Technical Discussions
- External Conferences or Technical Meetings
- Self-Study
- OJT

- Mentoring
- Shadowing senior staff
- Rotations, etc.

Working Group Recommendations

The recommendations developed by the working group are presented in the table below and each recommendation has been assigned a priority (High, Medium, or Low) and a Level of Effort (LOE) estimate (High, Medium, or Low) as determined by the working group in consultation with DFM management. The ranges for the LOE estimates (in hours) are provided in the notes to the table. Further, the first major recommendation on revising and updating the various “Qual Cards” for all applicable qualifications in the division is provided with supporting recommendations to be considered for implementation during updating/revising the Qual Cards.

Recommendation	Priority (High, Medium, or Low)	Level of Effort ¹ (High, Medium, or Low)
<p>The following Appendices to IMC 1246 should be revised and updated:</p> <p>B1, Training Requirements and Qualification Journal for Spent Fuel Storage and Transportation Technical Reviewer and Project Manager</p> <p>B2, Training Requirements and Qualification Journal for Spent Fuel Storage and Transportation Inspector</p> <p>B3, Training Requirements and Qualification Journal for Independent Spent Fuel Storage Installation Inspector</p> <p>C1, Training Requirements and Qualification Journal for Fuel Cycle Technical Reviewer</p> <p>C2, Training Requirements and Qualification Journal for Fuel Cycle Project Manager</p> <p>C3, Training Requirements and Qualification Journal for Material Control and Accounting License Reviewer</p> <p>C4, Training Requirements and Qualification Journal for Fuel Cycle Safeguards Physical Security Inspector</p> <p>C5, Training Requirements and Qualification Journal for International Safeguards Analyst</p>	High	High ²

The following recommendations should be considered during the updates/revisions to the IMC 1246 Appendices listed above:

- A. The Qual journals should be broken down into four parts: the NRC-wide Quals, Office-wide (NMSS) Quals, Business Line Quals, and Role Specific Quals.
- B. Consider revising DFM qual journals to follow a more detailed format in line with inspector qual journals and more recent qual journals throughout the office and Agency. (See Note below)
- C. Consolidate the NRC-wide qual requirements across all DFM qual journals, or at least have consistent content for the NRC Quals in DFM qual journals.
- D. Remove content that overlaps with any Office of the Chief Human Capital Officer (OCHCO) required training that is on qual cards (e.g., any recurring yearly training such as IT security or Allegations training).
- E. Consolidate (and update) any Office-level quals into a single (standard) set across all DFM qual cards.
- F. As updates to Role Specific Quals are completed, identify which quals (if any) might be candidates for potential consolidation, consistency, and/or cross-qualification.
- G. Consider whether the FC reviewer qual journal should include cards for specific disciplines. (Note: There is a Role Specific Qual for FC PMs (IMC 1246 App C2); however, Spent Fuel PMs are simply required to complete the NRC, NMSS, and Spent Fuel Transportation and Storage quals (IMC 1246 App B1 cards 1-8)).
- H. In general, qualification cards should allow for proficiency in the most relevant and important information in the area of qualification (i.e., “need to know”), with information considered “nice to know” but that is not vital to the qualification being sought, relegated to additional resources or provided as references in the respective qual cards.

Recommendation	Priority (High, Medium, or Low)	Level of Effort ¹ (High, Medium, or Low)
In order to find the necessary information resources required for completion of qual cards, a listing with appropriate links to any and all resources needed should be provided in one place (i.e., a SharePoint or Nuclepedia page)	High	Med/High
Update Qual Cards to a “detailed” format ³	High	Med/High
Develop a recommendation on how to handle the qualifications for Transport Safety Specialist/Subject Matter Experts (SME) in DFM	High	Med
Branch Chiefs are encouraged to delegate qual card signoffs to other Senior Staff or SMEs, as appropriate.	Med	Low
Additional guidance should be developed and provided (via the DI ADM-FM-5) on “grandfathering” of staff for qualification	Med	Low
The DFM qualifications program should be reviewed on a periodic basis (with qualification card updates not to exceed once every 5 years) to ensure that it remains efficient and effective and meets the staff and Agency’s needs with regards to providing qualified staff to complete safety reviews and inspections.	Med	Low

