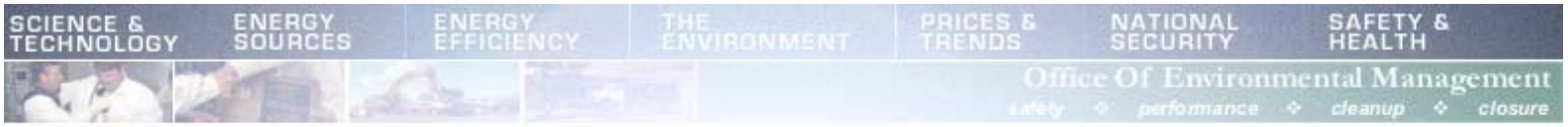
EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

DOE Packaging Certification Program



U. S. Department of Energy

Office of ENVIRONMENTAL MANAGEMENT

Office of Safety Management and Operations

EM-45

STORAGE CASK CERTIFICATION PROGRAM PROTOCOLS AND PROCESSES

Revision 0

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APPROVALS

Issued By: _____ Date: _____

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Approved By: _____ Date: _____

Manager, EM-45 Office of Safety Management and Operations

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STORAGE CASK CERTIFICATION PROGRAM PROTOCOLS AND PROCESSES

1. Purpose

A key function of the Office of Safety Management and Operations (EM-45) is development and implementation of an appropriate Storage Cask Certification Program (SCCP) for the Office of Environmental Management (EM). The SCCP supports protection of people, the environment and property from the potential consequences of independent storage of spent nuclear fuel (SNF), high-level radioactive waste (HLW), and greater-than-class-C (GTCC) waste at DOE sites. The DOE SCCP, through the DOE Packaging Certification Program (PCP) and Headquarters Certifying Official (HCO), will certify all storage casks used to store SNF, HLW, and GTCC at DOE sites. The program addresses the needs for robust casks providing containment under credible conditions.

The operating protocols and processes of the PCP establish roadmaps for the technical and management efforts involved in certifying DOE radioactive casks designs and managing the DOE fleet of storage cask hardware.

NUREG-1536, Revision 1A, *Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility*, provides guidance for reviewing applications for a Certificate of Compliance of storage casks used at a dry storage system. This NUREG is intended to provide a consistent application content and regulatory review of storage cask safety analysis reports.

2. Scope

The Assistant Secretary for Environmental Management (EM-1) has delegated the Deputy Assistant Secretary for Office Management and Operation or Deputy Assistant Secretary for Technical and Regulatory Support (EM-45) as the Headquarters Certifying Official (HCO) for certifying storage casks. Reporting directly to the HCO is the Manager of the PCP. The DOE PCP will review the Safety Analysis Report for Storage Cask (SARSC), issue questions as needed to applicants, prepare the DOE Safety Evaluation Report (SER), and issue storage casks CoC's. DOE PCP authority to issue DOE CoC's comes from 49 CFR 173,7(d) and DOE Orders. The DOE PCP is equivalent to the NRC regulatory process and is well known, documented, and

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accepted by the NRC and DOT. For the purpose of this document, the DOE may assume those responsibilities of the NRC identified in 10 CFR Part 72.

The PCP is structured to provide storage cask certification services for DOE-wide. The PCP certifies radioactive materials storage casks for all of DOE, except Naval Nuclear Propulsion Program, the Office of Civilian Radioactive Waste Management, activities regulated through a Nuclear Regulatory Commission (NRC), or States under an agreement with the NRC, and certain National Nuclear Security Administration materials.

The PCP Team consists of the HQ Program Manager and his support team. The PCP through its contractors {Argonne National Laboratory (ANL), Lawrence Livermore National Laboratory (LLNL), Oak Ridge National Laboratory (ORNL), Savannah River National Laboratory (SRNL), and Eagle Research Group, Inc., performs multiple functions to support storage cask certification. The PCP manager integrates closely with all the DOE sites storage cask programs.

