marketing order. Small agricultural producers have been defined by the Small Business Administration (13 CFR 121.201) as those having annual receipts less than $500,000, and small agricultural service firms are defined as those whose annual receipts are less than $5,000,000.

Based on the Georgia Agricultural Statistical Service and committee data, the average price for fresh Vidalia Onions during the 1998–99 season was $15.45 per 50-pound bag, or equivalent and shipments totaled 3,617,017 bags. Many Vidalia onion handlers ship other vegetable products which are not included in the committee data, but would contribute further to handler receipts.

Using the average price, about 97.4 percent of Vidalia Onion handlers could be considered small businesses under the SBA definition. The majority of Vidalia Onion producers and handlers may be classified as small entities.

This rule continues in effect § 955.121 to change the two-year term of office to January 1–December 31 from September 16–September 15 to keep the term of office on a fiscal year basis. It also continues in effect § 955.122 to modify the deadlines when nominations are to be held and reports of the nominations are to be made to the Secretary. The changed deadlines provide the same amount of time for conducting and submitting nominations for producer members and alternates and for the public member and alternate as were provided previously. For producer member and alternate members, the time for conducting nominations was changed from August 1 to October 1, and the time for submitting the nominations to Secretary was changed from August 15 to October 15. The time for submitting the public member and alternate public member nominations was changed from November 1 to February 15 for a new term of office. Also, for the eight Committee members and alternates whose terms of office were scheduled to end on September 15, 1999, their terms of office continued through December 31, 1999, or until qualified successors were selected. These positions on the Committee were filled by the Secretary on February 24, 2000.

The changes in the term of office and the nomination deadlines should not impose any additional costs on large or small firms in the Vidalia onion industry. The changes merely bring the term of office and the nomination deadlines into conformity with the recent change in the fiscal period which was changed to a calendar year basis (January 1–December 31) from September 16–September 15.

The Committee discussed the alternative of leaving the term of office and nomination deadlines as they were. However, the Committee believed that the term of office and nomination deadlines should continue to be based on the fiscal period, which now is established on a calendar year basis.

This rule will not impose any additional reporting or recordkeeping requirements on either small or large Vidalia onion handlers. As with all Federal marketing order programs, reports and forms are periodically reviewed to reduce information requirements and duplication by industry and public sectors. In addition, as noted in the initial regulatory flexibility analysis, the Department has not identified any relevant Federal rules that duplicate, overlap or conflict with this rule.

Further, the Committee's meeting was widely publicized throughout the Vidalia onion industry and all interested persons were invited to attend the meeting and participate in Committee deliberations. Like all Committee meetings, the September 30, 1999, meeting was a public meeting and all entities, both large and small, were able to express their views on this issue.

An interim final rule concerning this action was published in the **Federal Register** on December 27, 1999. Copies of the rule were mailed by the Committee's staff to all Committee members and Vidalia onion handlers. In addition, the rule was made available through the Internet by the Office of the Federal Register. That rule provided for a 30-day comment period which ended January 26, 2000. No comments were received.

A small business guide on complying with fruit, vegetable, and specialty crop marketing agreements and orders may be viewed at the following website: http://www.ams.usda.gov/fv/moab.html. Any questions about the compliance guide should be sent to Jay Guerber at the previously mentioned address in the **FOR FURTHER INFORMATION CONTACT** section.

After consideration of all relevant material presented, including the Committee's recommendation, and other information, it is found that finalizing the interim final rule, without change, as published in the **Federal Register** (64 FR 72267, December 27, 1999) will tend to effectuate the declared policy of the Act.

List of Subjects in 7 CFR Part 955

Marketing agreements, Onions, Reporting and recordkeeping requirements.

PART 955—VIDALIA ONIONS GROWN IN GEORGIA

Accordingly, the interim final rule amending 7 CFR part 955 which was published at 64 FR 72267, December 27, 1999, is adopted as a final rule without change.

Dated: March 6, 2000.

Robert C. Keeney,

Deputy Administrator, Fruit and Vegetable Programs.

[FR Doc. 00–5771 Filed 3–8–00; 8:45 am]

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NUCLEAR REGULATORY COMMISSION

10 CFR Part 72

RIN 3150–AG 37

List of Approved Spent Fuel Storage Casks: NAC–MPC Addition

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is amending its regulations to add the NAC International Multi-Purpose Canister cask system to the list of approved spent fuel storage casks. This amendment allows the holders of power reactor operating licenses to store spent fuel in this approved cask system under a general license.

EFFECTIVE DATE: This final rule is effective on April 10, 2000.

FOR FURTHER INFORMATION CONTACT: Merri Horn, telephone (301) 415–8126, e-mail mlh1@nrc.gov of the Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001.

SUPPLEMENTARY INFORMATION:

Background

Section 218(a) of the Nuclear Waste Policy Act of 1982, as amended (NWPA), requires that ''[t]he Secretary [of Energy] shall establish a demonstration program, in cooperation with the private sector, for the dry storage of spent nuclear fuel at civilian nuclear reactor power sites, with the objective of establishing one or more technologies that the [Nuclear Regulatory] Commission may, by rule, approve for use at the sites of civilian nuclear power reactors without, to the maximum extent practicable, the need for additional site-specific approvals by the Commission.'' Section 133 of the NWPA states, in part, ''[t]he Commission shall, by rule, establish procedures for the licensing of any technology approved by the Commission under Section 218(a) for use at the site of any civilian nuclear power reactor.''

To implement this mandate, the NRC approved dry storage of spent nuclear fuel in NRC-approved casks under a general license, publishing a final rule in 10 CFR Part 72 entitled, ''General License for Storage of Spent Fuel at Power Reactor Sites'' (55 FR 29181; July 18, 1990). This rule also established a new Subpart L within 10 CFR Part 72 entitled, ''Approval of Spent Fuel Storage Casks,'' containing procedures and criteria for obtaining NRC approval of dry storage cask designs.

Discussion

This rule will add the NAC International Multi-Purpose Canister cask system to the list of NRC-approved casks for spent fuel storage in 10 CFR 72.214. Following the procedures specified in 10 CFR 72.230 of Subpart L, NAC International (NAC) submitted an application for NRC approval with the Safety Analysis Report (SAR) entitled ''Safety Analysis Report for the NAC Multi-Purpose Canister System (NAC–MPC).'' The NRC evaluated the NAC submittal and issued a preliminary Safety Evaluation Report (SER) and a proposed Certificate of Compliance (CoC) for the NAC Multi-Purpose Canister (NAC–MPC) cask system. The NRC published a proposed rule in the **Federal Register** (64 FR 45918; August 23, 1999) to add the NAC–MPC cask system to the listing in 10 CFR 72.214. The comment period ended on November 8, 1999. Five comment letters were received on the proposed rule.

Based on NRC review and analysis of public comments, the NRC staff has modified, as appropriate, its proposed CoC and the Technical Specifications (TSs) for the NAC–MPC cask system. The NRC staff has also updated the CoC and removed the bases section from the TSs attached to the CoC to ensure consistency with NRC's format and content. The NRC staff has also modified its SER in response to some of the comments.

The title of the SAR has been revised to delete the revision number so that in the final rule the title of the SAR is ''Final Safety Analysis Report for the NAC Multi-Purpose Canister (NAC–MPC) System.'' This revision conforms the title to the requirements of new 10 CFR 72.248, recently approved by the Commission. The NRC staff has also modified the rule language by changing the word ''certification'' to ''certificate'' to clarify that it is the Certificate that expires.

The proposed CoC has been revised to clarify the requirements for making changes to the CoC by specifying that the CoC holder must submit an application for an amendment to the certificate if a change to the CoC, including its appendices, is desired. This revision conforms the change process to that specified in 10 CFR 72.48, as recently approved by the Commission. In addition, other minor, nontechnical changes have been made to the CoC 1025 to ensure consistency with NRC's new standard format and content for CoCs.

The NRC finds that the NAC–MPC cask system, as designed and when fabricated and used in accordance with the conditions specified in its CoC, meets the requirements of 10 CFR Part 72, Subpart L. Thus, use of the NAC–MPC cask system, as approved by the NRC, will provide adequate protection of public health and safety and the environment. With this final rule, the NRC is approving the use of the NAC–MPC cask system under the general license in 10 CFR Part 72, Subpart K, by holders of power reactor operating licenses under 10 CFR Part 50. Simultaneously, the NRC is issuing a final SER and CoC that will be effective on April 10, 2000. Single copies of the CoC and SER are available for public inspection and/or copying for a fee at the NRC Public Document Room, 2120 L Street, NW. (Lower Level), Washington, DC.

Summary of Public Comments on the Proposed Rule

The NRC received five comment letters on the proposed rule. The commenters included two utilities, a public interest group, and two letters from one member of the public. Copies of the public comments are available for review in the NRC Public Document Room, 2120 L Street, NW (Lower Level), Washington, DC 20003–1527.

Comments on the NAC–MPC Cask System

The comments and responses have been grouped into nine subject areas: general, radiation protection, accident analysis, welds, design, thermal, structural, technical specifications, and miscellaneous issues. Several of the commenters provided specific comments on the draft CoC, the NRC staff's preliminary SER, and the TSs. To the extent possible, all of the comments on a particular subject are grouped together. The listing of the NAC–MPC cask system within 10 CFR 72.214, ''List of approved spent fuel storage casks,'' has not been changed as a result of the public comments. A review of the comments and the NRC staff's responses follow:

A. General

Comment A.1: One commenter stated that each cask review should be site specific with an Environmental Impact Statement (EIS) and a public hearing. The commenter further stated that the NRC should not be certifying numerous generic cask designs because the waste system in the country lacks standardization and integration.

Response: These comments are beyond the scope of this rulemaking that is focused solely on whether to add a particular cask design, the NAC–MPC cask system, to the list of approved casks. Pursuant to the general license, each licensee must determine whether or not the reactor site parameters are encompassed by the cask design bases considered in the cask SAR and SER. Further, each general licensee must document this determination in accordance with 10 CFR 72.212. The rulemaking process, used by the NRC for generic cask approval, is the regulatory vehicle that provides opportunity for public input.

Comment A.2: One Commenter stated that tiering on past EISs for dry storage is invalid for modern dry cask storage.

Response: The NRC disagrees with the comment. The environmental assessment (EA) and finding of no significant impact (FONSI) prepared as required by 10 CFR Part 51 conform to National Environmental Policy Act (NEPA) procedural requirements. Tiering on past EISs and EAs is a standard process under NEPA. As stated in the Council on Environmental Quality's 40 Frequently Asked Questions, the tiering process makes each EIS/EA of greater use and meaning to the public as the plan or program develops without duplication of the analysis prepared for the previous impact statement.

Comment A.3: One commenter stated that the cask should be built and tested before use at reactors, including the loading and unloading procedures.

Response: The NRC disagrees with the comment. The NAC–MPC storage cask system design has been reviewed by the NRC. The basis of the safety review and findings are identified in the SER and CoC. Testing is normally required when the analytic methods have not been validated or assured to be appropriate and/or conservative. In place of testing, the NRC finds acceptable analytic conclusions that are based on sound engineering methods and practices. The NRC staff has reviewed the analyses performed by NAC and found them acceptable.

Comment A.4: One commenter objected to the use of the term ''transportable'' in the SER, SAR and CoC and recommended that the term be removed because the certification is only for storage. In addition the cask cannot be considered a multipurpose cask until both storage and transportation are certified. The commenter further stated that the NRC should review a cask for storage and transport, and issue both certificates at the same time so any changes necessitated in the design can be accounted for in the initial approval. The commenter expressed concern that utilities may end up with loaded casks that cannot be transported.

Response: The NRC disagrees with the comment. The use of the term ''transportable'' in the SER, SAR, or CoC is descriptive of the intended functionality of the canister. The use of such terminology in a dry storage cask application or an NRC SER/CoC does not represent a certification under 10 CFR Part 71 for the transport of radioactive materials. Further, separate certifications are required for approval of a cask design (or individual components such as a canister) under the provisions of use for 10 CFR Parts 71 and 72. There is no regulatory requirement that the certification be simultaneous. The NRC staff's review schedule depends on applicant submittals and workload considerations. The NRC staff notes that the NRC, on March 25, 1999, approved the NAC–MPC's transportable storage canister and its contents for transport in the NAC–STC cask design (Docket No. 71–9235).

