
Regulatory Analysis for Final Rule - 10 CFR Part 72 License and CoC Terms

**U.S. Nuclear Regulatory Commission
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EXECUTIVE SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) plans to publish a final rule (RIN: 3150-AI09) [NRC-2008-0361] amending its regulations to clarify the license term limits for dry storage cask Certificates of Compliance (CoCs) and independent spent fuel storage installation (ISFSI) licenses.

The final rule will improve regulatory efficiency by providing a consistent basis for the scope, applicability, and terminology of CoCs and Part 72 ISFSI general license regulations to better align CoC regulatory requirements with ISFSI general license requirements. The amended regulations will also provide consistency between the Part 72 ISFSI general and specific license requirements.

Section 2 summarizes the technical basis for this rulemaking. Section 3 identifies the two alternatives evaluated in this rulemaking: no action and implementation of the final rule. Section 4 describes the analysis method and input assumptions. Section 5 presents the results and Section 6 presents the decision rationale. Section 7 lists the references used in this Regulatory Analysis. Appendix 1 provides input assumptions used in this Regulatory Analysis, current as of November 2009, including the names of storage casks, names of the licensed ISFSI locations, names of licensees pursuing a Part 72 general license, and names of licensees who had not at that time announced plans for ISFSI licensing. Appendix 2 provides input assumptions used in this Regulatory Analysis. Minor changes were made in the input assumptions used to support the final rule compared to the input assumptions used to support the proposed rule. There were no comments submitted during the proposed rule public comment period on the input assumptions used in the Regulatory Analysis.

This Regulatory Analysis provides an evaluation of two alternatives, one of which is taking no action and the other is implementing the final rule. The results show that the final rule will save either \$1.3 million or \$0.9 million over a 40 year analysis period (2008 dollars using a 3 percent or a 7 percent discount rate, respectively) compared to making no changes in the regulations. Most of the labor by licensees, CoC holders and the NRC staff is modeled in this regulatory analysis as a one-time event. Although these activities will occur in different years, the effort will occur only once in the 40 year analysis period and was modeled as occurring in the first year to simplify the analysis. Annual savings are modeled for Part 72 general licensees and the NRC staff as a result of amending 10 CFR 72.212(b)(4) to remove the requirement of the general licensee to submit an exemption request to apply changes authorized by an amended CoC to a cask loaded under the initial CoC or an earlier amended CoC. The NRC will benefit the most from the final rule, due to the submittal of fewer license renewal applications during the 40 year analysis period. The savings achieved by industry are due primarily to more efficient management of cask expiration dates, after the initial term, and ISFSI license expiration dates, as well as preparation of fewer exemption requests seeking to apply CoC amendments to previously loaded casks.

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ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CoC	Certificate of Compliance
COMSECY	A paper originating from a Commissioner who wants to bring an item to the attention of his or her fellow Commissioners, or a paper that originates from the NRC Executive Director for Operations (EDO), the Chief Financial Officer (CFO), or other Commission-level office seeking guidance from the Commission.
FR	Federal Register
INL	Idaho National Laboratory
ISFSI	Independent Spent Fuel Storage Installation
NRC	Nuclear Regulatory Commission
SAR	Safety Analysis Report
SECY	A paper addressing policy, rulemaking, or adjudicatory matters submitted to the Commission for consideration in a document style and format established specifically for the purpose.
SER	Safety Evaluation Report
SOC	Statements of Consideration
SRM	Staff Requirements Memorandum

1. INTRODUCTION

The NRC is amending regulations in Part 72 of Title 10 of the Code of Federal Regulations (CFR) to clarify the license term limits for dry storage cask CoCs and ISFSI licenses, provide consistency between the general license requirements and the specific ISFSI license requirements, and allow Part 72 general licensees to implement changes authorized by an amended CoC to a cask loaded under the initial CoC or an earlier amended CoC (a “previously loaded cask”). The Commission directed this rulemaking through a Staff Requirements Memorandum (SRM) for SECY-06-0152, dated August 14, 2006, as supplemented, by SRM for COMSECY-07-0032, dated December 12, 2007. The proposed rule was published in the *Federal Register* on September 15, 2009 (74 FR 47126).

Specifically, the amendments will allow for longer initial and renewal terms for Part 72 CoCs and licenses, clarify the general license storage term, clarify the difference between CoC “approval” and “renewal,” allow a licensee to apply the changes associated with a CoC amendment to a previously loaded cask without express NRC approval, provided the cask fully conforms to the terms, conditions, and specifications of the amended CoC, and make certain administrative and clarifying changes.

As of January 2010, there were 16 approved spent fuel storage cask designs listed in 10 CFR 72.214. However, because each amendment to a cask design is considered a separate and unique cask design, there were in practice 44 approved spent fuel storage cask designs including all amendments. As of November 2009, there were 15 Part 72 ISFSI specific licensees, 39 Part 72 ISFSI general licensees, and the licensees of another 16 power reactor sites were pursuing a Part 72 ISFSI general license. In November 2009, 13 power reactor sites had not announced intentions regarding an ISFSI. Appendix 1 provides detailed information as of November 2009 to support the analysis for this final rule, including the names of storage casks in use, names of the ISFSI locations, names of licensees pursuing a Part 72 general license, and names of licensees who have not announced plans for ISFSI licensing.

A description of the final rule and the need for the rule are discussed in the following two sections. Section 2 summarizes the technical basis for this rulemaking. Section 3 identifies the two alternatives evaluated in this rulemaking – a No Action alternative and an alternative assuming implementation of the rule. Section 4 describes the analysis method and input assumptions. Section 5 describes the Results. Section 6 discusses the Decision Rationale and Implementation of the preferred alternative, and Section 7 lists the References used in this regulatory analysis. Appendix 1 provides a listing of the approved storage casks and ISFSIs. Appendix 2 documents the input assumptions, which have not changed relative to those used for the proposed rule.