Within this scope, the PCP support activities include:

- Reviewing Safety Analysis Reports for Storage Casks (SARSC) and approval/certification for storage casks used to store nuclear material at DOE sites in accordance with DOE and NRC requirements.
- Maintaining and updating the RAMPAC website and database of certified radioactive storage casks.
- Review and accept NRC certified storage casks and maintain User register for DOE and NRC storage casks CoC's
- Implementation of 10 CFR 72 Subpart G mandated Quality Assurance requirements for SARSC applicants and Certificate of Compliance holders, including assessment and appropriate training.
- Training and guidance for preparation of required documentation, development of conforming quality assurance programs, and proper interpretation of applicable ASME codes.

Storage casks with current certification by the NRC for the contents in DOE storage will be accepted by the DOE.

3. Major Deliverables

The PCP supports a number of Level 1 and Level 2 milestones from EM. As work progresses, the PCP manager monitors deliverables and the performance of contractors, in terms of both cost

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and schedule.

These milestones are negotiated between senior EM management and the sites. Changes to Level 1 and Level 2 milestones must also be negotiated and require authorization from senior EM management and the sites through the EM change-control process. The lower-level milestones at the sites can be changed by site management after proper coordination with other interfacing sites, provided these changes do not impact the Level 1 and Level 2 milestones at any site. Budget and scope changes for the current FY are executed through work authorizations.

The major FY deliverables and the sites responsible are tracked in the PCP quarterly schedule. Site points of contact include:

SRNL	Steve Bellamy, steve.bellamy@srnl.doe.gov, Jeff England, jeffery.england@srnl.doe.gov,	803-725-1083 803-725-4762
LLNL	Al DiSabatino, disabatino1@llnl.gov,	925-422-4046
ANL	Yung Liu, yyliu@anl.gov,	630-252-5127
ORNL	Cecil Parks, parkscv@ornl.gov,	865-574-5280

4. Storage Cask Certification Processes

Nuclear material storage cask certification is a required and critical element for independent spent fuel storage installations (ISFSI) storing SNF, HLW, and GTCC waste at DOE sites. To carry out this mission objective, multi-disciplinary and highly technical capabilities (e.g., structural engineering, nuclear physics, and fire dynamics) are required to assist applicants, support standard developments, review and certify SARSC's with a high degree of confidence. The following EM laboratories provide these services and work closely with the PCP manager to support PCP storage cask certification:

Savannah River National Laboratory (SRNL),
Lawrence Livermore National Laboratory (LLNL),
Argonne National Laboratory (ANL) and
Oak Ridge National Laboratory (ORNL).

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4.1 Payment for SARSC Review

EM-45 requires funding for services before conducting any SARSC review. The applicant must provide funding for each SARSC review. EM Field Offices will be charged only if SARSC work is outside of the baseline submitted to EM-45 and approved by the Change Control Board (CCB). However, these EM Field Offices may request associated project funding through EM-45 via the CCB. Additional SARSC-related scope needed by EM Field Offices should be processed through the CCB.

Funding for SARSC reviews, including addenda, revisions, etc., shall be transferred using the financial plan to the appropriate National Laboratory as directed by the PCP Manager. A statement to this effect shall be submitted to EM-45 in the application for SARSC review or by memo. No work will be conducted on the SARSC until funding is received by the National Laboratory.

For perspective, a fair estimate of the cost of a new SARSC review is $1M. Prior work on the same SARSC should reduce the cost. If the cost exceeds the allocated amount of funding, then all work will stop until the National Laboratory receives the necessary funding supplement. Upon completion of the review activities, the applicant may recover any unused funding.

The applicant should contact the PCP manager to discuss funding requirements, estimates for SARSC reviews and additional work from EM-45. The information presented in this section is also available from the RAMPAC website.

