



NUCLEAR ENERGY INSTITUTE

9/21/2012
77 FR 58591

Ralph L. Andersen, CHP
SENIOR DIRECTOR
RADIATION SAFETY & ENVIRONMENT PROTECTION
NUCLEAR GENERATION DIVISION

November 15, 2012

3

Ms. Cindy K. Bladey
Chief, Rules, Announcements, and Directives Branch
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RECEIVED

2012 NOV 15 PM 1:49

RULES AND DIRECTIVES
BRANCH
USNRC

Subject: Comments on Revision 15 of NUREG-1307, "Report on Waste Burial Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities" (Docket ID: NRC-2010-0362)

Project Number: 689

Dear Ms. Bladey:

This letter provides the comments of the Nuclear Energy Institute (NEI)¹ on Revision 15 to NUREG-1307, which is intended for use by licensees to estimate low-level radioactive waste (LLRW) disposal costs associated with nuclear power reactor decommissioning. Revision 15 was noticed for a 30-day public comment period on Sept. 21, 2012.² In a letter dated Sept. 26, 2012, NEI requested that the public comment period be extended to 90 days.³ The NRC granted NEI's request in part, extending the public comment period to 55 days.⁴

¹ NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, nuclear material licensees, and other organizations and individuals involved in the nuclear energy industry.

² 77 Fed. Reg. 58,591 (Sept. 21, 2012).

³ Letter from R. Andersen (NEI) to C. Bladey (NRC), "Request for Extension of the Public Comment Period on Revision 15 of NUREG-1307, 'Report on Waste Burial Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities,' Sept. 26, 2012, (Docket ID: NRC-2010-0362)."

⁴ 77 Fed. Reg. 64,361 (Oct. 19, 2012).

SONS+ Review Complete

GRIDS = ADM-03
add - J. A. Simpson

(JAS15)

Template = ADM-013

NEI's detailed comments on Revision 15 are included in Attachments 1, 2 and 3 to this letter. Attachments 4 and 5 include copies of industry and NRC staff presentations from the Nov. 7, 2012, public meeting that is referenced in our detailed comments. As explained in the attachments, NEI has serious concerns regarding both the substance of Revision 15 and, more generally, the process used to develop and incorporate changes to NUREG-1307. First, the proposed changes to the vendor disposal option contained in Revision 15 are based on the incorrect assumption that large volumes of Class A LLRW—which are clearly destined for the disposal facility in Clive, Utah—will instead be disposed of at a facility priced like the Barnwell facility in South Carolina. The examples provided in Revision 15 reveal that this unsupported and incorrect assumption would significantly increase the NRC's minimum formula amount⁵ applicable to reactor licensees.

Further, this significant change to NUREG-1307 was undertaken with a minimal process for obtaining formal input from industry or other stakeholders. Revision 15 was originally published for only a 30-day comment period, although the NRC did extend that period to 55 days at NEI's request. Despite the fact that the NRC is now in the process of revising NUREG-1307 for the fifteenth time, this is the first time that public comment has been solicited on the document. Further, no Regulatory Analysis was performed prior to issuing Revision 15. Given the potential financial impact of the changes contained in Revision 15, the lack of any Regulatory Analysis is particularly striking. If finalized in its current form and used by reactor licensees to update decommissioning minimums (consistent with past practice), the financial impact on the nuclear power industry would be substantial. Such impact is unsupported and unjustified by the data contained in the current revision of NUREG-1307.

Given the substantive and procedural deficiencies described above, we urge the NRC to not adopt this revision and instead to continue to rely on Revision 14 of the document until an adequately transparent process is developed and implemented to update the NUREG.⁶ In the event that the NRC decides to finalize Revision 15 by Dec. 31, 2012, NEI supports the use of a 95%/5% ratio based on LLRW classification categories as a replacement for what has traditionally been known as the "Vendor Disposal Option." This latter option is described in more detail in Attachment 3.

NEI's detailed comments are provided in the five attachments to this letter:

- Attachment 1: Introduction and Background

⁵ The NRC's minimum formula amount (10 C.F.R. § 50.75(c)) is used as one step in the overall regulatory process in providing decommissioning funding assurance. It is not intended to be a "substitution for...other requirements...and [is] not intended to be used by [itself] or by other agencies to establish rates." 10 C.F.R. § 50.75(a).