Comment A.5: One commenter stated that the only multi-purpose casks acceptable for the high level repository would be a design that the Office of Civilian Radioactive Waste Management develops and therefore, the cask should not be called a multi-purpose.

Response: The NRC disagrees with the comment. The name or model number given to the cask design is developed by the applicant. The CoC for the NAC–MPC is intended for the interim storage of spent fuel. In the case of the NAC–MPC, the same contents within the Transportable Storage Canister have been approved for transportation. The use of the NAC–MPC cask design for disposal at a high-level waste repository is beyond the scope of this rule. The U.S. Department of Energy (DOE) has not yet made final decisions regarding design or deployment for the cask design to be used in the high-level waste repository.

Comment A.6: One commenter asked TSC to be defined.

Response: TSC stands for Transportable Storage Canister.

Comment A.7: One commenter stated that taking the cask to the pad should not be referred to as transport.

Response: The term ''TRANSPORT OPERATIONS'' and its associated use is defined in the DEFINITIONS section of the TSs and refers to the on-site movement of a loaded Vertical Concrete Cask (VCC) to the pad. The term is used consistently throughout the TSs and is pertinent only to activities carried out in accordance with the 10 CFR Part 72 CoC. The term is not associated with the offsite transport of spent fuel in accordance with 10 CFR Part 71.

Comment A.8: One commenter stated that dates should be added to some of the references for which the date is missing.

Response: The NRC agrees with the comment. Dates have been added, as appropriate, to the list of references in the SER.

Comment A.9: One commenter asked if the lids, containments, and VCCs were interchangeable, the commenter felt that they should be interchangeable and built to specific criteria.

Response: The NRC agrees with the comment. The specifications to which the storage cask design components are built, including the canister, lids, and vertical concrete casks, are listed in the license drawings contained in Section 1.5 of the SAR. Because all of the components for each cask are built to the same specifications, they are considered interchangeable to that extent.

Comment A.10: One commenter objected to the use of the term ''Final'' in the title of the SAR because changes will be made. The commenter also objected to the use of ''or'' instead of ''and'' in Condition 2 of the CoC because the TSs are part of the CoC.

Response: The use of the term ''Final'' in the title of the SAR does not imply that changes can not be made. It is indicative that the NRC has approved the design and is consistent with the added regulatory requirement in 10 CFR 72.248 (effective February 1, 2000) to submit a ''Final'' SAR. The use of the term ''or'' in Condition 2 is appropriate because it is possible to change the CoC without necessitating a change to the technical specifications.

Comment A.11: One commenter stated that the TSs should be easy to understand (simple directions) and that there should be clear definite criteria.

Response: The NRC agrees that the TSs should be understandable to a knowledgeable user such as licensee staff and should contain clear, definite criteria. An NRC goal in the development of the NAC–MPC TSs was to make them easy to understand and to contain clear, definite criteria.

Comment A.12: One commenter asked what kind of communication devices are mandatory for workers and how the devices were checked (during movement of casks on the pads and in other high noise and low visibility activities) because the workers need to be in constant communication.

Response: Communication devices utilized during the performance of cask operations are beyond the scope of this rule that certifies the cask design. Effective communications are an aspect of site-specific operating procedures to be developed by the cask users.

Comment A.13: One commenter expressed concern that the copy of the SER they received was missing some pages. The commenter was concerned that the SER was not complete when the CoC was proposed for rulemaking.

Response: The SER and CoC were complete at the time of the proposed rulemaking. The copy in the PDR is complete. During the copying process of copies to be dispatched for comment, apparently some pages were skipped by the copy machine. Subsequently, a complete copy was provided to the commenter. The NRC apologizes for any inconvenience that was caused by the missing pages.

Comment A.14: One commenter stated that references from the 1970s should not be used for modern dry casks. Specifically, the commenter referred to a 1974 reference on tornadoes and a 1978 ALARA reference.

Response: The NRC disagrees with the comment. The references cited are considered appropriate for the approval of dry cask storage system designs and were also utilized in the recent development of the standard review plan for dry cask storage systems. The NRC staff is not aware of technical inaccuracies in these documents that would render their use inappropriate. The commenter did not identify any specific technical inaccuracies.

B. Radiation Protection

Comment B.1: One commenter questioned the use of a maximum value for contamination of the outside surface of the canister. The commenter felt that the contamination should be at a minimum to protect worker and public exposure. The commenter also questioned the use of a small accessible area of the canister as being representative of other areas in checking for contamination and how the interior surface contamination of the transfer cask was verified.

Response: Technical Specification 3.2.2 specifies the maximum permissible levels of removable surface contamination on the exterior surface of the canister. These limits are taken from guidance in NRC IE Circular 81–07. Experience has shown that these limits are low enough to prevent the spread of contamination to clean areas and are consistent with accepted ALARA practices.

By circulating demineralized water through the annulus between the canister and transfer cask to keep the pool water out of this region during loading operations in the spent fuel pool, the chance of contaminating the canister is reduced. The highest levels of canister contamination are expected to be on the accessible surfaces exposed to spent fuel pool water. By ensuring that this area meets the Technical Specification limit for contamination, it is expected that the exterior surface of the canister will also meet the same limits. The cask user is also required to verify the interior surface of the transfer cask is not contaminated. The interior walls of the transfer cask are made of the same material as the canister and will be exposed to the same water environment as the canister during loading in the fuel pool. Therefore, if the transfer cask walls are not contaminated as determined by a survey after VCC loading, then the exterior walls of the canister should also be free of contamination.

Comment B.2: One commenter asked about the surface contamination levels of a transfer cask after frequent use. The commenter also asked where the transfer cask is stored when it is not in use.

Response: After each use of the transfer cask, the surface contamination levels must be verified to be less than or equal to the limit specified in Technical Specification 3.2.2. Additionally, in accordance with 10 CFR Part 20, the end-user of the cask is required to have a radiation protection program in place that is commensurate with the activities of the facility. This program is designed to ensure levels are maintained ALARA.

The question on where the transfer cask is stored when not in use is beyond the scope of this rule. The transfer cask must be handled and stored in accordance with the cask user's radiation program procedures.

Comment B.3: One commenter was concerned about the dose to a worker checking the top outlets or welding near the inlets and outlets or conducting other maintenance or surveillance activities (including for the casks in the future) and asked if there was gap streaming at the top end. The commenter further questioned where the dosimeters for workers were located (on the feet, shoulder height, etc) to make sure the readings were accurate. The commenter further stated that shielding must be confirmed in areas of high dose.

Response: The occupational doses from maintenance and surveillance from MPC casks loaded with design basis fuel is described in Chapter 10 of the SAR. The calculated occupational doses have been reviewed and have been found to be acceptable. Additionally, if the dose rates measured on the loaded concrete cask are equal to or less than the limits specified in Technical Specification 3.2.1, then there is adequate assurance that the shielding is in place.

The specifics on doses received by workers performing maintenance and surveillance will be managed under the cask user's radiation protection program required by 10 CFR Part 20. This program will include radiation surveys of the casks so maintenance workers will know where the areas of high radiation occur, instruction to workers on how long they can stay in the area of the casks to perform maintenance and surveillance, and instructions for proper dosimeter placement.

Comment B.4: One commenter questioned why a Kansas University Skyshine experiment was used as a benchmark and whether this had been rechecked by the NRC. The commenter further questioned why a skyshine input manual was considered proprietary.

Response: The NRC finds conclusions based on sound engineering methods and practices to be acceptable. The previous version of the code, Skyshine II, was sponsored by the NRC. The current version, Skyshine III, extended the program's capabilities and was sponsored by Los Alamos National Laboratories. The changes to NAC's PC version of the Skyshine code were benchmarked against the results of experiments conducted by Kansas State University (KSU). These benchmark computations have been published in technical journals, textbooks on radiation shielding, and in a Sandia National Laboratory report. The KSU Skyshine experiment results are accepted industry wide for the methodology and were conducted by experts in the field of radiation shielding. Therefore, the NRC finds the Skyshine code to be acceptable.

By a letter dated October 8, 1998, NAC requested that the skyshine manual and calculations be considered as proprietary under the provisions of 10 CFR 2.790. By a letter dated May 3, 1999, NRC informed NAC that their request to keep the skyshine manual and calculations proprietary was approved for the following reasons:

a. The information has been held in confidence and is the result of design calculations and computer code development performed by NAC. The information is customarily held in confidence by NAC based on the significant commercial investment expended in its development;

b. The information is not available in public sources, and NAC is transmitting it to the Nuclear Regulatory Commission (NRC) in confidence; and

c. The public disclosure of the information would cause substantial harm to the competitive position of NAC. Competitors seeking to develop similar computer code information and calculations would have to expend similar amounts of time, engineering labor, and money in its development.

Comment B.5: One Commenter stated that the dose consequences from a failure of all fuel rods with a subsequent canister breach, including the source term, should be evaluated because the canister can not be assured to be leaktight.

Response: The NRC disagrees with the comment. Interim Staff Guidance (ISG) No. 3, ''Post Accident Recovery and Compliance with 10 CFR 72.122(l)'', specifies that only credible accidents, and the associated consequences, be evaluated against the requirements of 10 CFR Part 72. The hypothetical accident of a ground level breach, with 100% fuel rod failure, is considered to be a non-mechanistic, non-credible accident. Therefore, the applicant is not required to analyze the consequence of this type of accident. As indicated in SAR Section 7.1, the confinement boundary is completely welded and inspected in accordance with both the ASME Code and ISG No. 4, ''Cask Closure Weld Inspections,'' and is leak tested to American National Standards Institute leaktight standards. Further, the analyses presented in the SAR demonstrated that the stresses, temperatures, and pressures of the TSC are within the design basis limits under the accident conditions identified by the applicant and that the confinement boundary of the TSC remains intact from all credible accidents. The NRC concurs with the evaluation in the SAR and believes that the design of the confinement boundary, which includes the inspection of welds, is adequately rigorous and meets the applicable regulations.

Comment B.6: One commenter questioned how the effluent from flushing the radioactive gases with nitrogen would be managed, how it would impact workers and the public from ALARA considerations, and how time factored in for the release.

Response: The canister to be unloaded will be flushed with nitrogen gas to remove any accumulated radioactive gases prior to initiating fuel cooldown. The amount of radioactive gases displaced by the nitrogen gas is first assessed by sampling to determine the appropriate radiological controls. Any gaseous effluent released from the cask would be processed through HEPA filters and any additional filtration systems a facility may have in order to filter the air from a fuel handling building or reactor building. All effluents released from this building system would have to be in compliance with the 10 CFR Part 50 license.

C. Accident Analysis

Comment C.1: One commenter questioned the adequacy of administrative controls to exclude explosions (such as a truck bomb) in the vicinity of an Independent Spent Fuel Storage Installation (ISFSI). The commenter recommended that the evaluation of a sabotage event for an ISFSI be updated.

Response: These comments are outside the scope of this rulemaking. Spent fuel in the ISFSI is required to be protected against radiological sabotage under the provisions of 10 CFR 72.212(b)(5). Each utility licensed to have an ISFSI at its reactor site is required to develop physical protection plans and install a physical protection system that provides high assurance against unauthorized activities that could constitute an unreasonable risk to the public health and safety. The physical protection systems at an ISFSI and its associated reactor are similar in design to ensure the detection and assessment of unauthorized activities. Response to intrusion alarms is required. Each ISFSI is periodically inspected by NRC. Also, the licensee conducts periodic patrols and surveillances to ensure that security systems are operating within their design limits. The NRC believes that the inherent nature of the spent fuel storage cask also provides significant protection against malevolent acts.

Comment C.2: One commenter recommended that a multi-missile (natural or man-made) scenario be considered in the accident analysis.

Response: The NRC disagrees with the comment. The NRC staff, in Section 3.4.2 of the SER, agreed with the SAR conclusion that the design basis tornado-driven missiles are not capable of overturning the cask or penetrating the VCC. Multiple tornado-driven high-energy or penetrating missiles impinging simultaneously at the same cask location is beyond the design bases and is not considered to be credible.