4.2 SARSC Submittal Guidelines

10 CFR Part 72, *Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater than Class C Waste*, provides the regulations to establish requirements, procedures, and criteria for the issuance of licenses to receive, transfer, and possess power reactor spent fuel, power reactor-related Greater-than-Class C waste, and other radioactive materials associated with spent fuel storage in an independent spent fuel storage installation and the terms and conditions under which the NRC will issue these licenses. The regulations in this part also establish requirements, procedures, and criteria for the issuance of licenses to the DOE to receive, transfer, package, and possess power reactor

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spent fuel, high-level radioactive waste, power reactor-related GTCC waste, and other radioactive materials associated with the storage of these materials in a monitored retrievable storage installation (MRS). The regulations also establish requirements, procedures, and criteria for the issuance of Certificates of Compliance approving spent fuel storage cask designs. Certificates of Compliance for storage cask designs are issued in accordance with the requirements of Subpart L of 10CFR Part 72.

This document will only address the requirements and process for the licensing of storage casks used by DOE at DOE sites and the applicable requirements identified in 10 CFR Part 72 that applies to storage casks.

The applicant shall comply with the following guidance or explain deviations as part of the application;

- Each copy of the SARSC and SARSC Completeness Checklist shall be submitted bound in three-ring binders.
- Photocopies must be of sufficient quality that each page of each copy is clear and legible.
- Drawings and diagrams, in particular, must be clear and sharp enough that the necessary level of detail can be discerned.
- Use caution when attempting to make black-and-white photocopies of color originals (such as charts and figures output from finite element analysis software), as valuable information can be lost or obscured. In such cases, it is usually preferable to include the color output in each copy of the SARSC.
- It is highly recommended that an electronic version of the SARSC (e.g., Word or PDF) be submitted along with the hardcopies, as well as a set of full-sized engineering drawings.
- It is also recommended that any important references that are not readily available to the reviewers be submitted along with the SARSCs. Be prepared to submit any additional references promptly upon request.
- Submittals should be sent via express mail so that deliveries can be tracked and that the submittals will arrive in a timely manner. Please do not use standard mail for submittals

SARSC documentation submitted for review should include the following documents, forms, and copies.

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Submittal Form	EM-60 Team Leader	Docket Manager	SARSC Review Team
SARSC (bound hardcopy)	1 copy	1 copy	10 copies
SARSC (electronic version)	1 disk	1 disk	1 disk
SARSC Completeness Checklist	1 copy	1 copy	10 copies
Full-sized engineering drawings	---	1 set	1 set
Ancillary documentation, including references (if any)	---	1 set	1 set

4.2.1 Conditions of Approval

Casks that have been certified for transportation of spent fuel under 10 CFR Part 71 may be approved for the storage of radioactive materials by the DOE. A SARSC showing the cask is suitable for storage of radioactive materials must be provided to the PCP Program Manager.

The information presented in this section is also available from the RAMPAC website.

4.3 Process Flowchart

The storage cask certification process used by the PCP involves a series of actions by both Applicant and Headquarters. Appendix 1 presents this information visually in the form of a color-coded flowchart that includes a number of auxiliary annotations to supplement the basic flow of the process.

The flowchart is also available from the RAMPAC website.

4.4 Storage Cask Certification Process

10 CFR 72, Subpart L provides the requirements for the approval of spent fuel storage casks and shall apply to DOE storage casks, although other requirements of 10 CFR Part 72 for storage facilities may also apply. An application for approval of a DOE storage cask design shall include:

- A safety analysis report describing the proposed cask design and how the cask shall be

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used to store DOE material

- Type and characteristics of radioactive material to be stored
- Maximum allowable enrichment of the fuel prior to irradiation
- Burn-up (i.e., megawatt-days/MTU)
- Minimum acceptable cooling time of the spent fuel prior to storage in the DOE cask
- Maximum heat to be dissipated
- Maximum material loading limit
- Condition of the material (i.e., glass canister, intact assembly or consolidated fuel rods)
- Inerting atmosphere inside cask