1.1 Description of the Actions Taken in the Final Rule

10 CFR Part 72 provides the requirements for: (a) specific ISFSI licenses, (b) CoCs for spent nuclear fuel dry cask storage systems, and (c) general licenses for ISFSIs at reactor sites. This rulemaking will affect the license terms for each type of license and CoC.

The first change is to extend the license term for Part 72 specific licenses from the current 20 years from the date of initial license issuance, or from the date of license renewal, to a length of time not to exceed 40 years from the date of issuance or license renewal. The exact

license term will be specified by the applicant in a license application. Current 10 CFR 72.42 specifies that the duration of a Part 72 specific license, either initial or license renewal, must be for a fixed period of time not to exceed 20 years from the date of issuance.

Another change is to extend the license term of a storage cask CoC from a period of at least 20 years to a period not to exceed 40 years. The current regulations require that the license applicant for a CoC submit a safety analysis report (SAR) showing that the cask is suitable for storage of spent fuel for a period of at least 20 years. The final rule will allow the CoC applicant, in a new CoC application, or the CoC holder, in a renewal application of a CoC, to submit the application for a proposed term not to exceed 40 years.

A general ISFSI license is available for use as long as the licensee is authorized to possess or operate a nuclear power reactor, under the provisions of Part 50. Therefore, the "term" for a general license is directly tied to the term of the associated Part 50 reactor license. However, the use of a specific cask design under a general license is otherwise tied to the CoC. If the license term of a storage cask CoC is extended to 40 years, the authority to use a specific cask design under a general license would also be extended to 40 years. Currently, the general licensee's authority to use a particular cask design for the storage of spent fuel in each cask fabricated under an approved CoC terminates 20 years after the date that the general licensee first uses the particular cask to store spent fuel. Under this final rule, the exact "term" to use a specific cask design under a general license will depend on action taken by the CoC holder to extend the term of the storage cask CoC. If the CoC holder does not extend the term of the storage cask, then the Part 72 general licensee may seek approval from the NRC for a renewal of the storage cask CoC.

Another action in this final rule allows general licensees to apply newer CoC amendments to previously loaded casks, provided that the loaded cask meets all terms and conditions of the amended CoC. Partial implementation of the changes in an amendment is prohibited as it would result in a cask that is in an unanalyzed condition and not fully compliant with any of the CoCs listed in 10 CFR 72.214. Currently, 10 CFR Part 72 does not allow for general licensees to apply changes authorized by CoC amendments to previously loaded casks without prior NRC approval, if the changes alter the terms or conditions of the CoC under which that cask was loaded. General licensees that want to implement such changes must apply to the NRC for an exemption.

The final rule evaluated in this regulatory analysis makes editorial corrections to other Part 72 rule text, but these corrections generate little or no impact on stakeholders or the NRC. For example, one rule text change that is considered to have no impact on stakeholders or the NRC is a change in terminology in 10 CFR 72.240 from CoC "reapproval" to CoC "renewal."

The final rule has no impact on Agreement States because 10 CFR Part 72 has a compatibility category of "NRC" which establishes regulatory program elements that cannot be relinquished to Agreement States under the Atomic Energy Act, as amended, or under provisions of Title 10 of the CFR.

1.2 Need for the Final Rule Actions

The amended regulations will improve regulatory efficiency by providing a consistent basis for the scope, applicability, and terminology of CoC and Part 72 ISFSI license regulations.

The amended regulations also will better align CoC regulatory requirements with ISFSI general license requirements.

2. TECHNICAL BASIS FOR THE FINAL RULE

Sections 2.1 through 2.5 provide the technical basis supporting the final rule. These sections cover (1) a longer term for an initial CoC application; (2) a longer term for a renewal CoC application; (3) the term limit for an approved storage cask design approved for use at a general site; (4) the implementation of later amendments to previously loaded casks; and (5) a new requirement for a CoC renewal application to include an aging management program related to the characteristics of the storage cask.

2.1 Specify a Maximum Term for an Initial CoC Application

Currently, Part 72 does not specify an explicit limit on the initial term of a CoC for a spent fuel storage cask design. The NRC has historically authorized 20 year initial terms, as supported by the requirements of 10 CFR 72.230(b) and 72.236(g), and the Statements of Consideration (SOC) in the *Federal Register* (FR) notice for the final rule that added the general license provisions to Part 72 (55 FR 29184; July 18, 1990). Section 72.230(b) specifies that for a cask design certified for transportation of spent fuel under 10 CFR Part 71, a SAR showing that the cask is suitable for storage of spent fuel for a period of at least 20 years must be included in an application for a CoC for a spent fuel storage cask design. Section 72.236(g) requires that the spent fuel storage cask must be designed to store the spent fuel safely for a minimum of 20 years. The referenced SOC indicate that, “[t]he Commission believes that 20-year increments are appropriate for such cask design approvals, after which designs may be renewed.” Furthermore, the 20-year initial term for a Part 72 CoC is consistent with the initial term of a specific ISFSI license specified in 10 CFR 72.42(a).

Final rule changes to 10 CFR 72.230(b) and 72.236(g) will change the length of the term from a minimum of 20 years to a maximum term not to exceed 40 years for an initial CoC application.

Although CoC license applicants will have the flexibility to request a longer than 20 year initial term under this final rule, the maximum initial term will be limited to 40 years because of relatively limited empirical data available to evaluate the long-term material degradation issues of dry spent fuel storage casks. In 2003 and 2004, during the review for the Surry and H. B. Robinson renewal applications, the staff evaluated technical data resulting from an NRC-supported research program at the Idaho National Laboratory (INL) and dry spent fuel storage casks used at Surry. Under the INL research program, INL opened and inspected a dry storage cask after the fuel had been stored for approximately 15 years. At Surry, several casks were also opened after less than 15 years of storage as a result of some faulty weather covers which were corrected. Summaries of the findings regarding the condition of the fuel and cask components follow:

(1) Cladding creep is a time-dependent change in the dimension of the cladding resulting from high temperature and stress. It was considered as a potential degradation mechanism during storage. Confirmatory inspection of the spent fuel stored at INL verified that

no cladding creep had occurred. The spent fuel in dry storage at Surry also supports this finding. The NRC staff expects very little to no fuel degradation at the end of an extended licensing period. The established limits for cladding temperature during storage, and continually decreasing level of cladding stress and temperature, further remove creep as a degradation mechanism. Assessment indicated that cladding creep would not be an issue.