⁶ Although we believe that reliance on Revision 14 is a preferable short-term alternative to the changes proposed in Draft Revision 15, this should not be interpreted as a wholesale endorsement of Revision 14. As explained above, this is the first time comments have been solicited on NUREG-1307. Industry was appropriately focused on Revision 15 during the 55 day comment period provided. We qualify our statements regarding Revision 14 because – as explained in Enclosure 3 – we believe that a 95%/5% ratio, which tracks with waste classification, is appropriate. Revision 14 utilized an 85%/15% ratio, and the basis for such a ratio is unclear.

Ms. Cindy K. Bladey

November 15, 2012

Page 3

- Attachment 2: Administrative Processes Used to Issue and Revise NUREG-1307 Have Been Insufficient to Establish It Either as a Rule or as Formal Guidance
- Attachment 3: Changes to the Vendor Disposal Option in Revision 15 are Arbitrary and Capricious
- Attachment 4: "Nuclear Industry Views on Table A-4 of Proposed Revision 15 to NUREG-1307," PowerPoint Presentation, Nov. 7, 2012
- Attachment 5: "NUREG-1307, Rev. 15, Update," PowerPoint Presentation, Nov. 7, 2012

If you have any questions concerning these comments please feel free to contact me or Jerry Bonanno (jxb@nei.org, 202-739-8147).

Sincerely,



Ralph L. Andersen

Attachments

c: Mr. Ho K. Nieh Jr., NRR/DIRS, NRC
Mr. Thomas L. Fredrichs, NRR/DIRS, NRC
Mr. Richard H. Turtill, NRR/DIRS/IFAIB, NRC
Ms. Jo Ann Simpson, NRR/DIRS/IFAIB, NRC
Ms. Anneliese Simmons, NRR/DIRS/IFAIB, NRC

Attachment 1

NEI Comments on Revision 15, NUREG-1307

INTRODUCTION AND BACKGROUND

I. NUREG-1307 and Decommissioning Funding

10 C.F.R. § 50.75 establishes requirements dictating how NRC licensees are to provide reasonable assurance that funds will be available for the decommissioning process.¹ More specifically, power reactor licensees must provide assurance of decommissioning funding in an amount at least equal to the amount yielded by application of the table and formulas in § 50.75(c)(1).² The tables and formulas in § 50.75(c)(1) provide the minimum amounts required to demonstrate reasonable assurance of funds for decommissioning, by reactor type and power level, in 1986 dollars. Because the minimum amount is provided in 1986 dollars, it must be adjusted annually to account for escalating labor, energy, and low-level radioactive waste (LLRW) burial costs.³ The NRC's regulations go on to state that the escalation factor for LLRW burial (B_x) "is to be taken from NRC report NUREG-1307, 'Report on Waste Burial Charges.'"⁴

¹ Providing decommissioning funding assurance is a multi-step effort, which is implemented over the operating life of a plant and continues after plant shutdown. The elements of this multi-step effort include not only the use of the certification formula amount to determine initial decommissioning levels, but also: annual updating of that formula amount; biennial reporting on the status of decommissioning funds; adjustment of funding levels, as necessary; limiting funding assurance mechanisms to those considered appropriate by the NRC; limiting assumptions regarding estimated future growth of funds to a conservative rate of return; submittal of a preliminary decommissioning cost estimate five years prior to shut down; submittal of a site-specific cost estimate within two years of plant shutdown; and prohibiting the use of decommissioning funds for any purpose other than decommissioning. *See* 10 C.F.R. §§ 50.75, 50.82. *See also*, Letter from Hon. A. M. Macfarlane (Chairman, NRC) to Hon. B. Boxer (Chairman, Committee on Environment and Public Works, U.S. Senate), July 11, 2012, at pg. 2. ("The decommissioning funding formula is only one input to the NRC's regulatory system for funding assurance, which includes annual adjustments and accounting for site-specific costs. When these steps are considered as a whole, they provide reasonable assurance that funds will be available when needed.").