DOE storage casks design and fabrication shall be such that:

- Content is maintained in an subcritical condition under credible conditions
- Radiation shielding and confinement systems must meet the requirements in 10 CFR§§ 72.102 and 72.106
- Redundant sealing of confinement systems is provided
- Active cooling systems are not required for heat removal
- Dry and wet spent fuel loading and unloading
- Design and fabrication are compatible for decontamination to extent practical
- Design for minimum twenty (20) years storage and maintenance
- Fabricated casks are free from defects that could significantly reduce confinement effectiveness

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The DOE storage casks and their structures, systems, and components (SSC) important to safety must be designed, fabricated, and tested to quality standards commensurate with the importance to safety of the function performed. The cask and SSC's will be evaluated by appropriate tests or other means acceptable to the PCP Manager, to demonstrate that they will reasonably maintain confinement of radioactive materials under normal, off-normal, and credible accident conditions.

To the extent practical in the design of DOE storage casks, consideration shall be given to:

- Protection against environmental conditions and natural phenomena to include normal operation, maintenance, and testing to withstand postulated accidents
- Effects of natural phenomena such as earthquakes, tornadoes, lightning, hurricanes, floods without impairing intended design functions
- Most severe of the natural phenomena for the storage location and surrounding area
- Appropriate combinations of the effects of normal and accident conditions and the effects of natural phenomena
- Compatibility with removal of the stored material from a DOE site to include transportation and ultimate consolidation/disposition by DOE

It is the responsibility of the storage cask designer to identify the most severe test conditions appropriate for the storage cask design and evaluation.

NUREG-1536, Revision 1A, *Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility*, will be used as the basis for the regulatory review. The SARSC should address the criteria included in this NUREG as appropriate to storage casks.

4.5 CoC Approval

4.6 User Registration

The DOE requires users of storage casks to register in writing with the Assistant Secretary for Environmental Management or the responsible Secretarial Officer/Deputy Administrator, NNSA, prior to using the storage cask certificate. Registration will facilitate dissemination of news or

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other storage cask-specific information to users of the storage casks. The protocol for registration of users of EM-approved radioactive material storage casks was developed from 10 CFR 71.17(c)(3) and 49 CFR 173.471(a).

Each person[1] who intends to store SNF, HLW, or GTCC at DOE sites in a storage cask certified by DOE, shall register in writing with the Assistant Secretary for Environmental Management or the responsible Secretarial Officer/Deputy Administrator, NNSA. Before first use of the DOE-certified storage cask, the user (person) shall submit registration in writing to the PCP manager.

User registration shall include:

- the person's name,
- title,
- registrant status, i.e., certificate holder or user
- affiliation,
- company address,
- telephone and fax numbers,
- e-mail address (if available),
- DOE CERTIFICATE OF COMPLIANCE number and revision, and
- the cask identification number specified in the U.S. DOE CERTIFICATE OF COMPLIANCE for radioactive materials storage casks.

The information presented in this section is also available from the RAMPAC website. There, the registration form can be filled out electronically, but must still be printed, signed and mailed as directed above.

6.4 Guidance for DOE Use of NRC Certificates

DOE and DOE contractors may utilize an NRC storage cask Certificate only if DOE is either the "certificate holder" or a "registered user" of the NRC Certificate. The RAMPAC website[2] maintains a current listing of NRC Certificates with either of these relationships.

DOE is a Certificate Holder: The prospective user must contact the DOE and/or the DOE contractor to determine availability of storage cask unit(s) fabricated in compliance with the

[1] Definitions of "person" and "offeror" provided in 49 CRF 171.8.

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specific Certificate and to obtain the required documents to utilize the NRC Certificate.

DOE is a Registered User: The prospective user must contact the certificate holder to obtain storage cask unit(s) and documentation necessary to utilize NRC Certificate.