(2) The NRC staff also expects limited degradation of other internal components because there are no significant corrosive influences in the inert environment, either for the fuel or for other components. The INL inspection verified that there was no indication of corrosion for any internal canister components. The NRC staff has also concluded that radiation levels are too low to significantly alter the properties of the metals for any storage canister components.

(3) At Surry, the helium-filled region used metallic seals as the first and second containment seals. These were the only safety-related seals.

(4) The other external components of the storage systems (which are exposed to weathering effects) would already be covered by an inspection and corrective action program, or routine maintenance, to ensure that any degradation will be identified and assessed for its importance to safety, and will be addressed through corrective actions to ensure continued safe operation of the storage system.

Based on these findings, the staff believes that with appropriate aging management and maintenance programs, term that do not exceed 40 years are reasonable without undue risk to the public or to the environment. License terms longer than 40 years would require additional information on the long-term material degradation of dry spent fuel storage casks and would need to be evaluated by the staff.

The flexibility to request a longer initial CoC term does not involve any change to the design criteria for spent fuel storage casks. Consequently, new cask designs will meet the same design requirements as previously certified designs. Each CoC applicant seeking a longer initial term must justify in its application that the proposed cask design and associated support/operational programs (for example, including surveillance and maintenance) are suitable for storage of spent fuel for that requested term. This regulatory change in the final rule will affect applicants who request a longer initial CoC term. The staff will develop regulatory guidance to address the additional analyses or measures necessary to justify CoC initial terms of greater than 20 years to a maximum of 40 years.

2.2 *Specify a Maximum Term for a Renewal CoC Application*

Current regulations do not specify the renewal term of a Part 72 CoC. The SOC referenced above (55 FR 29184) specify that the Commission believes that 20 year increments are appropriate for reapproval of a storage cask CoC and consistent with the 20 year license renewal period for specific licenses.

Final rule changes to 10 CFR 72.240(a) will provide CoC holders with the flexibility to request a reapproval term not to exceed 40 years.

For similar reasons as stated in Section 2.1, the NRC staff supports a renewal term not to exceed 40 years. If a CoC holder (applicant) requests a renewal term for a storage cask CoC, then the applicant must justify in the renewal application that the spent fuel storage cask design is suitable for the requested renewal term. This regulatory change in the final rule will affect applicants who request a CoC renewal term longer than 20 years. As planned for the change in term length for an initial CoC application, the staff will develop regulatory guidance to address the additional analyses or measures necessary to justify CoC renewal terms.

2.3 Clarify Term Limit for Cask Designs Approved for Use at General License Sites

A Part 50 power reactor licensee may use a Part 72 ISFSI general license for spent fuel storage as long as the Part 50 license is maintained. Under current regulations, the Part 72 ISFSI general licensee's authority to use an approved cask design terminates 20 years after the date that the general licensee first loads spent fuel into the cask. If the CoC expires in the interim, any loaded spent fuel storage casks of that design would need to be removed from service after a storage period not to exceed 20 years. Neither the regulation nor the associated SOC for the final rule promulgating the regulation are clear as to whether each individual cask, once it is loaded with spent fuel under a valid CoC, may remain in service for a full 20 years, or whether a "20 year clock" is started at each site with the first loading of a cask of a given design. The 20 year expiration date is approaching for a number of storage casks at several generally licensed ISFSIs. To remain in use, the storage cask terms will need to be extended. Since the use of a specific cask design under a general license is tied to the CoC, general licensees will depend on the certificate owners to obtain renewal from the NRC for the cask designs used at their sites. If this is done, the general license authority for the continued use of the storage cask terminates 20 years after the CoC renewal date. If the CoC expires before a renewal is approved, spent fuel storage casks of that design need to be removed from service after the storage period not to exceed 20 years.

Because (1) the use of a specific cask design under a general license is tied to the CoC and (2) the final rule will increase CoC terms from 20 years to up to 40 years, the Commission is amending 10 CFR 72.212(a)(3) to specify that the license for storage of spent fuel in each cask will terminate after that particular cask is first used by the general licensee for a length of time equivalent to the licensed lifetime as certified by the cask's CoC at the time of loading. If a CoC expires, casks of that design must be removed from service after a storage period not to exceed a length of time equivalent to the licensed lifetime as certified by the cask's CoC at the time of loading. However, if the cask's CoC is renewed, the general license will then terminate when the CoC for that particular cask design expires. This change is not only consistent with the intent of the current regulations for general licenses, but also updates the current regulations due to revisions in other sections of Part 72 in this rulemaking. This provision in the final rule will affect all general licensees.

2.4 Implementation of Later Amendments to Previously Loaded Casks

CoC amendments are routinely requested by the cask manufacturer or vendor (also referred to as the certificate holder). Upon NRC approval of a CoC amendment, general licensees can load empty casks meeting the technical specifications of that CoC amendment. However, general licensees that want to apply changes approved by a later CoC amendment to

a previously loaded cask must request an exemption from the NRC if such changes alter the terms or conditions of the CoC under which that cask was loaded. Even if a general licensee requested the certificate holder of the cask to submit an amendment request that is specific to the general licensee and obtained NRC approval for such an amendment, the general licensee could not apply this amendment to previously loaded casks. To take advantage of the CoC amendment under the current requirements, the licensee must apply to the NRC for an exemption.