NRC regulations in 10 CFR Part 72 establish physical protection requirements for an ISFSI located within the owner-controlled area of a licensed power reactor site. Spent fuel in the ISFSI is required to be protected against radiological sabotage using provisions and requirements as specified in 10 CFR 72.212(b)(5). Further, specific performance criteria are specified in 10 CFR Part 73. Each utility licensed to have an ISFSI at its reactor site is required to develop physical protection plans and install systems that provide high assurance against unauthorized activities that could constitute an unreasonable risk to the public health and safety.

Comment C.3: One commenter questioned the bounding fire analysis (8 minute, 638°F fire) and recommended that a fire initiated from an airplane crash or a different type of vehicle be used. The commenter further questioned the location of the fire at the base because flaming debris could land on top of the cask. The commenter also questioned whether lightning was considered to start a fire.

Response: The basis for the 8-minute fire is associated with the time it would take to burn 50 gallons of fuel, presumably carried by the transporter. Other modes of transport causing the fire (such as airplanes, trains, delivery trucks) are not considered plausible. However, before using the NAC–MPC cask, the general licensee must evaluate the site to determine whether or not the chosen site parameters are enveloped by the design bases of the approved cask as required by 10 CFR 72.212(b)(3). Included in this evaluation is the verification that the cask handling equipment used to move the VCC to the pad is limited to 50 gallons of fuel (as detailed in Technical Specification 4.4.5-Site Specific Parameters and Analyses). The fire is assumed to burn at 1475°F and is assumed to be at ground level since that produces the worse case scenario of fire/heated air entering the inlet vents of the VCC and coming into direct contact with the outside of the canister. Exposure of the VCC to fire of this duration would have little effect on the canister or its contents. Lightning causing a fire in the vicinity of the VCC is not considered plausible because of the absence of combustible material.

Comment C.4: One commenter questioned why a seismic event or a landside that buries a cask is not considered credible.

Response: Burying a cask due to seismic event, landside, or tornado is considered a very unlikely event. Considering the unlikeliness of the event and the capability of cask components and contents to be within their thermal limits after blockage of the air passages for 45 hours, adverse consequences from cask burial are not considered to be credible. For example, casks are designed to withstand tipover loadings, yet tipover is designed not to happen for a certain size earthquake. Further, casks are analyzed to be within their thermal limits for up to 45 hours that would allow ample time for restoring the cask's cooling system to an operable status.

Comment C.5: One commenter questioned whether the pad had been evaluated for an earthquake because the pad could crack and cause the cask to tipover. The commenter further questioned what happens to the pad footer and steel reinforcement during an earthquake.

Response: The storage pad, which is beyond the scope of this cask design rulemaking, has not been evaluated for natural phenomena, including earthquakes. In accordance with 10 CFR 72.212, the cask operators are required to perform written evaluations to ensure that storage pads have been designed to adequately support the stored casks. The earthquake motions defined for the top surface of the pad are the site parameters for which the SAR has satisfactorily demonstrated that the cask will not overturn or slide.

Comment C.6: One commenter questioned what happens to the berm or wall used as a shield during a tornado, hurricane, or earthquake and questioned the composition of the berm.

Response: The use and composition of berms or walls are beyond the scope of this rulemaking for the cask design. If an engineered feature is needed to satisfy the requirements of 10 CFR 72.104(a), then these features are to be considered important to safety and must be evaluated to determine applicable quality assessment category on a site specific basis as required by Section 4.4.7 of the TSs. The cask design does not rely on engineered features to meet the Section 72.106 post-accident dose rate requirement.

Comment C.7: One commenter questioned what would happen if a seismic event occurred while the transfer cask was attached to the top of the concrete shield.

Response: This is not a design basis event for approval of the cask design's capability to safely store spent fuel. Section 72.212(b)(4) requires the general licensee to determine whether activities related to the storage of spent fuel involve any unreviewed safety question or change in the facility TSs, as provided under 10 CFR 50.59.

Comment C.8: One commenter questioned if the drop test considered the condition of materials at the end of cask life.

Response: As noted in SAR Section 11.2.11 and SER Section 3.3.9, the 6-inch end drop will exert a maximum axial deceleration of less than 20 g to the TSC components and the spent fuel assemblies. This g-load is much smaller than the design basis impact load of 56.1 g for which the cask system structural integrity has satisfactorily been demonstrated. Because the margin of safety is large and the material's strength is not expected to degrade, the NRC believes that the cask system will remain capable of withstanding a 6-inch cask drop accident throughout the 20 year storage period.

Comment C.9: One commenter asked a number of questions related to the Boral panels concerning whether the Boral poison remains in place under accident conditions, including cask tipover; the necessity of the Boral panels; how the Boral is manufactured and tested; the content of the Boral; the continued efficiency over time; and whether the panels can structurally deform.

Response: The Boral panels are necessary for ensuring that the NAC-MPC system meets 10 CFR Part 72 requirements for criticality safety. Each Boral poison panel is held in place by a stainless steel cover plate that is welded around its perimeter to the outer wall of the fuel tube. The applicant has shown that impact loads greater than those expected in storage accidents, including a postulated cask tipover, produce maximum stresses in the seal weld that are a small fraction of the weld material's ultimate strength. The NRC staff has found no credible mechanisms for deforming the poison panels in a way that would lead to loss or reduced effectiveness of the panels. Warping of the panels in relation to the tube walls to which they are attached is prevented by the welded stainless steel cover plates.

Boral will be manufactured and tested under the control and surveillance of a quality assurance and quality control program that conforms to the requirements of 10 CFR Part 72, Subpart G. A statistical sample of each manufactured lot of Boral is tested by the manufacturer using wet chemistry procedures and/or neutron attenuation techniques. The specified minimum content of the neutron poison in the Boral panels (*i.e.*, 0.01 grams of ^{10}B per cm^2) is ensured by the acceptance testing procedures described in SAR Section 9.1.6.

Boral has been used in the nuclear industry since the 1950's and used in baskets since the 1960's. Several utilities have also used Boral in spent fuel storage racks. Industry experience has revealed no credible mechanisms for a loss of Boral efficacy in the cask.

Comment C.10: One commenter asked how important the minimum flux trap width is to criticality safety and whether it can be altered in an accident.

Response: The minimum flux trap width is an important design parameter in limiting the system's maximum neutron multiplication factor (k_{eff}) under normal and accident conditions. Bounding structural analysis performed by the applicant indicate that flux trap widths may be slightly reduced as a result of side-impact loads from a postulated cask tipover accident. The NRC staff has analyzed the reactivity effects from hypothetical flux trap deformations well beyond those expected from tipover accidents and concludes that the resulting increases in k_{eff} are minuscule in relation to the large overestimates of k_{eff} arising from the conservatisms used in the applicant's criticality calculations. These conservatisms include modeling the spent fuel as though it were fresh, assuming flooding of the cask interior with unborated water, crediting only 75 percent of the minimum neutron poison content of Boral panels, assuming all major dimensions and parameters of the basket components and fuel contents are at their most reactive tolerances limits, and assuming the most reactive lateral shifting of all basket components and contents.

Comment C.11: One commenter questioned why lateral shifting of tubes in disk holes was not a concern and stated that it should not be allowed because you can not be sure what happens in all cases.

Response: Lateral shifting of the fuel tubes within their disk holes is not a concern because the criticality analysis presented in SAR Section 6.4.3.2 has adequately accounted for tube shifting variations in identifying and analyzing the most reactive configurations of the basket and contents.

Comment C.12: One commenter asked for clarification on what is meant by pure water, whether this meant unborated water. The commenter further questioned whether uneven flooding was a concern and if the analysis had been checked.

Response: Pure water is unborated water. Uneven flooding is not a concern because the basket components are designed to allow the free flow of water between the interior and exterior of the fuel tubes. Prevention of uneven flooding within and outside the fuel tubes ensures that the flux traps function as analyzed in limiting the maximum k_{eff} of the system. The NRC staff has checked and confirmed the applicant's analysis and conclusions regarding the design's ability to prevent uneven flooding of the basket.

D. Design

Comment D.1: One commenter recommended that canister identification be added on the top of the structural lid per the requirements of 10 CFR 72.236(k).

Response: The NRC agrees with the comment. SAR Drawings 455–871 and –872 have been revised to show that the structural lid of the transportable storage canister is steel stamped with its model number, unique identification number, and empty weight.

Comment D.2: One commenter recommended that the number of hose connections be increased to 8 around the transfer cask near the bottom to improve the forced air cooling capability.

Response: The NRC agrees with the comment. Although the original design with two hose connections remains acceptable, increasing the number of hose connections to eight will more evenly distribute the cooling service air supply around the bottom of the transfer cask. The changes have been made to the SAR.

Comment D.3: One commenter recommended that an alternative slip-on flange detail be permitted at the top of the fuel tube versus the butt welded flange detail indicated on the drawing. The commenter further stated that the flange should be attached with continuous full fillet on interior of fuel tube with intermittent weld on exterior.

Response: The NRC agrees with the comment, as the alternative detail provides the same integrity as the original butt weld design. SAR Drawing 455–881 has been revised to show that the flange at the top of the fuel tube is attached to the tube using a continuous fillet weld on the interior of the tube.

Comment D.4: One commenter stated that the venting of hydrogen should not be allowed because of the associated fire or explosion hazard. The commenter further stated that the design should not be certified if hydrogen is generated.

Response: The NRC disagrees with the comment. As noted in SAR Section 3.4.1.2.2, the applicant anticipates that no hydrogen gas is expected to be detected before, or during, the loading or unloading operations. However, in the event that a reaction between the aluminum heat transfer disks and the spent fuel pool water occurs, the loading and unloading procedures of SAR Chapter 8, which include procedures to detect and remove hydrogen from the space between the shield lid and the top of the water during any welding or cutting operations, provide adequate assurance that the welders will be protected. Further, the NRC has licensed other storage casks that utilize aluminum heat transfer components, including 10 TN–32 casks and 2 NAC-I28 casks. Loading of these casks has not resulted in unsafe conditions for the workers.

Comment D.5: One commenter objected to allowing the storage of Reconfigured Fuel Assemblies (RFA) in the same cask as intact fuel assemblies and believed there should be separate analysis and certificates. The commenter questioned whether the RFAs would remain in position during handling, storage, and possible unloading, or if they would float in a reflood and if the tubes would remain leaktight. The commenter asked about the composition of an RFA. The commenter asked how much the ''debris'' weighs, how dryness is assured, and how the utility can ensure that the cask is not overloaded and that the weight is properly distributed.

Response: The NRC disagrees with the comment. The individual RFA tubes are positioned in a stainless steel container with perforated top and bottom end plates that retain the tubes for all conditions. The individual tubes have plugs at each end to retain their contents. The plugs are trapped in place by the top and bottom end plates. A loaded RFA weighs about 550 pounds and will remain in position for all conditions. Neither the container nor the individual tubes are closed, so they will drain as a canister is emptied and will refill (if canister reflooding is ever necessary) as the canister is filled. Thus, an RFA will not float. Additional description of the RFAs can be found in SAR Section 2.1.2.

No actual weighing of the contents will be done. A conservative maximum weight of contents is analyzed in each fuel assembly location in the basket for each authorized loading configuration. The weight of an actual fuel assembly is always less than that analyzed. The debris that is contained in an RFA cannot exceed the weight of one fuel rod in each of the 64 stainless steel tubes. Because PWR fuel assemblies contain 179 (14x14 assembly) fuel rods or more, the weight of the RFA with only 64 fuel rods is much less than the conservative weight of contents that is analyzed.

The intact or damaged spent fuel rods and fuel debris are loaded into the individual RFA tubes under water. Each tube has a drain hole in each end. There is a perforated plate on the top and bottom ends of the RFA container to permit drainage but retain gross particles and pieces of debris. Thus, as the transportable storage canister is drained, the RFA tubes and container are drained as well. The double vacuum drying cycle specified in the TSs and described in the canister loading procedures ensures the removal of any residual water for the canister and from the RFA.

The slight variation in load distribution due to one or more RFAs has been considered and is bounded for all loading evaluations. Consideration of a fully loaded configuration bounds any reduced loading configuration. The potential for slight unevenness in loading does not affect canister handling because the 3-point lifting arrangement maintains the canister vertical for all lifts.

Comment D.6: One commenter recommended calling the inlet a drain or flow tube to avoid worker confusion.