Recommendation	Priority (High, Medium, or Low)	Level of Effort ¹ (High, Medium, or Low)
Any “draft” qualification cards relevant to the qualification of the DFM staff that have <u>not yet been issued</u> should be identified, reviewed, and then considered during the updates/revisions to <u>existing</u> qual cards. Note: These drafts may either be incorporated into existing qual cards or issued as “stand alone” qual cards.	Med	Low
Develop an IMC 1246-specific “Industrial Safety Course” by assembling the appropriate existing training Modules from TMS (with the assistance of specialized technical training experts from the Technical Training Center (TTC)).	Med	Low
Align staff qualifications with TMS so that there is a reliable, permanent, and easily accessible record of DFM staff qualifications.	Med	Low
Guidance on how to consider qualifications from other organizations should be updated and examples provided in the DI ADM-FM-5 in order to ensure consistency in this qualification pathway for all the DFM staff.	Med	Low
Notes		
<p>¹ For level of effort, High = greater than 500 hours, Medium = between 250 and 500 hours, Low = between 0 and 250 hours</p> <p>² This LOE estimate is for updating and revising ALL the IMC 1246 Appendices applicable to DFM as listed above. The LOE estimates for the individual applicable Appendices may be found in Append A to this memo.</p> <p>³Most DFM qual journals follow a summary format that simply lists documents, trainings courses, and on-the-job training activities with a letter indicating the level of knowledge expected. Many other qual journals follow a detailed format that provides a Purpose, Level of Effort in hours, References, Evaluation Criteria, and Tasks for each qual card. The detailed format provides several advantages over the summary format: greater consistency to the quals; greater clarity in the expectations for qualify staff; and less required preparation on the part of the supervising staff. Five DFM qual journals already follow a detailed format: B2 Spent Fuel Inspector (Under revision as of FY23), B3 ISFSI Installation Inspector (Under revision as of FY23), C2 FC PM (Updated 2011), C3 MC&A License Reviewer (Updated 2011), and C5 International SG Analyst (Updated 2016) Other areas that have moved to a detailed format include: all inspector quals reviewed by the Working Group (WG), some technical reviewer quals, and all recently updated quals examined (i.e., 2013 is the latest summary format qual journal found).</p>		

Staff Qualification “Best Practices”

The QWG considered “best practices” from qualification processes both external to DFM, including those of the Office of Nuclear Reactor Regulation (NRR) and external to the NRC, including the National Aeronautics and Space Administration. In considering how to apply “best practices” to the DFM qual program, the QWG has the following recommendations:

- Sessions such as “Lunch and Learns”, given by senior staff and/or SMEs, should be provided to staff, and these sessions tied to specific “sign offs” on qual cards in order to provide opportunities for staff in the qualification process to receive information relevant to the “sign offs” on their qual cards.
- The Nuclepedia platform should be utilized to allow staff to easily find SMEs on topics that are related to their qualification process. Nuclepedia’s SME lists and other qualification-related content should be easily accessible to the DFM staff.

Cross-Office Staff Qualifications

The working group concluded that “Cross-Office” qualifications were not achievable given the specific technical issues that review staff in DFM address and that, at the present moment, there is not currently enough overlap with other NRC (non-NMSS) technical disciplines to successfully implement this idea.

Overall Conclusions

The QWG generally found that, while the qualification process in DFM could be improved, the information and knowledge sources needed for individuals to complete their qualifications were largely captured in the applicable appendices to IMC 1246. The QWG further found, based on the review of the current “Qual Cards” and some of the associated study material, that most of the Qual Cards used by the DFM staff, whether for generic or role specific qualifications, needed updates.