The final rule will revise 10 CFR 72.212 to allow a general licensee to apply CoC amendment changes to a previously loaded cask provided that the licensee performs written evaluations meeting the requirements of 10 CFR 72.212(b). This process is parallel to an existing process which general licensees must follow before loading an empty cask under the general license. Specifically, Subpart K of Part 72 allows general licensees to select from the list of approved spent fuel storage casks from 10 CFR 72.214. Because the NRC has made a safety determination on each of the casks and amendments listed in 10 CFR 72.214, a later amendment that is codified by the NRC would automatically be included in the list. The final rule revision to 10 CFR 72.212 will require that, after application of the changes authorized by a CoC amendment, the loaded cask must conform to the terms and conditions of the subject CoC amendment.

This provision in the final rule will improve the effectiveness and efficiency of the regulatory process by reducing the regulatory burdens of both the NRC and general licensees. It will affect general licensees who desire to implement the changes from a later CoC amendment to a previously loaded cask.

2.5 CoC Renewal Application Requires Aging Analyses

In 2004, the Commission authorized the staff to approve 40 year license renewal terms for the specific license for the Surry ISFSI [Reference 1]. In doing so, the NRC imposed, by license condition, certain aging management requirements to be performed by the licensees. Licensees must develop aging management plans to evaluate performance characteristics of the storage casks at those sites over time. Because the regulations are being changed to allow general and specific licensees to use storage casks over a renewed term not to exceed 40 years, the NRC staff is amending regulations to ensure that licensees perform aging analyses and provide detail on these analyses in their renewal applications.

The final rule will amend 10 CFR 72.24(c) to specify that the license term for an ISFSI license cannot exceed 40 years and will amend Section 72.42(a) to require specific licensees to implement an aging management program, as described by the CoC holder in its renewal application. The final rule will also amend 10 CFR 72.240(c) to require the contents of the SAR for the cask renewal application to include aging analyses that demonstrate that structures, systems, and components important to safety will perform their intended function for the period of extended operation requested in the license renewal. This new requirement will apply to the CoC holder or to the Part 72 general licensee if the CoC holder does not apply for renewal of a particular cask. The aging management requirements for general licensees are tied to the CoC; if the storage cask CoC requires an aging management program, the final rule will require general licensees to comply with these requirements.

The final rule changes to 10 CFR 72.42(a) and 72.240(c) will provide consistent program activities performed by specific and general license ISFSI installations during the period of extended operation.

3. IDENTIFICATION OF ALTERNATIVE APPROACHES

The NRC considered two alternatives for the final rule, described below.

3.1 *Alternative 1: No-Action*

The No-Action alternative is to maintain the status quo. Under the No-Action alternative, the Commission would make no changes to the current regulations and, as a result, there would be no incremental costs or benefits. This is the baseline of the Regulatory Analysis.

3.2 *Alternative 2: Implement the Regulations in the Final Rule*

This alternative would amend the regulations as described in Sections 2.1 through 2.5 to implement the final rule. Appendix 2 of this Regulatory Analysis shows the input assumptions for Alternative 2.

4. ANALYSIS OF VALUES AND IMPACTS

This section examines the values (benefits) and impacts (costs) expected to result from the NRC's final rule. The benefits and costs are analyzed for Alternative 2 and are broken out by societal attributes considered important to evaluate a final rule. Because the benefits would exceed the costs, the overall impact of this final rule will be a net savings to both licensees and to the NRC.

Table 4-1 lists the attributes significant for this final rule with reference to their expected change. The benefits and costs for each attribute are quantified using a methodology described in Section 4.1. The attributes not expected to be affected by the final rule are listed below Table 4-1. All of these attributes are recommended for consideration during a rulemaking effort, in the Regulatory Analysis Technical Evaluation Handbook [Reference 2].

Table 4-1: Listing of Societal Attributes that Will Be Affected by the Final Rule

Attribute	Expected Change
<i>Industry Implementation</i>	Part 72 licensees and CoC holders will realize one-time costs and savings associated with specific sections of rule text in Alternative 2.
<i>Industry Operation</i>	Part 72 general licensees will realize annual savings associated with the amendment in section 72.212(b)(4) in Alternative 2.

<i>NRC Implementation</i>	The NRC will achieve one-time savings associated with the review of fewer license renewal applications by Part 72 specific licensees and CoC holders in Alternative 2. NRC will realize a one-time cost for the development of regulatory guidance.
<i>NRC Operation</i>	The NRC will realize annual savings associated with fewer exemption requests submitted in amended Section 72.212(b)(4) in Alternative 2.
<i>Regulatory Efficiency</i>	Licensees, CoC holders and the NRC will realize overall improved efficiencies as estimated in the total savings for the four attributes above.

The following attributes are not expected to be affected by the final rule

<i>Public Health (Accident)</i>	<i>Offsite Property</i>	<i>Occupational Health (Accident)</i>
<i>Public Health (Routine)</i>	<i>Onsite Property</i>	<i>Occupational Health (Routine)</i>
<i>Antitrust Considerations</i>	<i>General Public</i>	<i>Safeguards and Security</i>
<i>Environmental Considerations</i>	<i>Other Government</i>	<i>Other Considerations</i>
<i>Improvements in Knowledge</i>		

Section 5 presents the results, in constant 2008 dollars. The results are shown for the one-time costs and savings and annual costs and savings that result from implementation of Alternative 2. The total costs and savings over the 40 year implementation period are estimated using 7 percent and 3 percent real discount rates. This final rule will result in a reduction in costs, so there will be net savings to both licensees and to the NRC.

The estimated total savings for Alternative 2 compared to Alternative 1 are \$1.3 million or \$0.9 million, discounted at 3 percent or 7 percent, respectively, over the 40 year analysis period.