DOE is neither Certificate Holder nor Registered User: The prospective user must submit a request to EM-45 via his respective DOE field office, asking the NRC to add the DOE as a registered user. EM-45 will forward the request to the NRC, will notify the DOE field office when DOE has been registered as a user, and will update the RAMPAC website accordingly.

The DOE requires DOE and DOE contractors who plan to utilize DOE Certificates to register with the DOE prior to first use, see Section 4.6. EM-45 recommends those who intend to utilize NRC Certificates register similarly with EM-45.

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6.5 Guidance for DOE Use of DOT-IAEA Certificates

DOT issues USA IAEA Certificates for shipments from the United States to other countries based on "certified" USA packagings and for shipments to the United States based on Certificates from other countries. USA-"Certified" packagings can be based on the following.

[2] Select "Points of Contact" from the "Docket Status and Statistics" page.

- NRC Certificates,
- DOE Certificates,
- Special Form Certificates from DOT, and
- DOT Specification packagings described in 49 CFR Parts 100-185.

All hazardous material shipments made by DOE Contractors are officially DOE shipments. That is, DOE directs the shipments. DOT requires DOE contractors to register with DOT if they intend to make hazardous material shipments in commerce. DOE contractors may ship under a DOT-IAEA Certificate only if DOE is listed "certificate holder" or a "registered user." However, if a DOE Contractor intends to ship under a DOT-IAEA Certificate, the contractor must register directly with DOT as a user.

DOE is a Registered User: The prospective user must contact the certificate holder to obtain packaging unit(s) and documentation necessary to utilize DOT Certificate.

DOE is not a Registered User: The prospective user must submit a request to EM-60 via his respective DOE field office, asking the DOT to add the DOE as a registered user. EM-60 will forward the request to DOT, will notify the DOE field office when DOE has been registered as a user, and will update the RAMPAC website accordingly.

DOT does not require contractors who plan to utilize a DOT-IAEA Certificate to register with EM-60 prior to first use. However, EM-60 recommends those who intend to utilize DOT Certificates to provide a copy of the "registered user" application to the respective DOE field office.

7.0 Planning Assumptions

PCP is based on the assumption timely, effective planning and implementation of packaging is essential to the success of EM's accelerated and safe cleanup objectives.

The PCP program is based on the assumption of integrated support from other EM programs for coordinated activities. PCP relies on the continued support of numerous research, manufacturing, and testing facilities throughout the complex.

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8.0 Risks

Completion of PCP goals as planned requires a number of factors to operate in concert as the work proceeds. Deviation from any one of these factors may cause delays in schedules, reductions in scope, or increased technical risks and uncertainties. Details on specific risks are contained in PCP Risk Management Plan, but these risks can also be grouped into three general categories as noted below.

Category	Risk Event	Impacts/Consequences
Funding	Funding levels are lower than requested and unanticipated packaging requests.	▪ Increase the technical risk or uncertainty ▪ Reduce the scope ▪ Delay the schedule and/or increase risk of missing deliverables ▪ Increase costs
Facilities	Critical facilities are not available due to environmental-safety-and-health (ES&H) concerns, competition with other programs, weather status, terrorist-alert status, etc.	
Personnel	Critical personnel are not available due to reassignment, attrition, illness, etc.	

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APPENDIX 1
PACKAGE CERTIFICATION PROCESS FLOWCHART

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APPENDIX 2
SARSC WRITING TEAM
QUALIFICATIONS, EDUCATION AND TRAINING GUIDANCE

Team Member	Qualifications	Education	Training
SWT Manager	Prior participation as a SWT member that received certification from DOE or NRC; 10 years experience in engineering design, testing, and/or analysis that includes 2 years in RAM packaging; 3+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity with: • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Physical Science, Engineering, or Mathematics	LLNL SARSC Reviewer course; ANL QA for Packaging course; SRNL Management of SARSC Preparation course
Chapter 1, General Information	7 years experience (or a current P.E. license and 4 years experience) in engineering design, testing, and/or analysis that includes 4 years in RAM packaging; 2+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity with: • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Physical Science, Engineering, or Mathematics	LLNL SARSC Reviewer course; ANL QA for Packaging course