² 10 C.F.R. § 50.75(b)(1). This is often referred to as the "minimum formula amount." As the NRC made clear in response to a recent GAO report, the formulas in 10 C.F.R. § 50.75(c) are designed to ensure that the "bulk" of decommissioning funds are set aside or accounted for relatively early in plant life. Specifically, with respect to the credibility and accuracy of the minimum funding formula the NRC stated:

The NRC formula is intended to provide a reference level decommissioning funding amount for use by licensees as a planning tool early in plant life. The formula amount is based on studies of the costs to decommission a reactor, but accuracy is difficult to achieve early in plant life due to the uncertainties of projecting costs decades into the future. In view of this, the NRC disagrees that the reevaluation of the formula should be the method to achieve the goals of credibility and accuracy. The NRC believes those goals should be achieved by requiring the licensee to provide an updated plant-specific cost estimate late in plant life, as found in Title 10 of the *Code of Federal Regulations* Section 50.75(f)(3). At that time, additional decommissioning information will be available to the licensee, which reduces uncertainties to a level that permits reasonable accuracy in cost projections.

Letter from Hon. A. M. Macfarlane (Chairman, NRC) to Hon. B. Boxer (Chairman, Committee on Environment and Public Works, U.S. Senate), July 11, 2012, at pg. 3.

³ 10 C.F.R. § 50.75(b)(2), (c)(2).

Attachment 1

NEI Comments on Revision 15, NUREG-1307

INTRODUCTION AND BACKGROUND

Power reactor licensees are also required to file biennial reports describing the status of decommissioning funding for each reactor. At a minimum, these reports—which are due on March 31 of odd-numbered years—must include:

- The amount of decommissioning funds estimated to be required under 10 C.F.R. § 50.75(b) and (c);
- The amount accumulated to the end of the calendar year preceding the date of the report;
- A schedule of the annual amounts remaining to be collected;
- The assumptions used regarding rates of escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections;
- Any contracts upon which the licensee is relying under § 50.75 (e)(1)(v);
- Any modifications occurring to a licensee's current method of providing financial assurance since the last submitted report; and
- Any material changes to trust agreements.⁵

Historically, the most recent revision of NUREG-1307 is used by licensees when preparing the biennial reports required by § 50.75. Thus, if a revision to NUREG-1307 is finalized by December 31 of an even numbered year, NRC's expectation is that a licensee would use that revision in preparing its biennial report due the following March. Draft Revision 15 to NUREG-1307 was published for a 30-day public comment period on September 21, 2012.⁶ Like recent revisions to the NUREG, Draft Revision 15 provides LLRW escalation factors for two scenarios: (1) "Direct Disposal" and (2) "Direct Disposal with Vendors" (*i.e.*, the vendor disposal option). The most significant and troubling changes in Revision 15 involve the vendor disposal option, the history of which is discussed in greater detail below in Section II. Section III provides a detailed procedural history of Revision 15. NEI's views on the process used to revise NUREG-1307 are provided in Attachment 2, and our substantive comments on the technical deficiencies and potential solutions are included in Attachment 3.

⁴ 10 C.F.R. § 50.75(c)(2).

⁵ 10 C.F.R. § 50.75(f).

⁶ 77 *Fed. Reg.* 58, 591 (Sept. 21, 2012).

Attachment 1

NEI Comments on Revision 15, NUREG-1307

INTRODUCTION AND BACKGROUND

II. Origin and Evolution of the “Vendor Disposal Option”

An option taking account of the growing trend of disposal of LLRW through vendors was added to NUREG-1307 in 1998.⁷ Prior to 1998, LLRW burial costs were estimated using costs for direct disposal at one of the existing LLRW disposal facilities. Revision 8 of NUREG-1307 states:

This update includes the additional LLW disposition option of turning the majority of the LLW generated during decommissioning over to waste vendors for disposition.... It is left to the licensees to determine whether direct disposal or disposition using waste vendors best represents their particular situation.⁸