4.1 Analytical Methodology

This section describes the process used to evaluate values and impacts of the affected attributes for Alternative 2. Values (benefits) include any desirable changes. Impacts (costs) include any undesirable changes in affected attributes, such as increased costs. The following attributes have quantifiable values and impacts due to implementation of the final rule:

- Industry Implementation
- Industry Operation
- NRC Implementation
- NRC Operations

The NRC collected input assumptions from referenced sources when these were available. In some cases, the NRC was not aware of any input data and in these cases the NRC staff made an estimate based on best professional judgment. As part of the proposed rule, the NRC sought public comments on the accuracy of the input assumptions used in this regulatory analysis, and on the validity of the method to estimate values and impacts of the rule. The NRC did not receive any comments that addressed the regulatory analysis.

4.1.1 General Assumptions

The general input assumptions for the analysis are discussed below.

- NRC wage rate: \$100/hour. This is NRC's incremental labor rate, which includes only the variable costs associated with implementation and operation costs of the rule.
- Industry wage rate: \$100/hour for licensee management and for administrative support. This represents a blended rate for executive level and administrative personnel who support regulatory compliance of a company operating under NRC regulations.
- The time period for the analysis is 40 years. This is considered a reasonable range of time to evaluate the values and impacts of an increased term because initial and renewal terms of ISFSI licenses and CoCs would increase from 20 years to 40 years.

4.1.2 Specific Assumptions for Alternative 2

Under Alternative 2, the NRC will amend its regulations to implement the final rule. The specific assumptions for Alternative 2 are:

- For the purposes of modeling the costs and savings associated with the final rule, the analysis assumes the rule will be implemented in 2010.
- With regard to 10 CFR 72.42(a) and (b), it is assumed that two of the 13 power reactor sites that had not, as of November 2009, announced their intentions with respect to an ISFSI license, would apply for a Part 72 specific license for a period not to exceed 40 years. Under current regulations, these licensees would need to submit an initial application for 20 years and a renewal application for another 20 years to match the 40 year period in the initial application that will be allowed under amended 10 CFR 72.42(a). The licensee's labor saving in not submitting a renewal application is estimated to be 160 hours. This is a one-time savings. Also, it is assumed that 12 of the current 15 licensees with a Part 72 specific license will apply for a license renewal for a period not to exceed 40 years. These licensees would also save an estimated 160 hours each as a result of submitting only a single license renewal to cover the 40 year analysis period. These are modeled as one-time efforts for each licensee, in constant 2008 dollars.
- With regard to 10 CFR 72.212(a)(3), there are 39 licensees who, as of November 2009, held a Part 72 general license, and there are an estimated 29 new general licensees over the analysis period. It is assumed that the CoC is renewed by the CoC holder for each cask design used by all 39 current licensees and by all 29 new general licensees. There is no additional labor effort on the part of the general licensee to comply with new Section 72.212(a)(3) compared to the No Action alternative (Alternative 1). The only change in labor is due to the frequency in which the CoC holder applies for a CoC renewal, and this labor saving is modeled in 10 CFR 72.240(a).
- With regard to 10 CFR 72.212(b)(4), the same number of licensees is assumed as in Section 72.212(a)(3). Therefore, the analysis models the labor cost of 39 current general licensees and 29 new general licensees during the 40 year analysis period. Additional one-

time reporting is required under amended Section 72.212(b)(4) for these licensees. It is assumed that the 39 current general licensees each have five cask designs for which information will need to be reported in a registration letter, and it would require 4 hours to report the information for each cask design. For the 29 new general licensees, the analysis assumes an average of two cask designs for each. Fewer cask designs were assumed for the new licensees because they would have fewer casks on site compared to the current general licensees. It was also assumed that it will take the same amount of time, 4 hours, to report information in the registration letter. The labor effort to submit these registration letters is modeled as a one-time expense, in 2008 dollars, occurring during the 40 year analysis period.

Also modeled under 10 CFR 72.212(b)(4) is a savings associated with Part 72 general licensees who will no longer be required to submit an exemption request to the NRC to apply changes authorized by an amended CoC to a cask loaded under the initial CoC or an earlier amended CoC. These savings are modeled as annual recurring labor savings. The assumption is that the 39 current general licensees each would submit such an exemption request once every 10 years, or 0.1 on an annual basis. The labor effort on the part of the licensee to submit the exemption request was assumed to be 40 hours per request. For the 29 new general licensees, the analysis assumes the same frequency of exemption requests, equal to once every 10 years, or 0.1 on an annual basis. The labor effort avoided for these new general licensees was assumed to be 16 hours per request, lower than current general licensees because the new licensees would have fewer cask types on site.

- With regard to 10 CFR 72.212(b)(5)-(7), the same number of licensees is assumed as in Section 72.212(b)(4). Under Alternative 2, each of these will have an additional one-time reporting requirement of the documentation and results supporting written evaluations of specific cask design characteristics prior to the licensee's use of the cask under the new 40 year renewal term. This must be performed for each of the cask designs for which a renewal registration letter is being submitted. To perform and document the written evaluations in the renewal application, the analysis assumes 40 hours by each of the 39 current general licensees for each of their five cask designs, and a labor effort of 8 hours by each of the 29 new general licensees for each of their two cask designs. As noted above, the labor effort is less for the new licensees because they will have fewer cask types on site.
- With regard to 10 CFR 72.236(g), the analysis assumes no incremental costs or savings to CoC holders to design their casks to last for the longer term (i.e., a term not to exceed 40 years as opposed to the current 20 year term).
- With regard to the changes in 10 CFR 72.240(a), the following five companies are the holders of CoCs: General Nuclear Systems, Transnuclear, BNG Fuel Solutions, Holtec International, and Nuclear Assurance Corporation. An estimate is made that these holders apply for the renewal of 15 CoCs, not to exceed 40 years, for a cask design and that during the 40 year analysis period holders of an additional 10 CoCs of not yet approved cask designs apply for the extended term renewal. Thus, the holders of a total of 25 CoCs apply only once for term renewal under the final rule instead of twice as would occur under the alternative No Action. It is assumed that the labor savings is 160 hours for each of the renewals that are not required to be submitted.
- With regard to the changes to 10 CFR 72.240(c), the analysis assumes that the one-time labor effort for the aging analyses requires 40 hours for each for the 25 CoCs held by companies who apply for term renewal.