Response: The NRC disagrees with the comment. The components are labeled to reflect their intended function for loading operations and are shown as such on the drawings. For wet unloading operations, the components are properly called out in the SAR procedures with respect to the drawings. The NRC considers it appropriate to label components to reflect their intended routine function under normal operations.

Comment D.7: One commenter stated that the cask label should clearly identify the contents of the cask, indicating if the cask contains damaged fuel and the type of cladding and that the label should be stainless steel so it won't rust.

Response: The NRC disagrees with the comment. Each stainless steel canister structural lid is stamped to identify the model number, unique identification number, and empty weight. Additionally, each vertical concrete cask has a stainless steel nameplate attached that identifies the model number, unique identification number and empty weight. These markings meet the requirements of 10 CFR 72.236(k). Space is provided in both instances for the addition of cask user specified information; however, the specific identification of cask contents is not required for the permanent markings affixed to the cask. The NRC notes that § 72.212(b)(8) requires each general licensee to accurately maintain a record for each cask that lists the spent fuel stored in the cask. This record must be maintained by the cask user until decommissioning of the cask is complete.

Comment D.8: One commenter questioned why only Yankee class fuel could be stored in the cask. The commenter further questioned whether burnable poison rod assemblies and TPAs would eventually be stored in the cask and if so, stated that the evaluation should be completed before the CoC is issued.

Response: Each cask approval is specific and limited to the contents requested by the applicant, that in this case, is for spent fuels designated as ''Yankee Class'' within the application. Future changes to the authorized contents, if any, including different spent fuel assemblies and other radioactive materials associated with fuel assemblies, must be requested and approved in accordance with the regulations of 10 CFR Part 72.

Comment D.9: One commenter stated that the documents should make it clear that no control components should be used in an RFA and that any empty position needs a dummy rod.

Response: The NRC agrees with the comment and notes that the Fuel Assembly Limits (Table 2–1 of the TS) specify that intact fuel assemblies and RFAs shall not contain control components, and that any missing fuel rods in an intact fuel assembly shall be replaced with a dummy rod.

Comment D.10: One commenter asked how the lifting slings were attached and if they had ever been tested. The commenter indicated that a dry run should be performed.

Response: SAR Section 1.2.1.4.8 describes the use of the load rated rigging attachments and slings. All slings are designed to have adequate safety margin to meet the requirements of ANSI N14.6 and NUREG–0612 for lifting heavy loads. The administrative controls of the TS require the cask user to perform dry runs of certain evolutions prior to initial loading. These controls specify that the dry runs will include the heavy load activities of moving the concrete cask, moving the transfer cask, and lowering the canister into the concrete cask.

Comment D.11: One commenter asked how the transfer cask is attached to the concrete cylinder, how high up in the air is the transfer cask, and what is located in the vicinity that the cask could fall on.

Response: As depicted in SAR Figure 1.1–1 and described in SAR Section 8.1.2, after the transfer adapter plate is bolted to the concrete cask top, the transfer cask, with the TSC in place, is brought to rest on the transfer adapter by aligning the transfer cask bottom door rails and connector tees with the adapter plate rails and door connectors. In this configuration, the bottom of the transfer cask is about 160 inches above the bed of a heavy-haul trailer on which the concrete cask is rested. The evaluation of a transfer cask drop is governed by NUREG–0612, ''Control of Heavy Loads at Nuclear Power Plants,'' that is subject to site-specific evaluations and is beyond the scope of this rulemaking.

Comment D.12: One commenter stated that the mockup needs to clearly work for opening and unloading demonstration evaluations.

Response: The NRC agrees with the comment. The administrative controls incorporated in the TSs require that a mockup, if used in place of an actual canister for dry runs, shall demonstrate the activities necessary to open and unload a canister.

Comment D.13: One commenter asked whether structural lids meant the structural and shield lids. The commenter asked several questions about the shield plug concerning whether the NS–4–FR serves the same function as the RX–277 in the VSC–24, if the NS–4–FR was encased in the carbon steel, why carbon steel is used instead of stainless steel (concern over rusting), where the shield plug is located, and if the carbon steel is coated.

Response: The transportable storage canister has a 3-inch shield lid and a 5-inch structural lid. After the loaded canister is placed in the concrete cask, a shield plug is installed over the canister. The shield plug is comprised of 1 inch of NS–4–FR and 4.125 inches of carbon steel. The NS–4–FR is encased in carbon steel. Then, a 1.5-inch thick carbon steel lid is used to seal the concrete cask. The carbon steel is coated with either Keeler and Long E-series epoxy enamel or Ameron PSX738 Siloxane. Therefore, rusting is not a concern. As noted in SER Section 5.1.2, NS–4–FR is a solid borated polymer used for neutron shielding. The RX–277 in the VSC–24 cask design is used as a neutron shielding material in the top plug assembly. The cask designer determines the materials to be used for the cask.

Comment D.14: One commenter stated that ignoring full shielding on the bottom of the cask was a mistake and that the bottom plate needed to be evaluated for better shielding.

Response: The NRC disagrees with the comment. Full shielding on the bottom of the cask is not necessary to provide adequate protection for the public. The calculated occupational doses have been reviewed and have been found to be acceptable. See also the response to B.3.

E. Welds

Comment E.1: One commenter asked how much water is to be drained before welding and stated that the water level should be set as a criteria.

Response: In SAR Chapter 8, Operating Procedures, the cask end user is directed to drain approximately 50 gallons of water from the canister.

Comment E.2: One commenter asked how various welds are checked and tested, and if they were leak tight (could water seep in adding weight). The commenter indicated that the welding procedures were very important.

Response: The examination and testing of welds is described in SAR Sections 9.1.1, 9.1.2 and 9.1.3. Leakage of the confinement boundary is not anticipated because all shop welds are volumetrically and surface examined in accordance with the governing ASME Code's requirements. Field welds (*i.e.* shield lid, structural lid and port cover plates) of the confinement boundary are liquid penetrant examined. In addition, the field weld on the shield lid is leak tested to ensure that it is leaktight. These examinations ensure that the welds will not leak.

Comment E.3: One commenter stated that there should not be any exceptions on the maximum flaw size for a weld that is allowed, the criteria should be clear (including temperature limits). The commenter questioned why the postulated cracks under each liquid penetrant (PT)-examined surface were not required to be additive for comparison to the critical flaw size.

Response: The NRC accepts examination of the cask closure welds in accordance with Interim Staff Guidance-4, Revision 1 that allows the use of a multi-layer (*i.e.* progressive) PT examination in lieu of a volumetric examination. As stated in the ISG, the critical flaw size is determined in accordance with ASME Section XI methodology and is used to determine the spacing between successive PT examination layers. There is enough experience with the progressive PT method to conclude with reasonable assurance that it will detect flaws that are open to the surface and are of a size that would affect the serviceability of the weld. The probability of a flaw of this size not being detected because it did not break the surface is not very high because the liquid penetrant test is undertaken at intermediate weld pass levels. Thus, the concept of adding up theoretical undetected flaw sizes under each PT layer in a way that the sum could be greater than the determined critical flaw size is not considered plausible by the NRC. For the NAC–MPC canister, which is composed of ductile stainless steel, no restriction has been placed on its movement based on permissible flaw sizes.

Comment E.4: One commenter asked about concerns with corner welds of tubes and if they could bend at the corners.

Response: The square fuel tube is fabricated with a full-length longitudinal weld along the center line of one of the four sides of the tube. Weld examination and testing are described in SAR Sections 9.1.1.1 and 9.1.1.2. There are no tube corner welds and, therefore, no concerns with bending the fuel tube at its corners, as suggested.

Comment E.5: One commenter asked what is meant by galling of a weld.

Response: Galling is excessive wear in the region of contact between load bearing surfaces, *i.e.* bolt threads during torquing, or trunnions on a component like a *transport* cask where the lifting device rotates in contact with the trunnions. For the vertical load test of the transfer cask, the loading fixture should not rotate with respect to the trunnions, and thus, galling of the trunnions is not expected to occur. The trunnion welds are inspected for permanent deformation or cracking, and the trunnion load bearing surfaces are inspected for permanent deformation and galling.

Comment E.6: One commenter questioned whether both the structural and shield lids were ultrasonic tested (UT) because the SER claimed the lids provided redundant sealing and the commenter didn't think the claim should be made if they were not both UT tested. The commenter questioned what a progressive penetrant test was and why it could be used instead of the UT. The commenter further stated that the progressive penetrant test should not be allowed for the confinement boundary welds if it was not in agreement with ASME Section III, Class I requirements.

Response: As stated in SAR Section 9.1.1.1 ''Nondestructive Weld Examination,'' the shield lid has a root and final pass liquid penetrant (PT) examination and the structural lid could have either ultrasonic examination or a progressive PT examination. For the shield lid weld, the liquid penetrant examinations of the root and final surface, the pneumatic pressure test, and the subsequent liquid penetrant re-examination have been accepted by the NRC staff as adequate for demonstrating the weld integrity.

The basis for the structural lid weld examination methods is documented in the NRC's Interim Staff Guidance-4, Revision 1 that allows the use of a multi-layer (*i.e.*, progressive) PT examination in lieu of a volumetric examination. Because the shield lid and structural lid are both welded and examined, this constitutes compliance with the redundant sealing requirement of 10 CFR 72.236(e).

Comment E.7: One commenter stated that a helium leak test of the shield lid was inadequate to provide seal reliability and that a UT should be completed.

Response: The NRC disagrees with the comment. For the type of welding process, the environmental conditions near the weld, and the stainless steel weld base material, there are no known delayed cracking mechanisms that could cause the weld to crack after it has been inspected. Therefore, the liquid penetrant examinations of the root and final surface, the pneumatic pressure test and subsequent liquid penetrant examination, and the helium leak test conducted in accordance with the leak-tight criteria of ANSI N14.5 have been accepted by the NRC staff as meeting the requirements of 10 CFR 72.236(e) for redundant sealing of the confinement boundary.

Comment E.8: One commenter stated that time frame for calibrating UT equipment was very important.

Response: NRC agrees with the comment in that calibration of any equipment used in applications affecting quality needs to be assured. In addition, 10 CFR 72.164 ''Control of Measuring and Test Equipment'' and 10 CFR 50, Appendix B, XII, ''Control of Measuring and Test Equipment'' provide the regulatory foundation of a licensee's quality assurance program to ensure that these calibrations take place.

Comment E.9: One commenter stated that the results of a PT examination need to be permanent and that criteria should be established for permanent records. The commenter requested information on what is required to keep records permanent.

Response: 10 CFR Part 72, Subpart G, requires that records pertaining to the design, fabrication, erection, testing, maintenance, and use of systems, structures, and components important to safety shall be maintained until decommissioning of the cask is complete. This includes cask closure welds which are important to safety. Criteria for records is given in Subpart G.

Comment E.10: One commenter questioned what was meant by ''sufficient'' and indicated that there should be specific criteria for acceptability of a PT exam because ''sufficient'' is not an acceptable criteria. The commenter also questioned what was meant by in the field in the performance of welding.

Response: The NRC accepts PT examination of field welds (meaning those that are *not* made in the fabricators shop but are made at the location where the spent fuel is being loaded) for the root and final weld passes. For the port covers the welds are relatively small (*i.e.* ¼ inch) fillet welds that do not lend themselves to volumetric examination techniques nor progressive PT examinations, and the welds are not subject to any significant loadings which means they basically perform a sealing function. Therefore, the NRC believes that PT examination of the port cover plate root and final welds is adequate. Additionally, the closure weld of the structural lid will be either progressively PT examined or UT'd at the option of the licensee. The acceptability of the progressive PT examination is documented in NRC's Interim Staff Guidance-4, Revision 1. The term ''sufficient'' was used in reference to the actual number of intermediate layers of PT examinations necessary to detect critical flaws. For the NAC–MPC ''sufficient intermediate layers'' means that in addition to the root and final weld passes, each successive ⅜ inch weld thickness will also be PT examined as shown on SAR Drawing 455–872.

Comment E.11: One commenter questioned why the backing ring is not considered in analysis and how the ring affected the timing, equipment, and worker dose for the unloading procedures in cutting the cask.