The QWG believes that the DI ADM-FM-5, “Administrative Process for Qualification,” is a succinct summary of the DFM qualification process and should be provided to staff as a guide for the qualification process. As a result, the final draft of this DI will be placed into the concurrence process in conjunction with issuance of this memorandum. The QWG recommends that the DI should be revisited on a regular basis and any changes deemed necessary should be made throughout the effort to review the DFM qualifications process, with recommended process changes and updates to qualification procedures being captured in subsequent revisions of ADM-FM-5.

The QWG also notes that during the review of the DFM Qualification Program, work was already underway on the revisions of IMC 1246 Appendices B2: “Training Requirements and Qualification Journal for Spent Fuel Storage and Transportation Inspector,” and B3: “Training Requirements and Qualification Journal for Independent Spent Fuel Storage Installation Inspector,” both of which will soon enter concurrence. In addition, as part of the QWG review effort, many branches in DFM have already assessed the LOE necessary to update the various Appendices of IMC 1246 that apply to their areas of work.

Implementation of the recommendations in this memorandum will require a significant effort; however, the QWG strongly encourages the DFM management to dedicate the resources necessary to implement the recommendations provided in this memorandum. Existing technical support contracts may provide additional resources that could complement the implementation activities by utilizing contractor staff working in collaboration with DFM SMEs.

Acknowledgements

The QWG would like to thank the following DFM staff for their assistance to the working group in our review of the Qualifications program, in general, and, specifically, for their expert review of

the individual "Qual Cards" appended to IMC 1246 (listed below) to provide resource estimates for their revision: Nishka Devaser, Aaron Thomlinson, Nathan Audia, Stephen Poy, Glen Tuttle, and Eduardo Sastre.

Enclosures:

1. Examples of Specific Updates Recommended for the NRC Inspection Manual Chapter IMC 1246 Appendices with Level of Effort Estimates
2. Division of Fuel Management Qualifications Program Review/Update/Revision DRAFT Project Plan
3. Communication Plan: Office of Nuclear Materials Safety and Safeguards, Division of Fuel Management Qualifications Working Group

SUBJECT: RECOMMENDATIONS FOR IMPROVEMENTS TO THE QUALIFICATION PROGRAM IN THE DIVISION OF FUEL MANAGEMENT

DOCUMENT DATE: July 31, 2023

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**Examples of Specific Updates Recommended for
the NRC Inspection Manual Chapter 1246 Appendices with Level of Effort Estimates**

Provide “highlights” of the specific changes that are needed to the individual qual cards. Resource estimates for what needs to be done (high level) to be provided also.

The NRC Inspection Manual Chapter (IMC) 1246 Appendix **B1**: Spent Fuel Project Manager (PM) and Tech Reviewer (Level of Effort (LOE) estimate: 300 Hours)

- Move the H-308S “Transportation of Radioactive Material” course into the B1 card (from B2)
- Separate out the PM and Tech Reviewer quals into separate qual cards (**B1a/b** ?)
- All cards in Appendix B1 need to be updated (e.g., current equivalent versions of defunct documents and trainings) and put into a detailed format (e.g., add evaluation criteria).
- Card 1 is the U.S. Nuclear Regulatory Commission (NRC)-wide material and could be replaced by the Office of the Chief Human Capital Officer (OCHCO) new employee training.
 - 1 person-hour to compare new employee training to card material and confirm elimination.
- Cards 2 through 8 are the Division of Fuel Management (DFM) material and could be updated by a small team.
 - Card 2 should be developed into 3-6 cards.
 - Card 3 should be developed into 0-2 cards. Some content could be cut for OCHCO training.
 - Card 4 should be developed into 5-9. Some content could be cut.
 - Card 5 should be developed into 11-22. Some of the Information Notices could be cut.
 - Card 6 is just site access training. Cut.
 - Cards 7 and 8 are just On-the-Job-Training. Should be kept with some updates/reformatting/cutting.
 - We could turn this into something like 30 detailed cards.
- Cards 9A through 9F are discipline specific material and could be updated by an individual in each discipline (six people).
 - Card 9A has seven items.
 - Card 9B has 10 items.
 - Card 9C has six items.
 - Card 9D has 11 items.
 - Card 9E has 12 items.
 - Card 9F has 10 items.
 - None of that includes their chapter of the Standard Review Plans (NUREG-0800) (SRPs) strangely. SRPs should be moved out of the DFM portion into each discipline.
 - We could turn this into something like 60 detailed cards across all disciplines.