- For NRC costs, an estimate of \$50,000 is made to prepare a guidance document to implement the changes in this rule. Additional annual costs to review Part 72 licensee and CoC holder applications are not modeled because it is assumed these are offset by the savings in not reviewing exemption requests.
- For NRC savings, the analysis assumes that each of the 15 specific licensees will apply only once for license renewal over the 40 year analysis period, instead of twice, for a savings to the NRC staff of 200 labor hours. This is consistent with the site specific licensee costs modeled under 10 CFR 72.42(a), and is modeled as a one-time labor saving. The analysis also assumed that there will be labor savings due to the holders of 25 CoCs applying only once for license renewal instead of twice over the 40 year analysis period, for a one-time labor saving of 200 hours per application. Annual savings to the NRC will occur due to fewer exemption requests being submitted by Part 72 general licensees to allow the licensee to apply CoC amendment changes to a previously loaded cask. The NRC's labor saving is modeled with the same input assumptions as the savings for the Part 72 general licensee under Section 72.212(b)(4).

5. RESULTS

This section presents results of values and impacts that are expected to be derived from the final rule. The results are shown for each of the following four attributes:

- Industry Implementation
- Industry Operation
- NRC Implementation
- NRC Operation

The final rule is expected to provide values in other attributes, such as improvements in regulatory efficiency and improvements in general public confidence, but these are not quantified because they are expected to be small. The quantified values are presented in constant 2008 dollars, for both one-time and recurring annual efforts. The impact of the final rule over a 40 year analysis period is estimated using 3 percent and 7 percent real discount rates to show an overall net effect in terms of 2008 dollars. Alternative 1, the No-Action Alternative, provides a baseline against which the other alternative is assessed.

5.1 Summary of Results

Table 5-1 presents the net impact of the rule. A positive value below is a cost. A number in parentheses is a negative cost, or a savings.

Table 5-1: Net Impact of Alternatives 1 and 2

Regulatory Alternative	40 year total at 3% discount rate (\$ 000)	40 year total 7% discount rate (\$ 000)
1. No Action	0	0

2. Implement the final rule	(1,282)	(886)
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There are no costs or benefits associated with Alternative 1, the No Action alternative. No changes would be made to the regulation. The Part 72 licensees and CoC holders would continue to operate under existing terms for ISFSI and cask renewals, and the NRC would review and approve the applications based on the 20 year term length, with a 40 year term approved for individual exceptions to the regulation.

The major contributing savings under Alternative 2 are due to:

- A total of about \$468,000 in savings, in 2008 dollars at 3 percent discount rate over a 40 year analysis period, is due to amending Section 72.212(b)(4) to allow Part 72 general licensees to apply the changes in an amended CoC to a cask loaded under the initial CoC or an earlier amended CoC. This savings is offset by an estimated one-time cost of about \$100,000 in new reporting requirements associated with a registration letter to apply the changes authorized by an earlier amended CoC, and a one-time cost of about \$826,000 to perform the written evaluations prior to applying for the changes noted above.
- One-time savings of about \$225,000 will be realized by Part 72 specific licensees due to fewer license amendment submittals over the 40 year analysis period.
- One-time savings of about \$400,000 will be realized by CoC holders due to the need to apply for fewer license renewals, but this is offset by an estimated one-time cost of \$100,000 associated with the preparation of an aging analysis in the SAR for the period of extended operation for the cask design.
- Industry and the NRC will realize a total of \$1.3 million in savings at 3 percent discount rate over the 40 year analysis period. This is due to \$300,000 in savings due to the submittal of fewer Part 72 specific license renewal applications, \$500,000 in savings due to fewer CoC license renewal applications, and about \$467,000 in savings due to the submittal of fewer exemption requests from Part 72 general licensees.

Table 5-2 shows the estimated costs, by attribute, over the 40 year analysis period.

Table 5-2: Estimated Values and Impacts by Attribute

Attribute	Alternative 2 40 Year Total Cost (\$ 000)	
	3% Discount	7% Discount
Industry Implementation	404	404
Industry Operation	(468)	(270)
NRC Implementation	(750)	(750)
NRC Operation	(468)	(270)
Total	(1,282)	(886)

Note: Total may differ from sum of values due to rounding.

Table 5-3 shows the NRC final rule amendments and whether or not the amendment is estimated as a cost to industry and to regulators, or is insignificant and not included in the cost-benefit calculations. The line item input assumptions and results are shown in Appendix 2 for those amendments modeled as a cost to industry and to regulators.

Table 5-3: Final Rule Amendments and Significance in the Cost-Benefit Analysis

10 CFR Part 72 amendment description		Cost of amendment estimated as a licensee and/or NRC cost and included in cost-benefit analysis	Cost of amendment NOT estimated as a licensee and/or NRC cost and NOT included in cost-benefit analysis
72.3	Definitions.		X
72.24(c)	Requires a description of the design of the ISFSI or MRS to support the findings in 10 CFR 72.40 for the term requested in the application.		X
72.42(a)-(b)	Requires the licensee to specify in its Part 72 specific license application a fixed period of time, not to exceed 40 years from the date of issuance, for both initial and renewal applications, including aging analyses, current design basis information, and a description of the aging management program. Also requires applications filed consistent with subpart B at least 2 years before expiration of current license, with design bases information.	X	
72.212(a)(3)	Specifies that a Part 72 general license for each cask terminates at the end of the initial term based on cask loading date, and allows the general licensee to apply for a cask term renewal based on the CoC term for a cask design that it uses under its general license, pursuant to new 10 CFR 72.240(a).	X	
72.212(b)(1) - (3)	Existing notification, registration and conformance requirements for the Part 72 general license. The analysis does not estimate the additional cost to general licensees to submit the amendment number		X