Response: The backing ring is utilized to aid in the welding process. During the welding operation, it effectively reduces fit up time and welding time without compromising weld integrity. The NRC does not believe that the inclusion of backing rings would impose any additional worker exposure during an unlikely unloading operation and when weighed against dose saved during welding, results in an overall reduction in dose compared to not using a backing ring.

Comment E.12: One commenter questioned how structural and shield lid welds were cut open, what equipment was used, whether shims were used, and how the shims were removed (commenter did not think that shims should be used). The commenter also asked how falling debris is avoided.

Response: The NAC–MPC design does not use shims for positioning the shield lid or structural lid on the canister. The operating procedures for removal of the structural lid, the vent and drain port covers, and the shield lid are included in Section 8.3 of the NAC–MPC SAR. Detailed site-specific procedures for these activities will be developed by the cask user. The adequacy of these specific procedures will be evaluated by the licensee.

F. Structural Evaluation

Comment F.1: One commenter recommended that the certification for the NAC–MPC canister system be withheld because NAC has not considered information that questions the structural integrity of the NAC cask system to withstand a 30-foot drop test. The information is contained in Singh, K.P. and Max DeLong, ''A Structural Assessment of Candidate Fuel Basket Designs for Storage and Transport of Spent Nuclear Fuel'' (Presented at the INMM Conference, Washington, D.C., January 14–16, 1998).

Response: The NRC disagrees with the comment. The cask-drop test requirements are for transport consideration that is beyond the scope of this rulemaking. Certification of the NAC–MPC for listing under 10 CFR 72.214 can only be used by the general licensee to store, not transport, spent fuel. However, the cask, including the fuel tube has been evaluated for a side impact load of 55 g, that bounds the side impact load associated with a cask tipover accident. The evaluation has satisfactorily demonstrated structural integrity of the system for its storage configuration. There is no basis for withholding the certification for the NAC–MPC storage canister system as suggested.

Comment F.2: The same commenter objected to the NRC staff's discussion, in an NRC letter dated August 25, 1999, to D. Lochbaum regarding the Singh and DeLong paper, which the commenter interpreted as ''crediting'' NAC's design as conservative by considering the structural properties of portions of the internal basket system and other items. In the commenter's view, allowing design ''credit'' for portions of the overall structure not intended to provide gross structural support undermines the entire cask drop requirement. The commenter believed that the NAC–MPC system should not be certified if it does not have adequate external structure to withstand the drop test and protect the irradiated fuel bundles within the cask.

Response: Although the 30-foot drop test is not an explicit Part 72 requirement, the applicant referenced, in part, the NAC–STC transportation cask 30-foot analysis. Sections 2.7.8 and 2.7.9 of the SAR for the NAC–STC transportation cask, Docket 71–9235, evaluate structural integrity of the fuel tube under a side impact load of 55 g. The analysis considers the approach and information consistent with those discussed in the paper by Singh and DeLong. With no credit given to the basket structural properties other than the fuel tube and its interaction with the support disks, the analysis has demonstrated that the fuel tube is capable of withstanding a cask-drop test, thus, protecting the irradiated fuel bundles within. Because the load also bounds the side impact load associated with the cask tipover accident, the fuel tube is demonstrated to be capable of maintaining its structural integrity in a cask tipover accident. Moreover, the NRC staff notes that in a November 2, 1999, letter to Mr. Block to offer his comment on NRC's August 25, 1999, communication to Mr. Lochbaum, Dr. K.P. Singh, the senior author of the paper, indicated that he had neither reviewed NAC's design documents nor been in a position to comment on the nuances of NAC's design.

Comment F.3: One commenter asked about the structural soundness of the inlet parts as it relates to withstanding the stress and pressure from the lifting jack use, and whether the inlets could be damaged or deformed by using the jack.

Response: The structural design and analysis of the air cooling inlets when serving as bearing surfaces for lifting the storage cask are described in SAR Section 3.4.3.1. The stress analysis results show that the air inlets are structurally capable of withstanding all forces associated with the cask lifting operation and could not be damaged or deformed by using the jack. SAR Section 8.1.3 describes a procedure for operating the air pads and lifting jacks to transport the concrete cask. The jacks are installed at the bottom of the air inlet without the inlet screens in place. Any effects resulting from use of the air pads or lifting jacks is readily visible for inspection.

Comment F.4: One commenter inquired about a Nelson stud anchor and the TSC support pedestal. The commenter asked if the pedestal took the place of the tiles used in the VSC–24 cask, why the pedestal used 2 inches of carbon steel instead of ceramic or stainless steel because of a concern over rusting, how the pedestal is attached to the VCC bottom plate, how high is the pedestal, and if the pedestal could shift or deform during handling. The commenter further asked if the force had been calculated for possible adherence of the metal surfaces after rusting.

Response: The term ''Nelson stud'' is a trade name for headed steel studs used for developing anchoring action between reinforced concrete and its steel liner plate. SAR Drawing 455–861 provides design details on how Nelson studs are welded to the cask bottom plate and the air inlet top so that the bottom plate and the concrete wall will act as an integral part to achieve its structural support function. As depicted in the same SAR drawing, the 23-inch high pedestal is a carbon steel weldment that consists of two major structural part, a 2-inch thick horizontal circular pedestal plate for providing direct bearing surface to the TSC and a connecting vertical ring plate assembly as a load path to transmit the TSC inertia load to the cask bottom and storage pad. If carbon steel is exposed to moist air, it may corrode. Detail B–B of SAR Drawing 455–862 shows that a ¼-inch thick stainless steel plate is installed between the TSC bottom and the pedestal plate, in addition to an ⅛-inch thick BISCO insulation. This cover is installed on a sheet of fire block insulation that isolates the TSC from the VCC carbon steel base plate. This construction will prevent the pedestal plate from rusting to the canister bottom. Therefore, no adherence force will develop to cause any shifting, deforming, or cracking of the pedestal plate in handling, as suggested.

Comment F.5: One commenter asked if there would be any deformation of the fuel tubes in a tipover or drop. The commenter further asked how the tubes and disks respond to each other when stressed and how they affect each other.

Response: The support disk cutouts and the fuel tubes are sized to avoid binding when the cask is kept in its upright position. In a cask tipover accident, the support disk ligaments are in contact with fuel tubes and will provide support to fuel assembly inertia loads. Sections 2.7.8 and 2.7.9 of the safety analysis report for the NAC–STC transportation cask, Docket 71–9235, analyzes stresses and strains of the fuel tubes for cask side-drop tests. SAR Section 11.2.12.3.3 evaluates structural performance of the support disks for bounding impact loads. As concluded in SER Section 3.3.8, both the fuel tubes and support disks have been shown to behave satisfactorily for a cask tipover accident.

Comment F.6: One commenter asked about the energy balance method used for estimating impact loads and whether it considered elastic-plastic deformation.

Response: The energy balance method, as used in SAR Section 11.2.11, assumes that the potential energy associated with a 6-inch vertical drop of the TSC is dissipated by plastic deformation of the steel support pedestal. By considering the maximum force associated with the crushed area of and the corresponding flow stress in the pedestal support ring assembly, the method provides a conservative estimate of a height reduction of the air inlet region by 0.35 inches that has been evaluated to be acceptable.

Comment F.7: One commenter questioned why the NRC did not consider a cask tipover off the air pad in movement or from a transporter tipover. The commenter asked what kind of deformation (from a tipover) is acceptable. The commenter further asked if the cask could roll after it is tipped over and what would happen if it rolled into a ditch. The commenter indicated that the transport path should be evaluated (potholes, snow, ice, gravel, *etc.*).

Response: The tipover and bottom end drop analyses form part of the structural design basis for the NAC–MPC system design. NAC described the VCC drop and tipover analyses in SAR Sections 11.2.11 and 11.2.12. The NRC's evaluation of the vendor's analyses is described in the corresponding SER Sections 3.3, 11.2.11 and 11.2.12. The NRC found the results of these analyses to be satisfactory in that the calculated stresses were within the design requirements. Before using the NAC–MPC system, the general licensee must evaluate the foundation materials to ensure that the site characteristics are encompassed by the design bases of the approved cask. The events listed in the comment are among the site-specific considerations that must be evaluated by the licensee using the cask.

Comment F.8: One commenter asked if dry unloading is evaluated for this cask as implied by finding F3.10 and if it is it should be discussed more fully in the SER and TSs.

Response: The SAR procedures only address wet loading and unloading fuel from the NAC–MPC storage cask. Dry loading or unloading procedures are not included with this application and were not a part of the NRC staff's review. The SER was modified to indicate that the materials are compatible with wet loading and unloading operations and facilities.

G. Thermal Evaluation

Comment G.1: One commenter questioned whether the EPRI Report could be used for stainless steel clad fuel. The commenter further stated that 430° C must be the limit.

Response: The NRC disagrees with the implication that improper cladding temperature limits were established. Because the NAC-MPC is designed to store both stainless steel clad and zircaloy clad fuel, the most restrictive temperature limit was used for both the short term and long term storage. These temperature limits bound both types of cladding and therefore, segregating the fuel is not necessary. For general information, the short term temperature limit of 806° F and 430° C are the identical temperature except they are on different temperature scales.

Comment G.2: One commenter asked about the gas in the fuel rods contained in RFAs concerning what it is and whether it will come out over time.

Response: The fuel contained in the RFAs is by definition failed fuel or fuel that has cladding defects. Therefore, it is reasonable to assume that any fission product gases have been released from the rods before to placement into the MPC and that any residual gases have been further reduced to negligible amounts after vacuum drying the canister and purging it with helium.

Comment G.3: One commenter questioned whether 200°F is conservative enough for the water temperature during loading operations because of possible defects in measuring devices.

Response: Defects in temperature measuring devices would not result in an operational safety problem. As a result, Technical Specification 3.1.1 has been deleted (see response to comment H.6). The operating procedures now impose a 20-hour time limit supported by analysis to prevent the water in the canister from approaching boiling during welding operations and through draining.

Comment G.4: One commenter questioned whether 24 hours for the helium filled canister to be in the pool is adequate to cool the canister before restarting loading operations. The commenter asked how a helium filled canister reacts in the pool and if an analysis has been conducted. The commenter also asked if the term ''drying'' meant the same thing as ''cooling''.

Response: In Limiting Condition for Operation (LCO) 3.1.5, the term ''drying'' means vacuum drying where the spent fuel cladding temperature rises due to the lack of a surrounding medium to remove heat. The term ''cooling'' refers to either in pool cooling or external forced air cooling supplied through the eight connections at the bottom of the transfer cask where the air is forced inside the transfer cask and directed up the outside of the canister, cooling the outside of the canister. As stated in the bases section of the TSs, the temperature of the fuel cladding, based on analysis, will be below 466°F after 24 hours of either in pool cooling or forced air cooling considering an assumed maximum decay heat loading. Therefore, after in pool cooling or forced air cooling, the maximum time to place the canister in the concrete cask is 25 hours (refer to revised LCO 3.1.6.2) that will result in a cladding temperature less than the limit of 806°F, based on analysis. LCO 3.1.6.2 was revised to correct an editorial error on the time duration. As discussed above, the thermal analysis and TS bases support a 25-hour time duration instead of the 15-hour duration previously specified.

Also, under LCO 3.1.5, if the LCO time limits are not met, the transfer cask with the helium filled canister can be placed in the spent fuel pool for cooling. No reaction is anticipated between the helium-filled canister and the pool because the canister is made of corrosion resistant material. Water is prevented from entering the canister since the shield lid welding operations have been completed and by the quick disconnect fittings. Therefore, the helium filled canister placed in the pool is bounded by the standard loading configuration when pool water is in direct contact with the basket internals.

Comment G.5: One commenter asked for clarification of the required actions for LCO 3.1.6 and for forced air cooling.