As explained in Section A.3, “LLW Disposition by Waste Vendors,” of Revision 8, the addition of the vendor option was an attempt to make the cost estimates contained in NUREG-1307 more realistic by recognizing the growing trend among nuclear power licensees of outsourcing LLRW management functions to waste vendors for a negotiated fee (*e.g.*, \$/pound or \$/unit volume). The vendor would then determine the most efficient disposition option for each waste stream. Revision 8 specified that such disposition options could include survey and sorting (*i.e.*, clean vs. contaminated), recycling, volume reduction, and subsequent disposal of residual LLRW at the most cost-effective disposal site. Revision 8 also recognized that it was in the waste vendor’s business interest to effectively manage wastes to reduce the cost of ultimate disposal.⁹

The NRC priced the vendor option in Revision 8 by obtaining quotes for certain waste streams (*i.e.*, activated/contaminated concrete and contaminated metal) from waste vendors, utilizing a voluntary survey to obtain the information. In addition, the NRC made the following assumptions: (1) all dry active waste (DAW) would be contracted by waste vendors at the same price as activated/contaminated concrete, and (2) all liquid radioactive waste and activated metals would be disposed of without further processing—that is, these waste streams would be shipped directly to disposal facilities.¹⁰ So, the cost estimates for the vendor disposal option were derived using vendor pricing for the DAW and activated/contaminated concrete, and pricing for

⁷ NUREG-1307, Rev. 8, “Report on Waste Disposal Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities” (December 1998) (“Rev. 8”).

⁸ Rev. 8, at pg. 2.

⁹ See Rev. 8, at pg. A.2.

¹⁰ Rev. 8, at pg. A.3.

Attachment 1

NEI Comments on Revision 15, NUREG-1307

INTRODUCTION AND BACKGROUND

direct disposal at facilities in South Carolina and Washington for liquid radioactive wastes and activated metals.¹¹

Although the waste vendor disposal option resulted in lower B_x values, the NRC concluded that inclusion of the option was conservative because: (1) “the waste vendor prices used [were] at the upper range of the price quotes provided,” (2) “the waste vendor quotes included packaging and transportation of LLRW, which are already included in the labor and energy cost elements, respectively, of the 10 C.F.R. § 50.75 algorithm,” and (3) “when utilization of waste vendors is more cost effective than direct disposal . . . at least some of the activated metal could be dispositioned more economically through the services of a vendor.”¹²

Apart from adjustments to actual pricing information, it appears that the basic methodology used to estimate the costs associated with the vendor disposal option remained unchanged for over a decade, until issuance of Revision 14 of NUREG-1307 in 2010.¹³

Revision 14 to NUREG-1307 was published in November 2010. In Revision 14, the pricing inputs for estimating the cost of LLRW disposal under the vendor disposal option changed. Instead of utilizing pricing provided by waste vendors, Revision 14 utilizes pricing for disposal of several categories of Class A LLRW at the Clive, Utah facility (*e.g.*, large components, debris, oversized debris, resins/filters, combustibles, evaporator bottoms).¹⁴ Also, Revision 14 states that the pricing information provided for disposal at the Clive facility was applied to 100% of the Class A LLRW volumes.¹⁵ In contrast, as described above, in previous revisions of NUREG-

¹¹ See Rev. 8, at Table B.19 and B.20.

¹² *Id.* at pg. A-3.

¹³ See, *e.g.*, NUREG-1307, Rev. 13, “Report on Waste Disposal Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities” (November 2008)(“Rev. 13”). In Rev. 13, the NRC estimated the cost of the vendor disposal option by utilizing price quotes from three waste vendors for activated/contaminated concrete and contaminated metal. Further, like Rev. 8, the cost analysis in Rev. 13 assumed that disposition of DAW was contracted by waste vendors at the same price as activated/contaminated concrete, and that all liquid radioactive waste and activated metals were disposed of via direct shipment to one of the two existing waste disposal facilities (*i.e.*, South Carolina or Washington). *Id.* at pg. A-3, Tables B.33 – B.64.

¹⁴ NUREG-1307, Rev. 14, “Report on Waste Disposal Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities” (November 2010)(“Rev. 14”), at pg. A.3.