IMC 1246 Appendix **B2**: Spent Fuel Inspector (LOE Estimate: 200 Hours)

(NOTE: this Appendix is currently being updated and revised by the Inspections and Operations Branch in DFM)

- (From A. Thomlinson, Inspector): Move the H-308S “Transportation of Radioactive Material” course into the B1 qual card (from B2).
- Update required Training to reflect current training offerings

- Update and replace outdated references and links
- Change from a card style qualification and look more similar to B3.
- Model Basic Qualification after B3 and create the appropriate technical qualifications.
- Create a Consolidated Interim Storage Facility (CFSI) integrated safety analysis (ISA)

IMC 1246 Appendix **B3**: Independent Spent Fuel Storage Installation, Installation Inspector (LOE reported: 180 Hours)

(NOTE: this Appendix was updated and revised (by Nathan Audia) in June 2023)

- Update required Training to reflect current training offerings
- Update Incident Response individual study activities (ISAs) to reflect the current program
- Update and replace outdated references and links (Each ISA is impacted)
- Create CFSI ISA
- Update supporting text in the Appendix outside of the ISAs to reflect the current state of the program

IMC 1246 Appendix **C1**: Fuel Cycle (FC) Tech Reviewer (LOE estimate: 80 Hours)

- All cards in Appendix C1 need to be updated (e.g., current equivalent versions of defunct documents and trainings) and put into a detailed format (e.g., add evaluation criteria).
- Evaluation criteria needs to be added to Qualification Guides 2, 4, 5, 6, 7, and 9.

IMC 1246 Appendix **C2**: FC PM (LOE estimate: 16 Hours)

- References to the following terms in the Appendix need to be revised and/or updated:
 - “Office mail”
 - Employee Mentoring Program
 - Fuel Cycle Safety Team
 - “Internal web site” - document collections now reside on SharePoint
 - Licensing Support Network (for the high-level waste repository)
 - FCSS
 - Ticket Tracking System
 - “Director’s Greeting”
 - PM Handbook (replaced by references to the Division Instructions)
 - “Technical Assignment Control” and the “License Action Tracking System”
 - “Technical Support Branch”
 - NMSS Inspection Manual Chapter Coordinator
 - IMCs 2682 and 2683

IMC 1246 Appendix **C3**: Material Control and Accountability (MC&A) License Reviewer (LOE estimate: 80 Hours)

- Update required training and core license reviewer training to reflect current NRC and NMSS policies and practices.
- Update MC&A training to reflect current MC&A practices, references, and guidance.
- Update specialized training to reflect current training courses that are necessary and are available.

IMC 1246 Appendix **C4**: FC Physical Security Inspector (LOE estimate: 80 Hours)

- All cards in Appendix C4 need to be updated (e.g., current equivalent versions of defunct documents and trainings) and put into a detailed format (e.g., add evaluation criteria).
- Evaluation criteria needs to be added to Qualification Guides 2, 4, 5, 6, 7, and 9.

IMC 1246 Appendix **C5**: International SG Analyst (LOE estimate: 80 Hours)

- Referenced documents need to be updated. Some are not relevant or outdated.
- Some of the questions across the card seem to be redundant and inconsistent.
- Some of the cards might be unnecessary and could be removed.