	with the existing notification, because the incremental cost is insignificant.		
72.212(b)(4)	Specifies information that the Part 72 general licensee must submit in its registration letter after applying changes authorized by an amended CoC.	X	
72.212(b)(5) – (7)	Requires the Part 72 general licensee to perform written evaluations of three specifications prior to the cask's use and prior to applying changes authorized by an amended CoC to a cask loaded under the initial CoC or an earlier amended CoC, and to review the adequacy of site parameters in the SAR and SER of a CoC, and any changes to written evaluations.	X	
72.212(b)(8) – (10)	Existing requirements of Part 72 general licensees.		X
72.212(b)(11)	Requires a general licensee to maintain a copy of the amended CoC for those casks to which the licensee has applied the changes of an amended CoC and documents referenced in the amended certificate for each cask used for storage of spent fuel. Previously this section applied only to CoCs, and not amended CoCs. The analysis does not estimate the additional cost to general licensees to maintain this record because the incremental cost is insignificant.		X
72.212(b)(12) – (14)	Existing requirements of Part 72 general licensees.		
72.212(e)	Existing requirement specifying fee schedule.		X
72.230(b)	Specifies that casks certified for transportation of spent fuel may be approved for storage of spent fuel for a term not to exceed 40 years. A copy of the CoC, a SAR, and other information must be included in the application.		X
72.234(d)(2)(vii)	Re-designates 72.236(j) to 72.236(k)		X
72.236(g)	Requires CoC holders and applicants to design the cask to store the spent fuel safely for a term proposed in the application, and to permit maintenance as required.		X
72.238	Specifies that the NRC would issue a CoC for a cask model for a term not to exceed 40 years.	X	
72.240(a)	Allows a CoC holder to apply for spent fuel storage cask renewal for a term up to 40 years, and allows a Part 72 general licensee who uses a specific cask model to apply for renewal of that cask CoC if the certificate holder does not apply for renewal.	X	
72.240(c)	Requires in the renewal application a SAR including aging analyses for the cask structures, systems and components for the period of extended operation.	X	

6. DECISION RATIONALE AND IMPLEMENTATION

The assessment of costs and benefits discussed previously provides a sound basis for decision-making that leads the NRC to the conclusion that the final rule, if implemented, will result in net savings to industry and to the NRC due to improved efficiency of managing the terms for ISFSI licenses and for approved storage cask designs. The assessment provides a disclosure of information supporting the conclusion and an alternate approach to the regulatory objectives.

Two alternatives were evaluated in this Regulatory Analysis. Alternative 1 would take No Action and would maintain the regulations as currently written.

Alternative 2 will amend NRC regulations to allow a longer period for the term associated with a site-specific ISFSI, an ISFSI operating under a general license, and the storage cask in use at the site. The term will be extended from the current 20 year time period to a time period specified in an initial license application or a renewal license application, not to exceed 40 years. These changes will improve licensee and NRC management of relevant term expiration dates, at an estimated total savings of about \$1.3 million over a 40 year period at a 3 percent discount rate. The NRC will realize most of the savings, with licensees and CoC holders netting about \$64,000 in savings primarily due to the submittal of fewer license and CoC renewal applications as a result of the increase in term length from 20 years to 40 years. Alternative 2 is the approach taken in the final rule.

The final rule is planned for publication in the *Federal Register* in 2010.

7. REFERENCES

- (1) Staff Requirements Memorandum dated November 29, 2004 [ML043500192], in response to SECY-04-0175 dated September 28, 2004, "Options for Addressing the Surry Independent Fuel Storage Installation License – Renewal Period Exemption Request" [ML010670073].
- (2) Nuclear Regulatory Commission, "Regulatory Analysis Technical Evaluation Handbook, Final Report," NUREG/BR-0184, January 1997.

Appendix 1: Approved Storage Cask and ISFSI Number and Location Information

As of November 2009

Approved Storage Casks in 10 CFR 72.214 Currently In Use

Certificate Number: 1000. General Nuclear Systems, Inc.
Model Number: CASTOR V/21

Certificate Number: 1002. Nuclear Assurance Corporation
Model Number: NAC S/T

Certificate Number: 1003. Nuclear Assurance Corporation
Model Number: NAC-C28 S/T

Certificate Number: 1004. Transnuclear, Inc
Amendments Numbers 1 - 9.
Model Number: NUHOMS®-24P, -52B, -61BT, -32PT, -24PHB, and -24PTH.

Certificate Number: 1005. Transnuclear, Inc.
Model Number: TN-24.

Certificate Number: 1007. BNG Fuel Solutions Corporation.
Amendments Numbers 1 – 6.
Model Number: VSC-24.

Certificate Number: 1008. Holtec International.
Amendments Numbers 1 – 2.
Model Number: HI-STAR 100.

Certificate Number: 1014. Holtec International.
Amendments Numbers 1 – 5.
Model Number: HI-STORM 100.

Certificate Number: 1015. NAC International, Inc.
Amendments Numbers 1 – 4.
Model Number: NAC-UMS.

Certificate Number: 1021. Transnuclear, Inc.
Amendment Number 1.
Model Number: TN-32, TN-32A, TN-32B

Certificate Number: 1025. NAC International, Inc.
Amendments Numbers 1 – 5.
Model Number: NAC-MPC.

Certificate Number: 1026. BNG Fuel Solutions Corporation.
Amendments Numbers 1 – 4.
Model Number: WSNF-220, WSNF-221, and WSNF-223 systems; W-150 storage cask; W-100 transfer cask; and the W-21 and W-74 canisters.

Certificate Number: 1027. Transnuclear, Inc.
Amendment Number 1.
Model Number: TN-68.

Certificate Number: 1029. Transnuclear, Inc.
Amendment Number 1.
Model Number: Standardized Advanced NUHOMS®-24PT1, NUHOMS®-24PT4.