¹⁵ “In support of NUREG-1307, Rev. 14, price quotes to dispose of each of the components of the reference PWR and BWR were obtained for disposal of Class A LLW at the Clive, Utah disposal facility. Unit costs, exclusive of taxes, were provided for several different categories of components, which are listed in Table A.3. These rates assume no volume discounts, which can be substantial. In addition, a tax of 10% was assumed. The rates in Table A.3 were applied to 100% of the Class A LLW volumes.” Rev. 14, at pg. A.3.

Attachment 1

NEI Comments on Revision 15, NUREG-1307

INTRODUCTION AND BACKGROUND

1307 the pricing information provided by LLRW vendors was applied to certain waste streams (e.g., DAW, activated/contaminated concrete), while other waste streams were assumed to be shipped directly to disposal facilities in South Carolina or Washington.¹⁶ Revision 14 also states that “[e]ffective with NUREG-1307, Rev. 14, this option [waste vendor] assumes that 85% of the total LLW volume is dispositioned using waste vendors and the Clive, Utah disposal facility and the remaining 15% is dispositioned via direct disposal at one of the two full-service disposal facilities.” It is unclear whether this represents a change or simply documentation of past practice. Whether it originated with Revision 8 or Revision 14, it is unclear how the 85%/15% assumption was derived and whether it is consistent with the statement that “the rates in Table A.3 were applied to 100% of the Class A LLW volumes.”¹⁷

Revision 14 also contained the following, somewhat cryptic, caution regarding future revisions to NUREG-1307:

[I]nformation received since the waste vendor option was introduced in 1998 suggests the percentage of waste that is actually processed by a waste vendor may be less than 100 percent. The NRC is considering adjusting the waste vendor option to reflect this additional information in the next revision of NUREG-1307, which could result in an increase in the cost estimate for the waste vendor disposal option. Accordingly, given these considerations, licensees may want to set aside additional decommissioning trust funds in order to avoid significant future shortfalls in funding and potential enforcement actions.¹⁸

While suggesting that licensees set aside additional decommissioning funds to “avoid significant future shortfalls” and “potential enforcement actions,” Revision 14 to NUREG-1307 provided no information on how much additional funding may be needed as a result of unspecified future changes to the NUREG; the nature of the information upon which the NRC was relying to

¹⁶ Although Revisions 8 – 13 are fairly clear in describing how the vendor and disposal facility pricing information was applied to certain waste streams, Revision 14 seems to assert that the B_x factors developed for the vendor option in Revision 8 “assumed that 100% of the Class A LLW was dispositioned using waste vendors.” Rev. 14, at pg. A.3. Revisions of the NUREG prior to Revision 14 did not, however, explicitly state or indicate that pricing was applied by waste classification. Instead, as described above, these revisions explained that pricing was applied based on the type of waste stream in question. For example, using comparisons of PWR data from the B series of tables, it appears that the waste vendor option affected 12 of 29 reference components for PWRs, which implies that the waste vendor option was only being applied to a subset of waste streams.

¹⁷ Rev. 14, at pg. A.3.

¹⁸ Rev. 14, at pg. iv.

Attachment 1

NEI Comments on Revision 15, NUREG-1307

INTRODUCTION AND BACKGROUND

support such changes; or the magnitude of the changes to the vendor disposal option being contemplated. Further, prior to the publication of Revision 15, no iteration of NUREG-1307 was ever published for public comment. Suggesting that licensees set aside additional decommissioning funds under threat of enforcement action based on vague references to unspecified changes to a technical NUREG document that may (or may not) occur at some unspecified future date is utterly inconsistent with the Commission's Principles of Good Regulation. Additional detailed comments on the insufficiency of the process used to update NUREG-1307 are provided in Attachment 2.

III. Procedural History of Revision 15 to NUREG-1307

Apart from the vague foreshadowing in Revision 14 discussed above, the first specific information provided by the NRC on Revision 15 to NUREG-1307 came during a presentation at a March 2, 2011, workshop on decommissioning funding.¹⁹ During that presentation, the NRC advised the meeting participants that it was considering adjusting the vendor disposal option such that only 70% of the LLRW would be assumed to be disposed of through a vendor and 30% would be assumed to be shipped directly to a disposal facility (*i.e.*, in either South Carolina or Washington). The NRC also communicated that the change was based upon a review of licensee site-specific cost estimates and actual decommissioning experience, and that they believed this change would align the formula amount with the site-specific cost estimates provided by licensees. The potential impact on the required decommissioning funding minimums was described as between \$50,000,000 and \$70,000,000. Importantly, when asked whether public comment would be solicited on the proposed changes to NUREG-1307, the NRC staff stated that its intent was simply to provide stakeholders notice of the planned changes and the likely impacts on the decommissioning funding minimums, but that the document would not be vetted further prior to being finalized.²⁰