Response: If the time limits stated in LCO 3.1.6 are not met, one required action is to begin air cooling of the canister by supplying cooling air through the eight connections at the bottom of the transfer cask. This supplies forced air cooling to the outside surface of the canister before exiting out the top of the transfer cask. This action is allowed at the licensee's option in lieu of in pool cooling. As stated in the bases for the subject LCO, this forced air cooling (250 CFM of air at 75°F maximum) is sufficient to maintain the fuel cladding below 644°F (*i.e.*, the long term temperature limit) when cooled in this manner for at least 24 hours. However, because this is a short term event, the short term temperature limit for the fuel cladding (*i.e.*, 806°F) is applicable. Therefore, the time limit of 25 hours that is applicable after the forced air cooling is stopped until the canister is placed in the concrete cask does not result in a temperature rise that would cause the short term cladding temperature limit to be exceeded. No temperature measurements are required to be taken during this action because analysis provides the justification for this approach. If something went wrong (*e.g.*, air supply lost) during cask loading evolutions, the licensee would have the option of placing the helium filled canister in the spent fuel pool. TS 3.1.10 has been added to address time limitations for canister removal from a concrete cask to another concrete cask or the NAC–STC transport cask.

Comment G.6: One commenter questioned if there was an outlet air temperature for air cooling. The commenter further questioned whether forced air cooling works, if it had ever been tested and checked, and what happens if it does not work. The commenter stated that the short-term temperature limits must be maintained.

Response: For forced air cooling of the canister with air supplied at the transfer cask's eight lower connections at a rate of 250 cfm and maximum temperature of 75° F, no monitoring of the outlet air temperature is required. Cooling in this configuration has been evaluated by analysis. See also the response to comment G.5 for a discussion of meeting short term temperature limits.

Comment G.7: One commenter questioned whether cooling water recirculation flow had ever been tried and tested, how long it takes to connect and disconnect the system, and if the flow was through the in pool condenser unit. The commenter asked if there were emergency plans if the system does not work adequately.

Response: The section of the technical specifications associated with monitoring the temperature of the water in the canister during loading operations has been deleted (see response to comment H.6). However, monitoring of the water temperature is a part of the operating procedures. Based on analysis, cooling of the water will not be needed based on analysis because 20 hours is a reasonable amount of time to complete the associated operations of shield lid welding, pressure test, and draining. However, if it appears that there is not enough time to complete these operations, contingencies like recirculating cooling water through an in pool heat exchanger or placing the transfer cask back in the fuel pool will be available through planning, procedures and rehearsal before actually loading fuel. The cooling of the water is not critical to this loading operation or to maintaining the cladding temperature limit. However, the presence of water is necessary for shielding. Therefore, as long as the water level is maintained, it will perform its shielding function.

Comment G.8: One commenter asked where and how the external temperature is measured.

Response: The external temperature refers to an outside ambient temperature representative of the environment in which the transfer cask might be used. The method of measuring ambient temperatures is a site-specific consideration for the NAC-MPC system user and should be employed using good engineering practice.

H. Technical Specifications

Comment H.1: One commenter indicated that the concrete and soil specifications do not meet the inclusion criteria of 10 CFR 72.44 and should not be included in the Technical Specifications.

Response: The NRC disagrees that the specifications can be removed at this time. The NRC staff determined that the concrete and soil specifications proposed by the applicant were acceptable for ensuring that the cask remains within the design envelope. In order to remove this specification, technical justification is necessary and may be accomplished through the amendment process. Concrete and soil specifications are useful for establishing the site parameter conditions to ensure that once they are met, the impact force associated with a cask tipover accident is bounded by the design basis load considered in evaluating the storage cask. By complying with these specifications, a user is relieved of the burden of calculating the cask impact force for a tipover accident.

Comment H.2: One commenter requested that the TS for the ISFSI pad concrete compressive strength be changed to less than 4,000 psi at 28 days.

Response: The NRC agrees with the comment. SAR Section 11.2.12 has considered a concrete compressive strength of 4,000 psi for the ISFSI pad bounding this revision. The staff also considered a concrete compressive strength of 4000 psi in its SER. SAR Section 4.4, Appendix A of Chapter 12, ''Site Specific Parameters and Analysis,'' Item 6c, has been revised to read: ''$\leq$ 4,000 psi at 28 days.''

Comment H.3: One commenter requested that TS for the ISFSI pad concrete density be changed to $125 \leq \rho \leq 150$ lbs/ft^3.

Response: The NRC agrees with the comment. NAC's additional calculations with a concrete density up to 150 lbs/ft^3 have shown the maximum impact force of < 45 g, the bounding impact loading considered in SAR Section 11.2.12. SAR Section 4.4, Appendix A of Chapter 12, has been revised as suggested.

Comment H.4: One commenter requested that the soil density upper limit TS be modified to read ''$85 \leq \gamma \leq 130$ lbs/ft^3.''

Response: The NRC agrees with the comment. NAC's additional calculations with a soil density up to 130 lbs/ft^3 have shown a maximum impact force of < 45 g, which is bounding. SAR Section 4.4, Appendix A of Chapter 12, has been revised as suggested to provide flexibility in the selection of available material.

Comment H.5: One commenter requested that a tolerance of ± 50 be included with this site specific parameter for soil stiffness in order to accommodate soil variability. The commenter recommends that the soil stiffness be expressed as $200 \leq k \leq 300$ psi/inch, where k is the sub-grade modulus.

Response: The NRC agrees with the comment. NAC's additional calculations with a soil stiffness up to 300 psi/in have shown a maximum impact force of < 45 g, which is bounding. Because the lower limit soil stiffness is not meaningful for determining the maximum cask tipover impact force, it need not be considered a soil site parameter. SAR Section 4.4, Appendix A of Chapter 12, ''Site Specific Parameters and Analyses,'' Item 6f, has been revised to read: ''$k \leq 300$ psi/in.''

Comment H.6: One commenter recommended that LCO Section 3.1.1, ''Canister Water Temperature'' and its basis be removed from the TSs because this process variable does not represent a significant risk to the public health and safety and is not consistent with the inclusion criteria of 10 CFR 72.44. The commenter recommends that the TS be modified to add air cooling of the canister as an alternative.

Response: The NRC agrees with the comment that the canister water temperature technical specification can be removed from Chapter 12 because defects in temperature measuring devices would not result in an operational safety problem. The operating procedures of Chapter 8 of the SAR have been modified to remove the reference to the subject LCO and to include the 20-hour time limit associated with the rise in canister water temperature after its removal from the spent fuel pool to the completion of draining operations. This limit is necessary to ensure that water remains in the canister for shielding purposes but is not critical to ensuring adequate cooling of the fuel cladding. However, vacuum drying and transfer operations are both controlled by time limits through the TSs because they contribute significantly to the temperature rise of the fuel cladding during these loading operations.

Comment H.7: One commenter noted that the time for vacuum drying is not defined consistently in the TSs and recommended the use of ''completion of canister draining operations'' as the definition. The commenter also recommended revising the bases section of the TS to address forced air cooling.

Response: The NRC agrees with the comment. The associated surveillances in Surveillance Requirement (SR) 3.1.5.1 and SR 3.1.5.2 have been changed to monitor elapsed time from the completion of canister draining operations until the start of helium backfill. Also, the NRC agrees that forced air cooling (at 250 CFM with 75°F maximum air temperature for 24 hours minimum) be permitted as an alternative cooling method under the required actions section of LCO 3.1.5.

Comment H.8: One commenter recommended that LCO 3.1.5.2 be revised to clarify the term ''in pool cooling'' and to revise the Required Action to allow air cooling.

Response: The NRC disagrees with the comment and believes the LCO, including the term ''in pool cooling,'' is adequate. The comment lacks specifics as to what is being proposed and if some other cooling configuration is planned then details regarding that cooling arrangement need to be presented.

Comment H.9: One commenter recommended that the Technical Specifications contain a consistent definition of the time duration in LCO 3.1.6.1 and SR 3.1.6.1.

Response: The NRC agrees with the comment. However, the initiation of the time duration has been modified to ''from the introduction of helium backfill'' to be consistent with the previous LCO 3.1.5 and not ''from the completion of backfilling'' as requested in the comment. The consistency between LCO's 3.1.5 and 3.1.6 is necessary to avoid any unaccounted time for heatup of the canister and contents during loading operations.

Comment H.10: One commenter requested that the 1,000 cfm value in Required Action A.2.1 of LCO 3.1.5 and the supporting bases be changed to 250 cfm.

Response: The NRC agrees with the comment. Air at 250 cfm with 75°F maximum temperature for 24 hours minimum is an adequate cooling rate. The Required Action and the bases have been changed. Required Action A.1.2

was also changed to add eight connections to supply cooling air instead of the current two connections to ensure even air distribution around the canister.

Comment H.11: One commenter recommended that the Bases for SR 3.1.6.2 be revised to allow forced air cooling.

Response: The NRC agrees with the comment and has added the words ''or forced air cooling'' to the last sentence in the Bases Section SR 3.1.6.2, because forced air cooling is a permissible cooling option.

Comment H.12: One commenter recommended that the TS for fuel cooldown requirements addressing wet unloading be clarified to only be applicable for licensees maintaining spent fuel pools beyond dry fuel storage or be deleted.

Response: The NRC agrees with the comment. The intent of the first note in LCO 3.1.7 was that this technical specification only applies to wet unloading operations using a spent fuel pool. Interim Staff Guidance No. 2, ''Fuel Retrievability'' and No. 3, ''Post Accident Recovery and Compliance with 10 CFR 72.122(i)'' state that spent fuel pools are not required to be maintained for dual purpose designs.

Comment H.13: One commenter noted an inconsistency between the SAR and TSs concerning the canister pressure test value and stated that the correct value is 50 psig.

Response: The NRC agrees with the comment. However, because the test pressure is not invoked by other parts of the technical specification, it has been removed from the table for canister limits. The operational procedures remain unchanged and still specify a 50 psig pressure test.

Comment H.14: One commenter recommended that the TSs be revised to reflect the latest NRC-accepted format, *i.e.,* the UMS TSs.

Response: Large-scale changes to re-format the NAC–MPC TS similar to those of the NAC–UMS or other cask rulemakings should be incorporated through the amendment process. Focused comments modeled after the NAC–UMS regarding the implementation of individual technical specifications have been addressed separately and incorporated in this rulemaking action.

Comment H.15: One commenter stated that the note for LCO 3.1.7 concerning applicability should be located at the top of the page because it was confusing where it is currently located.

Response: The NRC disagrees with the comment. The note is directly below the APPLICABILITY statement and is intended to clarify the operations for which the technical specification is applicable. The APPLICABILITY statement and its location are in accordance with the standard format for technical specifications.

Comment H.16: One commenter stated that TS 3.1.7 should be clarified to make it clear that the transport operations mentioned are limited to onsite transport to and from the pad.

Response: The NRC disagrees with the comment. The term TRANSPORT OPERATIONS is clearly defined in the technical specification DEFINITIONS and includes all activities involved in moving a loaded NAC–MPC concrete cask and canister to and from the ISFSI pad. Further clarification of the term is not warranted.

Comment H.17: One commenter asked what is meant by the terms ''outside of the fuel handling facility'' and ''external to the facility'' in LCO 3.1.9. The commenter further questioned whether this TS could be used for dry transfer at the pad.

Response: The terms ''outside of the fuel handling facility'' and ''external to the facility'' refers to handling operations of a transfer cask outside of a covered or heated facility as described in the Bases for the TS. The intent of the specification is to ensure that the structural integrity of the transfer cask and its capability to handle and shield a loaded canister is maintained for the temperatures experienced by the ferrous materials of the transfer cask.

A dry unloading operation of spent fuel in the canister was not requested or explicitly described in the SAR and thus is not currently allowed for the NAC–MPC system and is beyond the scope of this rulemaking. The NAC–MPC system is designed to facilitate, using the transfer cask, the dry transfer of a closed canister to the NAC–STC transport cask without the need to unload the canister in a pool. This dry transfer from a vertical concrete cask used for storage to the NAC–STC transport cask would be carried out at a facility that meets both the heavy-loads and overall regulatory requirements for licensed operation, and could be located at or adjacent to the ISFSI pad. Site-specific evaluations and procedures for these operations, consistent with the technical basis established in the storage and transport cask SARs, are required to be developed by the cask user.

Comment H.18: One commenter stated that utilities should not be allowed to use the provisions of Surveillance Requirement (SR) 3.0.2 repeatedly and that allowance for operational convenience should not be provided.

Response: The NRC disagrees with this comment. As stated in the Bases for this specification, the 25 percent extension facilitates surveillance scheduling and considers facility conditions that may not be suitable for conducting the surveillance. The 25% extension does not significantly degrade the reliability that results from performing the surveillance at its specified frequency because the most probable result of any particular surveillance being performed is a verification of conformance. This provision is consistent with the standard format for TSs.