Certificate Number: 1030. Transnuclear, Inc.
Model Number: NUHOMS® HD-32PTH

Certificate Number: 1031. NAC International, Inc.
Model Number: MAGNASTOR.

ISFSI site specific licenses

1. GE Morris (wet)
2. Surry
3. H. B. Robinson
4. Oconee
5. Fort St. Vrain
6. Calvert Cliffs
7. Prairie Island
8. North Anna
9. TMI-2 Debris
10. Trojan
11. Rancho Seco
12. Diablo Canyon
13. Idaho Spent Fuel Facility
14. Humboldt Bay
15. Private Fuel Storage

Planned ISFSI site (added for final rule)

1. Salem

ISFSI general licenses

1. Maine Yankee
2. Vermont Yankee
3. Yankee Rowe
4. Haddam Neck
5. Millstone
6. Indian Point
7. Susquehanna
8. Peach Bottom
9. Oyster Creek
10. Hope Creek /Salem
11. North Anna*
12. Surry*
13. McGuire
14. Catawba
15. Robinson*
16. Oconee*
17. Sequoyah
18. Hatch
19. Farley
20. St. Lucie
21. Browns Ferry
22. River Bend
23. Grand Gulf
24. Arkansas Nuclear One
25. Calhoun
26. Dresden
27. Duane Arnold
28. Quad Cities
29. Columbia
30. Palo Verde
31. San Onofre
32. Davis Besse
33. Palisades
34. Big Rock Point
35. Point Beach
36. FitzPatrick
37. Seabrook

Licensees Pursuing a General License

1. Ginna
2. Braidwood
3. Brunswick
4. LaSalle
5. Byron
6. Cooper
7. LaCrosse
8. Turkey Point
9. Cooper
10. Kewaunee
11. Comanche Peak
12. Perry
13. Fermi
14. Cook
15. Crystal River
16. Waterford

Sites with No Announced Intentions

1. Pilgrim
2. Three Mile Island
3. Clinton
4. Callaway
5. Wolf Creek
6. South Texas Project
7. Shearon Harris
8. Summer
9. Vogtle
10. Zion
11. Beaver Valley
12. Watts Bar
13. Nine Mile Point

38. Monticello
39. Limerick

*also site specific licensees

Appendix 2: Input Assumptions and Line Item Results for Alternative 2

Licensee Costs and Savings

	Description	No. of NRC Licensees or CoC Holders	No. of cask designs per NRC Licensee or CoC Holder	Hours per Licensee or CoC Holder	Wage Rate (\$/hr)	One-time Cost or Savings	Annual Cost or Savings	Total 40 Yr 3% NPV	Total 40 Yr 7% NPV
Part 72									
72.42(a) and (b)	Requires the licensee to specify in its application for a specific license a fixed period of time for a Part 72 specific license, not to exceed 40 years from the date of issuance, including aging analyses and an aging management program: --- initial applications.	2	-	-160	100	-\$32,000	-	-	-
	--- renewals.	12	-	-160	100	-\$192,000	-	-	-
72.212(a)(3)	Specifies that a Part 72 general license for each cask fabricated under a CoC terminates when the CoC for that particular cask design expires: --- current general licensees.	39	-	0					
	--- future general licensees.	29	-	0					
72.212(b)(4)	Specifies information that the Part 72 general licensee must submit in its registration letter after applying changes authorized by an amended CoC: --- current general licensees.	39	5	4	100	\$78,000	-	-	-
	--- future general licensees.	29	2	4	100	\$23,200	-	-	-
	Allows changes authorized by an amended CoC to a cask loaded under the initial CoC or an earlier amended CoC: --- current general licensees.	39	0.1	-40	100		-\$15,600	-\$360,590	-\$207,975
	--- future general licensees.	29	0.1	-16	100		-\$4,640	-\$107,253	-\$61,859
72.212(b)(5)-(7)	Requires the Part 72 general licensee to perform written evaluations of three specifications prior to its use and prior to applying changes authorized by an amended CoC to a cask loaded under the initial CoC or an earlier amended CoC, and to review the adequacy of site parameters in the SAR and SER of a CoC, and any changes to written evaluations: --- current general licensees.	39	5	40	100	\$780,000	-	-	-
	--- future general licensees.	29	2	8	100	\$46,400			
72.240(a)	Allows a CoC holder to apply for spent fuel storage cask renewal for a term not to exceed 40 years,	25	1	-160	100	-\$400,000	-	-	-
72.240(c)	Requires aging analyses in the Safety Analysis Report for the period of extended operation requested by: --- the CoC holder.	25	1	40	100	\$100,000	-	-	-
SUBTOTAL								-\$467,843	-\$269,834
+ one-time costs								\$403,600	\$403,600
TOTAL								-\$64,243	\$133,766

Appendix 2 continued

NRC Costs and Savings

10 CFR	Description	No. of CoC Applications (one time) or number of general licensees	No. of cask designs, or number of exemption requests per year	NRC Review Hours per Application or Exemption	Wage Rate (\$/hr)	One-time Cost or Savings	Annual Cost or Savings	Total 40 Year 3% NPV	Total 40 Year 7% NPV
Part 72									
72.42(a)	Allows NRC review of site specific license application under 40 year term instead of 20 year term.	15		-200	100	-\$300,000			
72.212(b)(4)	Allows a general licensee to apply CoC amendment changes to a previously loaded cask --- current general licensees	39	0.1	-40	100		-\$15,600	-\$360,590	-\$207,975
	--- future general licensees.	29	0.1	-16	100		-\$4,640	-\$107,253	-\$61,859
72.238	Allows NRC to issue a CoC for a cask model for a term not to exceed 40 years, instead of a term of 20 years.	25	1	-200	100	-\$500,000			
	Cost to develop final rule and guidance document.					\$50,000			
SUBTOTAL								-\$467,843	-\$269,834
+ one-time costs								-\$750,000	-\$750,000
TOTAL								-\$1,217,843	-\$1,019,834