In a letter dated March 8, 2011, NEI communicated several concerns to the Commission regarding the conduct of the March 2, 2011 workshop. Notably, NEI expressed concern that changes to a document like NUREG-1307—which is explicitly referenced in 10 C.F.R. § 50.75 and can significantly affect the minimum amount required to provide reasonable assurance of

¹⁹ Powerpoint Presentation, "Overview of NUREG-1307, Revision 14, Report on Waste Burial Charges," presented by Clayton Pittiglio (NRC) and Steve Short (PNNL), March 2, 2011.

²⁰ See "Official Transcript of Proceedings: Decommissioning Funding Workshop," March 2, 2011 (NRC Work Order No. NRC-742), at pg. 77-78 ("Transcript"). Notably, at several points during the workshop, industry representatives requested the opportunity to interact with the NRC staff on issues related to LLRW disposal. See Transcript, at pgs. 41-42, 53-55, 56-57. No such interactions occurred until a November 7, 2012, public meeting, which was held at industry's request.

Attachment 1

NEI Comments on Revision 15, NUREG-1307

INTRODUCTION AND BACKGROUND

adequate decommissioning funding—would not be published for public comment.²¹ In a Staff Requirements Memorandum dated February 27, 2012, the Commission directed the staff to publish Revision 15 to NUREG-1307 for public comment prior to finalizing the document.²²

Draft Revision 15 to NUREG-1307 was published for a 30-day public comment period on September 21, 2012.²³ The changes to the assumptions regarding the vendor disposal option were even more significant than those discussed in the March 2, 2011, public meeting. In fact, the changes proposed in Revision 15 increase the minimum formula amount by nearly double the amount predicted by the staff in the March 2, 2011 public meeting. Specifically, the examples provided in Revisions 14 and 15 reveal the following increases in the minimum formula amount as a result of changes to the B_x factor for the vendor disposal option:

Reactor Type	Thermal Power Rating	Disposal Option (vendor vs. direct)	Revision 14 Minimum Funding Estimate ²⁴	Revision 15 Minimum Funding Estimate (using Rev. 14 E and L factors and Rev. 15 B _x) ²⁵	Increase in Funding Estimate Due to Changes to B _x in Rev. 15
BWR	3,400 MWth	Vendor	\$612,000,000	\$746,589,150	\$134,589,150
PWR	3,400 MWth	Vendor	\$477,000,000	\$606,985,050	\$129,985,050

²¹ Letter from A.Pietrangelo (NEI) to Hon. G.Jaczkco (NRC), "Concerns Regarding the Conduct of the U.S. Nuclear Regulatory Commission's March 2 Decommissioning Funding Workshop," March 8, 2011.

²² Staff Requirements – SECY-11-0133 – "Options to evaluate Requests to Use Discounted Parent Company Guarantees to Assure Funding of Decommissioning Costs for Power Reactors," Feb. 27, 2012.

²³ 77 *Fed. Reg.* 58, 591 (Sept. 21, 2012).

²⁴ Rev. 14, at pg. 8.

²⁵ See Draft Rev. 15, at pg. 10-11.

Attachment 1

NEI Comments on Revision 15, NUREG-1307

INTRODUCTION AND BACKGROUND

In a letter dated September 26, 2012, NEI requested that the public comment period on Draft Revision 15 be extended from 30 to 90 days.²⁶ In that letter, NEI expressed concern that the waste burial escalation factor contained in Draft Revision 15 may have been based, in part, on a misinterpretation and misapplication of information contained in site-specific decommissioning funding estimates submitted by reactor licensees. Such errors, NEI explained, could result in the unwarranted imposition of significant additional decommissioning funding obligations on reactor licensees. NEI went on to argue that a 90-day public comment period would provide a more sufficient time period for industry stakeholders to fully evaluate the NRC's proposed changes, obtain necessary clarification from the agency, and offer comprehensive input on the assumptions and bases underlying the proposed revisions. Given the complexities involved in estimating decommissioning funding obligations, the significant financial impacts associated with the proposed changes, and the need to adequately understand the bases and assumptions that support Revision 15, NEI believed that a public comment period of 90 days was reasonable and more consistent with comment periods offered on other significant revisions to NRC guidance and proposed rulemakings.