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Team Member	Qualifications	Education	Training
Chapter 2, Structural Evaluation	7 years experience (or a current P.E. license and 4 years experience) in engineering design, testing, and/or analysis that includes 1 year in RAM packaging; 2+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity with: • Structural analysis computer codes • ASME B&PV Code • AWS structural welding codes • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Civil, Structural, or Mechanical Engineering	LLNL SARSC Reviewer course; ANL QA for Packaging course; ANL ASME Code for Packaging course; Courses on FEM codes, as appropriate
Chapter 3, Thermal Evaluation	7 years experience (or a current P.E. license and 4 years experience) in engineering design, testing, and/or analysis that includes 1 year in RAM packaging; 2+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity with: • Thermal analysis computer codes • ASME B&PV Code • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Mechanical or Nuclear Engineering	LLNL SARSC Reviewer course; ANL QA for Packaging course; ANL ASME Code for Packaging course; Courses on FEM codes as appropriate

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Team Member	Qualifications	Education	Training
Chapter 4, Containment	7 years experience (or a current P.E. license and 4 years experience) in operational aspects of DOE nuclear facilities and/or use of operating procedures for transportation, storage, and disposal of RAM; 2+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity (3+ years experience) with: • ASME B&PV Code • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Engineering or Physical Science	LLNL SARSC Reviewer course; ANL QA for Packaging course; ANL ASME Code for Packaging course
Chapter 5, Shielding Evaluation	7 years experience (or a current P.E. license and 4 years experience) in operational aspects of DOE nuclear facilities and/or use of operating procedures for transportation, storage, and disposal of RAM; 2+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity with: • Shielding analysis computer codes • ASME B&PV Code • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Nuclear Engineering or Health Physics	LLNL SARSC Reviewer course; ANL QA for Packaging course; ANL ASME Code for Packaging course; Courses on Monte Carlo codes such as SCALE and/or MCNP as appropriate

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Team Member	Qualifications	Education	Training
Chapter 6, Criticality Evaluation	7 years experience (or a current P.E. license and 4 years experience) in operational aspects of DOE nuclear facilities and/or use of operating procedures for transportation, storage, and disposal of RAM; 2+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity with: • Criticality analysis computer codes • ASME B&PV Code • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Nuclear Engineering	LLNL SARSC Reviewer course; ANL QA for Packaging course; ANL ASME Code for Packaging course; Courses on Monte Carlo codes such as SCALE and/or MCNP as appropriate
Chapter 7, Operating Procedures	7 years experience (or a current P.E. license and 4 years experience) in operational aspects of DOE nuclear facilities and/or use of operating procedures for transportation, storage, and disposal of RAM; 2+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity (3+ years experience) with: • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Physical Science, Engineering, or Mathematics	LLNL SARSC Reviewer course; ANL QA for Packaging course

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Team Member	Qualifications	Education	Training
Chapter 8, Acceptance Tests and Maintenance Program	7 years experience (or a current P.E. license and 4 years experience) in operational aspects of DOE nuclear facilities and/or use of operating procedures for transportation, storage, and disposal of RAM; 2+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity (3+ years experience) with: • DOT hazmat regulations • 10 CFR 71 • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Physical Science, Engineering, or Mathematics	LLNL SARSC Reviewer course; ANL QA for Packaging course
Chapter 9, Quality Assurance	7 years experience (or a current P.E. license and 4 years experience) as a quality assurance specialist for a DOE or NRC site or facility; 2+ years experience generating technical documentation that includes 1 year in writing SARSCs; Working familiarity (3+ years experience) with: • 10 CFR 50 Appendix B • 10 CFR 830.122 • DOE Order 414.1A • ASME NQA-1 • DOE packaging Orders • NRC packaging Reg Guides • DOE Packaging Review Guide	B.S. or equivalent in Physical Science, Engineering, or Mathematics	LLNL SARSC Reviewer course; ANL QA for Packaging course