Comment H.19: One commenter stated that the Bases for TS 3.1.1 should describe what is meant by ''transfer cask and canister in position'', what is meant by on top of the concrete shell and the actual height, and the doors that open at the base and how they work in loading and unloading. The commenter further asked if the procedures had been evaluated for the reverse in unloading and if a dry run had been conducted. The commenter also thought that sampling for water temperature should begin at 12 hours instead of 18 hours.

Response: The background section of the Bases for TS 3.1.1 contains an appropriate amount of detail for an overview of canister and transfer cask operations pertinent to the specification of maximum canister water temperature. Further descriptions of transfer operations are located in Chapters 1 and 8 of the SAR and the NRC staff's SER, including a description of the transfer cask relative to the concrete cask during transfer operations, component dimensions that detail the height of the concrete cask and transfer cask designs, and operation of the shield doors during transfer operations. The start time for monitoring water temperatures was determined based on a bounding conservative analysis found to be adequate by the NRC staff. Detailed site-specific loading and unloading procedures are to be developed by the cask user based on the technical basis established in the SAR . The performance of site-specific dry runs including a canister unloading procedure before the initial system loading is specified in the TS as Administrative Control 5.2.

In response to comment G.3, TS 3.1.1 and its associated Bases have been removed. The NRC staff agrees that the monitoring of canister water temperatures is more appropriately controlled in the detailed site-specific operating and welding procedures. Because the welds are ultimately examined for acceptance, there would be an insignificant benefit to health and safety of the public by controlling the canister water temperatures in the TS.

I. Miscellaneous

Comment I.1: One commenter asked what kind of deformation of the cask was acceptable in the 30-foot drop test.

Response: The 30-foot drop test is a hypothetical accident condition in 10 CFR Part 71 and is not evaluated for storage. The comment is beyond the scope of this rule.

Comment I.2: One commenter questioned the use of a heavy haul trailer instead of a transporter.

Response: A heavy-haul trailer is described in the application as the method for moving the loaded vertical concrete cask from the fuel handling facility to the ISFSI pad. The method of transport is a site-specific consideration and is subject to the required evaluations under 10 CFR 72.212 to be performed by the cask user to ensure that the NAC–MPC system is used within its analyzed design basis.

Comment I.3: One commenter asked the definition for a post-shutdown decommissioning activities report (PSDAR).

Response: A PSDAR is required to be submitted by reactor licensees no later than 2 years after the permanent cessation of operations. The PSDAR describes planned decommissioning activities, a schedule for accomplishment of significant milestones, an estimate of expected cost, and documents that environmental impacts associated with site-specific decommissioning activities have been considered in previously approved environmental impact statements. The licensee must submit a license amendment request if all of the environmental impacts of decommissioning have not been considered in existing environmental assessments.

Comment I.4: One commenter asked how a lift limit of 3 inches for air pad use could be enforced and whether an air pad has ever failed. The commenter further questioned what happens if an air pad deflates or bursts while in use. The commenter also asked how smooth the pad needs to be for air pads to work, if they can work over ice, and how they are removed.

Response: The maximum lifting height of 6-inches maintains the NAC–MPC system within the design and analysis basis during transport operations of the loaded concrete cask to the ISFSI pad. The NAC–MPC system has been evaluated and found acceptable for a 6-inch VCC drop that bounds the failure of the air pad. An air pad creates an air ''filler'' between the inflated air cushion and the supporting surface. A reasonably smooth supporting surface, such as an ISFSI pad, facilitates optimum performance of an air pad. From a performance standpoint, an air pad would be able to work over a supporting surface coated with ice, although this is obviously not a desired condition for cask movement operations. It is the general licensee's responsibility to limit the VCC lifting height to allowable values. The lift height requirements are specified in TS LCO 3.1.8. Surveillance requirements require verification that VCC lifting requirements are met after the VCC is lifted to install or remove the air pad, and prior to moving the VCC to and within the ISFSI.

Comment I.5: One commenter stated that the inlet and outlet vents (and screens) need to be checked for blockage due to snow and ice, bird nests, leaves, sand, etc., and that the screens should be cleaned. The commenter asked how the outlets are visually inspected each day and asked if the inlets and outlets were non-planar.

Response: The TSs require the cask user to establish a thermal monitoring program for each cask. The program entails daily measurements of inlet and outlet air temperatures and visual inspection of the inlets and outlets or other appropriate actions for any unexplained reading. As a result of the daily surveillances, appropriate actions are to be taken in response to abnormal indications that would include the clearing of any blockages associated with the air passages. The cooling air pathways are non-planar and designed to minimize radiation streaming at the inlets and outlets.

Comment I.6: One commenter asked that the acceptably low amount of water and potentially oxidizing material remaining in the TSC be specified.

Response: The term ''acceptably low amount of water and potentially oxidizing material remaining in the TSC'' refers to the 1 gram-mole limit for oxidizing species recommended in PNL–6365, ''Evaluation of Cover Gas Impurities and Their Effects on the Dry Storage of LWR Spent Fuel.'' As stated in this report, if the amount of oxidizing species is less than the 1 gram-mole limit, damage to the fuel cladding as a result of fuel oxidation will be precluded.

Comment I.7: One commenter asked the difference between a suction pump and a vacuum pump, and why a suction pump is used. The commenter further questioned the amount of water removed, the basis for the specific amount, and why the quantity is not the same for each plant.

Response: A suction pump is used to remove water from the canister cavity. Approximately 50 gallons of water corresponding to an air space of about 3 inches by 70 inches in diameter are removed from every cask (independent of which plant is using the cask) to keep moisture away from the regions that need to be welded (*e.g.,* shield lid-to-shell weld, *etc.*). Removal of this amount of water is adequate to perform the welding operations and still provide enough shielding to the workers performing the welding and inspection operations. On the other hand, a vacuum pump is used to remove residual moisture, air, and other gases during vacuum drying after all of the water has been removed from the TSC. Removal of the water and vacuum drying reduce the quantity of oxidizing species in the cask to below 1 gram-mole recommended in PNL–6365, ''Evaluation of Cover Gas Impurities and Their Effects on the Dry Storage of LWR Spent Fuel.'' As stated in this report, if the amount of oxidizing species is less than the 1 gram-mole limit, damage to the fuel cladding as a result of fuel oxidation will be precluded. The amount of water removed is specific to this cask-design to facilitate welding operations and for ALARA considerations, and is not appropriate as a specific criterion for other cask designs.

Comment I.8: One commenter asked if all water evaporates due to the vacuum, even the water in gas or in solids, and fuel debris inside the tubes.

Response: After most of the water has been removed from the cask, there may be a small amount at the bottom of the cask trapped in crevices or other small confined spaces that the suction pump cannot remove. The combination of the heat from the spent fuel and the low pressure (i.e., 3 mm mercury pressure) during vacuum drying will aid in the removal of residual water and moisture from the cask. As noted in the previous response (response to comment I7), the vacuum drying procedures described in SAR Section 8.1 will ensure there is less than 1 gram-mole of oxidizing species in the TSC.

Comment I.9: One commenter questioned the makeup of the pool water, whether the canister changed the composition, what kind of chemical reactions can take place, whether they have been evaluated, and who checks the water.

Response: The maintenance of the spent fuel pool water chemistry is beyond the scope of a 10 CFR Part 72 cask review. However, a Part 72 cask review does include consideration of chemical and galvanic reactions that may take place while a storage canister and associated hardware are in the spent fuel pool. The materials employed for the transfer cask and the TSC are compatible with wet loading and unloading operations and facilities, and no reactions that affect the spent fuel pool chemistry or water quality are expected.

Comment I.10: One commenter asked who the experienced fabricators are who will ensure the process chosen for a durable cask.

Response: In general, NRC reviews and approves the applicant's quality assurance (QA) program as described in SAR Chapter 13. However, the cask user is ultimately responsible for ensuring the fabricator's QA programs comply with 10 CFR Part 72, Subpart G. Additionally, most storage cask fabricators are certified by the American Society of Mechanical Engineers and are N-Stamp Certificate holders. The N-Stamp Certificate is a certificate that enables a vendor to fabricate certified components for nuclear applications.

Comment I.11: One commenter asked if the characteristics of the epoxy enamel have been checked and considered, and referred to a problem at Trojan concerning curing time.

Response: For the NAC–MPC cask, the applicant demonstrated in SAR Section 3.4.1 that there will be no adverse reactions caused by the epoxy enamel coating. The NRC concurs with the SAR evaluation and concludes the designs of the TSC and transfer cask meet the regulatory requirements. The NRC staff has reviewed the problems at Trojan with basket coatings and has concluded that the Trojan issues do not affect our acceptance of the NAC–MPC coating.

Comment I.12: One commenter questioned whether cobalt impurity and other contaminants had been fully evaluated for interaction concerns in storage and unloading.

Response: The level of cobalt impurity and other contaminants have been evaluated in determining the source term and dose rates that are applicable to loading, storage, and unloading operations. The cobalt and other contaminants are mainly gamma emitters that will increase the dose rate on the surface of the concrete cask. The source term and dose rate evaluations have been reviewed and have been found to be acceptable.

Cobalt is an unintended impurity element that is incorporated in fuel component materials during fabrication. Accordingly, there is such a small amount of cobalt (*i.e.,* parts per million concentration) and other impurities in fuel component hardware that no reactions with other cask components during loading, storage, or unloading is expected.

Comment I.13: One commenter asked what transfer operations ocur in loading and unloading in relation to the use of lead bricks in the transfer cask.

Response: Section 3.1.4.2 of the SER indicates that the temperature of the lead bricks during transfer operations are well below the melting point of this material. The use of the words ''transfer operations'' in this sentence refers to the time that the TSC is loaded inside the transfer cask. Thus, the highest temperature that the lead bricks will experience (*i.e.,* 191°F, as noted in SAR Section 4 and Table 4.1–4) is expected to occur only when the TSC contains design basis fuel and is loaded inside the transfer cask.

Comment I.14: One commenter asked what temperatures would be expected if vacuum drying or helium refill took longer than expected.

Response: In general, the longer vacuum drying or helium transfer takes, the higher the temperatures will be. The rate at which these temperatures would increase is shown graphically in SAR Figure 4.4.3–5, ''History of Maximum Component Temperatures for the Nominal Transfer Conditions''. However, the temperatures of components like the fuel cladding are prevented from exceeding their respective temperature limit of 806°F by imposing time limitations during vacuum drying and helium transfer operations. If these time limits are exceeded, required actions are imposed that would prevent the temperature limits from being exceeded.

Comment I.15: One commenter asked what happens if the fuel reaches the temperature limit when conducting a ultrasonic test and if the test is done when the TSC is in the transfer cask.

Response: The welding during loading operations and their associated examinations are performed while the canister is in the transfer cask. The NAC–MPC is designed and operated to preclude the spent fuel from reaching its cladding temperature limits. Therefore, the possibility of performing a UT examination (which is optional to the licensee in lieu of a progressive PT) while the fuel cladding is at its maximum temperature limit is very remote, if not non-existent. However, if the licensee was concerned that the cladding temperature limit was being approached, the licensee would follow the technical specifications and initiate forced air cooling or in pool cooling, and there would be no adverse consequences.

Comment I.16: One commenter asked how can a cask user be certain of the temperature of the lead in the transfer cask. The commenter further questions whether the cask user would know if the lead slumps and hot spots form on the outside of the transfer cask.

Response: The temperature of the lead being below its melting point is assured by design analysis, thermal testing of the first loaded canister above a threshold heat load, and by operating procedures. During unloading, if the canister was placed in the transfer cask for a relatively long period of time (approximately 48 hours for maximum decay heat load) without commencing the cool down in accordance with LCO 3.1.7, some material temperature limits could be exceeded. Therefore, a new LCO 3.1.10 has been added to provide restrictions on the time a canister can be in the transfer cask during unloading operations.

Comment I.17: One commenter questioned how the NS–4–FR neutron shielding could have a high hydrogen content and be fire resistant. The commenter further questioned if hydrogen gas could be created from the neutron shielding.