In a letter dated October 5, 2012, the NRC agreed to extend the public comment period on Draft Revision 15 from 30 to 55 days, making written comments due on November 15, 2012.²⁷ In addition, the NRC's October 5, 2012, letter stated that "the NRC held a workshop on March 2, 2011, in Rockville, MD, to actively seek stakeholder input on power reactor decommissioning issues and to obtain comments on the waste vendor disposal option." NEI disagrees with this characterization of the March 2, 2011, public meeting. As discussed above, the NRC staff clearly communicated that the purpose of the March 2 presentation on the proposed revisions to NUREG-1307 was *not* to solicit public comment. Rather, the NRC staff stated that the purpose of the presentation was to provide notice to stakeholders that the document would be modified and that the modifications would result in a significant increase in the minimum amount required to demonstrate reasonable assurance of adequate decommissioning funding. The *Federal Register* notice published on September 21, 2012, provided the first opportunity for public comment on this or any of the previous 14 versions to NUREG-1307.

The NRC's October 5, 2012, letter extending the comment period from 30 to 55 days also explains that the NRC staff would greatly benefit from additional waste burial data, including:

²⁶ Letter from R.Andersen (NEI) to C.Bladey (NRC), "Request for Extension of the Public Comment Period on Revision 15 of NUREG-1307, 'Report on Waste Burial Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities' (Docket ID: NRC-2010-0362)," Sept. 26, 2012.

²⁷ Letter from H.Nieh (NRC) to R.Andersen (NEI), October 5, 2012.

Attachment 1

NEI Comments on Revision 15, NUREG-1307

INTRODUCTION AND BACKGROUND

- (1) Actual disposal costs including, but not limited to, waste management and disposal costs, under proprietary cover, if necessary;
- (2) Disposal costs specific to disposal operations for Rancho [Seco] and ZionSolutions, under proprietary cover, if necessary;
- (3) Identification of misinterpreted or misapplied data, if any, found in Table A-4 of NUREG-1307, Rev.15; and
- (4) Licensees' site-specific cost estimates and timing assumptions.²⁸

NEI's comments on the substance of Revision 15 to NUREG-1307 are primarily focused on identifying and explaining the problems associated with the information contained in Table A-4 and potential solutions to those problems, which would result in a B_x factor that more accurately reflects current LLRW burial costs. NEI believes that the problems associated with Table A-4 are the most significant and substantive deficiencies in Revision 15, and given the relatively short comment period provided, our comments appropriately focus on this area. NEI and the industry are, however, very interested in the development of an expanded, public process for revising and updating the LLRW cost estimates provided in NUREG-1307. As acknowledged in the NRC's October 5 letter, some information relevant to updating generic LLRW cost estimates may be commercially sensitive (*i.e.*, proprietary) and voluntary disclosure of such information to the agency will need to be carefully planned and well understood by those providing the information. For example, multiple interactions between the NRC staff and the relevant industry stakeholders will likely be necessary in order to come to agreement on the need for such information, how the information will be used, and how to properly scope the disclosures. Although NEI could assist in facilitating such voluntary disclosures by its member companies and others, ultimately, agreement to provide such information would need to be obtained from individual NEI member companies, as well as any other companies that have a commercial interest in the information (*e.g.*, companies providing waste disposal or processing services). Thus, much of the information mentioned in the NRC's October letter is not being provided with these comments.²⁹

²⁸ *Id.*, at pg. 2.

²⁹ We also note that based on the brief description provided in the NRC's October letter, NEI does not believe that it possesses such commercially sensitive information.