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APPENDIX 3
LIST OF ABBREVIATIONS AND ACRONYMS

ANL	Argonne National Laboratory
CCB	Change Control Board
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EM	(DOE Office of) Environmental Management
FY	Fiscal Year
HQ	(DOE) Headquarters
LLNL	Lawrence Livermore National Laboratory
NE	(DOE Office of) Nuclear Energy
NNSA	National Nuclear Security Administration
NRC	U.S. Nuclear Regulatory Commission
OMB	Office of Management and Budget
ORNL	Oak Ridge National Laboratory
PCP	Package Certification Program
RAM	Radioactive material
SARSC	Safety Analysis Report for Packaging
SRNL	Savannah River National Laboratory
SRT	SARSC Review Team
SWT	SARSC Writing Team

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6. Training and Guidance

The PCP assigns the responsibilities for preparing and delivering training courses that meet EM's needs for packaging-relevant classroom instruction to the EM laboratories.

6.1 Preparation of Required Documents

SRNL presents *Management of SARSC Preparation*. The course provides guidance for the person who has the task of building a SARSC for submittal to DOE's regulatory review process. The three-day course guides the SARSC manager through regulatory, managerial and technical issues and includes applicable case histories.

LLNL presents *Methods for Reviewing Safety Analysis Reports for Packages and Performing Confirmatory Analysis*. The focus of the eight-day training is on development of skills in reviewing Safety Analysis Reports for Packaging (SARSCs) and in performing confirmatory analyses.

6.2 Development of Quality Assurance Programs

ANL presents *Quality Assurance for Radioactive Material Packaging*. The course provides both QA training and practical experience for DOE personnel and contractors who are required to develop and implement a QA plan or prepare the QA chapter of a Safety Analysis Report for Packaging (SARSC). The three-day course begins with instructions concerning basic QA principles and concepts and quickly advances to packaging specific information.

6.3 Application of ASME Codes

ANL presents *Application of the ASME Code to Radioactive Material Packagings*. The course provides guidance for application of the ASME Boiler & Pressure Vessel (B&PV) Code to high-level radioactive materials or fissile material packagings for transportation or storage of radioactive materials. The three-day course facilitates design, fabrication, examination and testing of packagings that meets all applicable ASME Code requirements and all governing federal requirements and regulations.

4.3 Guidelines for SARSC Writing Team Qualifications, Education and Training

The SARSC Writing Team (SWT) should be qualified for the task of writing a SARSC. Every SWT member should have at least 7 years experience (or a current P.E. license and 4 years

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experience) in applicable engineering design, testing, analysis, operations or QA that includes 1 year in RAM packaging, plus 2+ years experience generating technical documentation that includes 1 year in writing SARSCs. Every SWT member should also have working familiarity with the DOT hazardous materials regulations, 10 CFR 71, DOE packaging Orders, NRC packaging Regulatory Guides, and the DOE Packaging Review Guide. However, specific SWT members should have additional or higher qualifications. Appendix 2 lists the entire set of guidelines in table form organized by discipline.

EM-60 retains the right to approve applicants with less than full qualification based upon review of the credentials, experience, or alternate qualifications of individual team members and/or the SWT as a whole. The information presented in this section is also available from the RAMPAC website.

4.4 SARSC-Completeness Checklist

The SARSC-Completeness Checklist is a tool for assisting both Applicants and Reviewers in determining whether a SARSC is complete and contains all required information. Instructions for the Applicant are included within the Checklist. The Checklist is available from the RAMPAC website in two electronic forms.

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