Response: The NS–4–FR material consists of many elements including hydrogen. The chemistry of the material (*e.g.,* the way the elements are bonded to one another) contribute significantly to the fire retardant capability of the NS–4–FR. Even though the material contains hydrogen, the ingredients were selected so that the NS–4–FR resists fire and hydrogen gas generation that could cause the material to combust.

Comment I.18: One commenter asked if all the chemical analysis for a cask drop or tipover in the transfer cask had been evaluated for possible interaction due to water leaks or gas generation.

Response: Cask drops and tipover analyses of the transfer cask are beyond the scope of the review.

Comment I.19: One commenter questioned why the word ''if'' was used in describing the need for girth welds. The commenter stated that they should know if it is needed.

Response: The NRC agrees with the comment. The SAR drawings indicate that both seam and girth welds will be used to fabricate the TSC. The SER has been modified accordingly.

Comment I.20: One commenter asked about lead slumping.

Response: Lead slumping is a term that describes the metal flow processes that can occur due to impact, stress, or softening at temperatures close to the melting point of lead (e.g., around

600°F). This phenomenon would only be a concern for the lead that is in the annulus of the transfer cask while the TSC is contained inside. When the transfer cask is not being used, the lead is assumed to be at ambient temperatures. Further, the calculated maximum temperature of the lead during transfer of the TSC from the spent fuel pool facilities to the VCC is 191°F under the conditions the applicant has analyzed in SAR Section 4.4.3. Because this temperature is significantly lower than the melting temperature, no softening or flow of lead in the annulus due to lead slumping is expected.

Comment I.21: One commenter asked how the fuel debris could affect unloading if it clogs the drain tubes during reflooding and stated that this issue should be addressed along with the operating procedures to transfer a loaded cask.

Response: Fuel debris is defined in the TS and is handled within individual fuel tubes in an 8 x 8 array within an RFA. The fuel tubes and RFA are designed to preclude the release of gross particles to the canister. Similar radiological precautions would need to be taken by the cask user for both the loading and the unloading evolution when handling fuel debris. The technical basis for the development of site-specific operating procedures for transferring a loaded canister to the NAC–STC for transport have been approved for Certificate of Compliance No. 71–9235.

Summary of Final Revisions

As a result of the staff's response to public comments, or to rectify issues identified during the comment period, the following items in the TSs have been modified: (1) TS Design Feature Section 4.4.6 (see comments H.2, H.3, H.4 and H.5); (2) TS LCO 3.1.5 (see comments H.7 and H.10); (3) TS LCO 3.1.6 (see comments H.9 and H.11); and (4) TS Table 3–1, Canister Limits (see comment H.13). In addition TS LCO 3.1.1 was deleted (see comments G.3, G.7 and H.6) and TS 3.1.10 was added (see comment G.5). The staff has also updated the CoC, including the addition of explicit conditions governing acceptance tests and maintenance program, approved contents, and design features, and has removed the bases section from the TSs attached to the CoC to ensure consistency with NRC's format and content.

The title of the SAR has been revised to delete the revision number so that in the final rule the title of the SAR is ''Final Safety Analysis Report for the NAC Multi-Purpose Canister (NAC–MPC) System.'' The staff has also modified the rule language by changing the word ''certification'' to ''certificate'.

Agreement State Compatibility

Under the ''Policy Statement on Adequacy and Compatibility of Agreement State Programs'' approved by the Commission on June 30, 1997, and published in the **Federal Register** on September 3, 1997 (62 FR 46517), this rule is classified as compatibility Category ''NRC.'' Compatibility is not required for Category ''NRC'' regulations. The NRC program elements in this category are those that relate directly to areas of regulation reserved to the NRC by the Atomic Energy Act of 1954, as amended (AEA), or the provisions of Title 10 of the Code of Federal Regulations. Although an Agreement State may not adopt program elements reserved to NRC, it may wish to inform its licensees of certain requirements via a mechanism that is consistent with the particular State's administrative procedure laws, but does not confer regulatory authority on the State.

Finding of No Significant Environmental Impact: Availability

Under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, the NRC has determined that this rule is not a major Federal action significantly affecting the quality of the human environment and therefore, an environmental impact statement is not required. This final rule adds an additional cask to the list of approved spent fuel storage casks that power reactor licensees can use to store spent fuel at reactor sites without additional site-specific approvals from the Commission. The environmental assessment and finding of no significant impact on which this determination is based are available for inspection at the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC. Single copies of the environmental assessment and finding of no significant impact are available from Merri Horn, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 415–8126, e-mail mlh1@nrc.gov.

Paperwork Reduction Act Statement

This final rule does not contain a new or amended information collection requirement subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). Existing requirements were approved by the Office of Management and Budget, approval number 3150–0132.

Public Protection Notification

If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

Voluntary Consensus Standards

The National Technology Transfer Act of 1995 (Pub. L. 104–113) requires that Federal agencies use technical standards that are developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical. In this final rule, the NRC is adding the NAC–MPC cask system to the list of NRC-approved cask systems for spent fuel storage in 10 CFR 72.214. This action does not constitute the establishment of a standard that establishes generally-applicable requirements.

Regulatory Analysis

On July 18, 1990 (55 FR 29181), the Commission issued an amendment to 10 CFR Part 72. The amendment provided for the storage of spent nuclear fuel in cask systems with designs approved by the NRC under a general license. Any nuclear power reactor licensee can use cask systems with designs approved by the NRC to store spent nuclear fuel if it notifies the NRC in advance, the spent fuel is stored under the conditions specified in the cask's CoC, and the conditions of the general license are met. In that rule, four spent fuel storage casks were approved for use at reactor sites and were listed in 10 CFR 72.214. That rule envisioned that storage casks certified in the future could be routinely added to the listing in 10 CFR 72.214 through the rulemaking process. Procedures and criteria for obtaining NRC approval of new spent fuel storage cask designs were provided in 10 CFR Part 72, Subpart L.

The alternative to this action is to withhold approval of this new design and issue a site-specific license to each utility that proposes to use the casks. This alternative would cost both the NRC and utilities more time and money for each site-specific license. Conducting site-specific reviews would ignore the procedures and criteria currently in place for the addition of new cask designs that can be used under a general license, and would be in conflict with NWPA direction to the Commission to approve technologies for the use of spent fuel storage at the sites of civilian nuclear power reactors without, to the maximum extent practicable, the need for additional site reviews. This alternative also would tend to exclude new vendors from the business market without cause and would arbitrarily limit the choice of cask designs available to power reactor licensees. This final rule will eliminate the above problems and is consistent with previous Commission actions. Further, the rule will have no adverse effect on public health and safety.

The benefit of this rule to nuclear power reactor licensees is to make available a greater choice of spent fuel storage cask designs that can be used under a general license. The new cask vendors with casks to be listed in 10 CFR 72.214 benefit by having to obtain NRC certificates only once for a design that can then be used by more than one power reactor licensee. The NRC also benefits because it will need to certify a cask design only once for use by multiple licensees. Casks approved through rulemaking are to be suitable for use under a range of environmental conditions sufficiently broad to encompass multiple nuclear power plants in the United States without the need for further site-specific approval by NRC. Vendors with cask designs already listed may be adversely impacted because power reactor licensees may choose a newly listed design over an existing one. However, the NRC is required by its regulations and NWPA direction to certify and list approved casks. This rule has no significant identifiable impact or benefit on other Government agencies.

Based on the above discussion of the benefits and impacts of the alternatives, the NRC concludes that the requirements of the final rule are commensurate with the Commission's responsibilities for public health and safety and the common defense and security. No other available alternative is believed to be as satisfactory, and thus, this action is recommended.

Small Business Regulatory Enforcement Fairness Act

In accordance with the Small Business Regulatory Enforcement Fairness Act of 1996, the NRC has determined that this action is not a major rule and has verified this determination with the Office of Information and Regulatory Affairs, Office of Management and Budget.

Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the NRC certifies that this rule will not, if promulgated, have a significant economic impact on a substantial number of small entities. This rule affects only the licensing and operation of nuclear power plants, independent spent fuel storage facilities, and NAC. The companies that own these plants do not fall within the scope of the definition of ''small entities'' set forth in the Regulatory Flexibility Act or the Small Business Size Standards set out in regulations issued by the Small Business Administration at 13 CFR Part 121.

Backfit Analysis

The NRC has determined that the backfit rule (10 CFR 50.109 or 10 CFR 72.62) does not apply to this rule because this amendment does not involve any provisions that would impose backfits as defined in the backfit rule. Therefore, a backfit analysis is not required.

List of Subjects 10 CFR Part 72

Criminal penalties, Manpower training programs, Nuclear materials, Occupational safety and health, Reporting and recordkeeping requirements, Security measures, Spent fuel.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 553; the NRC is proposing to adopt the following amendments to 10 CFR part 72.

PART 72—LICENSING REQUIREMENTS FOR THE INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE

a. The authority citation for Part 72 continues to read as follows:

Authority: Secs. 51, 53, 57, 62, 63, 65, 69, 81, 161, 182, 183, 184, 186, 187, 189, 68 Stat. 929, 930, 932, 933, 934, 935, 948, 953, 954, 955, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2071, 2073, 2077, 2092, 2093, 2095, 2099, 2111, 2201, 2232, 2233, 2234, 2236, 2237, 2238, 2282); sec. 274, Pub. L. 86–373, 73 Stat. 688, as amended (42 U.S.C. 2021); sec. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); Pub. L. 95–601, sec. 10, 92 Stat. 2951 as amended by Pub. L. 10d–48b, sec. 7902, 10b Stat. 31b3 (42 U.S.C. 5851); sec. 102, Pub. L. 91–190, 83 Stat. 853 (42 U.S.C. 4332); secs. 131, 132, 133, 135, 137, 141, Pub. L. 97–425, 96 Stat. 2229, 2230, 2232, 2241, sec. 148, Pub. L. 100–203, 101 Stat. 1330–235 (42 U.S.C. 10151, 10152, 10153, 10155, 10157, 10161, 10168).

Section 72.44(g) also issued under secs. 142(b) and 148(c), (d), Pub. L. 100–203, 101 Stat. 1330–232, 1330–236 (42 U.S.C. 10162(b), 10168(c),(d)). Section 72.46 also issued under sec. 189, 68 Stat. 955 (42 U.S.C. 2239); sec. 134, Pub. L. 97–425, 96 Stat. 2230 (42 U.S.C. 10154). Section 72.96(d) also issued under sec. 145(g), Pub. L. 100–203, 101 Stat. 1330–235 (42 U.S.C. 10165(g)). Subpart J also issued under secs. 2(2), 2(15), 2(19), 117(a), 141(h), Pub. L. 97–425, 96 Stat. 2202, 2203, 2204, 2222, 2244, (42 U.S.C. 10101, 10137(a), 10161(h)). Subparts K and L are also issued under sec. 133, 98 Stat. 2230 (42 U.S.C. 10153) and sec. 218(a), 96 Stat. 2252 (42 U.S.C. 10198).

b. In § 72.214, Certificate of Compliance 1025 is added to read as follows:

§ 72.214 List of approved spent fuel storage casks.

* * * * *

Certificate Number: 1025.
SAR Submitted by: NAC International.
SAR Title: Final Safety Analysis Report for the NAC Multi-Purpose Canister System (NAC–MPC System).
Docket Number: 72–1025
Certificate Expiration Date: April 10, 2020.
Model Number: NAC–MPC.

Dated at Rockville, Maryland, this 24th day of February, 2000.

For the Nuclear Regulatory Commission.

Carl J. Paperiello,

Acting Executive Director for Operations.

[FR Doc. 00–5588 Filed 3–8–00; 8:45 am]

BILLING CODE 7590–01–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2000–NE–06–AD; Amendment 39–11619; AD 2000–05–10]

RIN 2120–AA64

Airworthiness Directives; General Electric Company GE90–85B Series Turbofan Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule; request for comments.

SUMMARY: This amendment adopts a new airworthiness directive (AD) that is applicable to General Electric Company GE90–85B series turbofan engines. This action requires removing from service aft mount whiffletrees prior to reaching a new cyclic life limit, and replacing with serviceable parts. This amendment is prompted by a reassessment of the low cycle fatigue capability of the engine mount system due to an increase in engine and propulsion system weight. The actions specified in this AD are intended to prevent aft mount