Attachment 2

NEI Comments on Revision 15, NUREG-1307

ADMINISTRATIVE PROCESSES USED TO ISSUE AND REVISE NUREG-1307 HAVE BEEN INSUFFICIENT TO ESTABLISH IT EITHER AS A RULE OR FORMAL GUIDANCE

I. NRC Licensees Are Not Required to Use Any Version of NUREG-1307 Because the Process Used to Revise NUREG-1307 Does Not Comply with the Administrative Procedure Act or the NRC's Own Procedures for Developing Agency Guidance.

As discussed below, no administrative process has been followed with respect to the issuance and application of NUREG-1307, including its revisions, that would confer the status of a rule, or even NRC guidance on the document. Despite a general citation to the document in the decommissioning regulations, neither the original version nor any of the subsequent revisions have been issued in a fashion that complies with the Administrative Procedure Act (APA) provisions governing the issuance of binding regulations, or NRC processes for imposing generic rules or guidance, which would be required to confer some official regulatory status on the document. As demonstrated below, these deficiencies lead to the conclusion that irrespective of licensees' prior application of the previous revisions of this document—for purposes of calculating the NRC formula amount for minimum decommissioning certification—the report is fundamentally no more than an advisory document.

A. Non-Conformance to the Administrative Procedure Act Rulemaking Provisions

1. Failure to Afford Notice and Comment on NUREG-1307 or Its Revisions

Although 10 C.F.R. § 50.75(c)(2) references NUREG-1307, no document or revision thereto has ever been issued in compliance with the APA's rulemaking requirements. In fact, a final version of NUREG-1307 did not exist prior to promulgation of the final rule.¹ NUREG-1307 itself states that the approaches and methods described in it are “not a substitute for NRC regulations” and “are provided for information only.”² Thus, while the NRC's own statements appear to acknowledge that the document is not legally binding on licensees, the history of its application, beginning with its inclusion in the text of the decommissioning rule, suggest that the NRC may

¹ A draft NUREG appears to have been available when the final rule was issued. Regardless, substantive changes have since been made to the document over the course of the document's fifteen versions, therefore even if the first version were to somehow be viewed as part of the final rule, a new rulemaking would be required in order for the guidance contained in subsequent revisions to be legally binding. *Funeral Consumer Alliance, Inc. v. FTC*, 481 F.3d 860 (D.C. Cir. 2007).

² See NUREG-1307, Draft. Rev. 15, at pg. ii.

Attachment 2

NEI Comments on Revision 15, NUREG-1307

ADMINISTRATIVE PROCESSES USED TO ISSUE AND REVISE NUREG-1307 HAVE BEEN INSUFFICIENT TO ESTABLISH IT EITHER AS A RULE OR FORMAL GUIDANCE

have assumed or intended alternative interpretations. Accordingly, we address the regulatory status of NUREG-1307 below, beginning with the failure to adhere to the APA and, thus, the absence of any basis on which to assert that the document is to be construed as a regulation, having the force and effect of law.

In order for an administrative rule to be legally binding, and treated as a “legislative rule,” it must be promulgated through the formal notice and comment rulemaking procedures contained in the APA.³ Such legislative rules have the force and effect of law, and grant rights, impose obligations, or produce other significant effects on private interests. Alternatively, non-legislative or “interpretive” rules (those intended to merely interpret a statute or another rule, and which do not create new duties, rights, or obligations) are not subject to notice and comment procedures under the APA.⁴ But, when agencies attempt to bind parties with interpretive rules, regulated entities and the public are deprived of the right to participate in the rulemaking process.⁵

Based on past practice, it is not apparent whether the NRC considers NUREG-1307 to be either a legislative or interpretive rule (whereby the NRC is merely interpreting its regulations and informing the public of its construction of a particular statutory provision or definition). If NUREG-1307 is, in fact, intended to serve as a requirement—*i.e.*, the NRC is seeking to use the document itself to change licensee *obligations*—then each substantive revision of the document effectively seeks to re-write the regulation, impose new duties on licensees, and would be subject to APA notice and comment requirements. Yet the NRC has not promulgated NUREG-1307 under the APA’s notice and comment procedures. Thus, NUREG-1307, including its revisions, lack the force and effect of law.

³ *Election Privacy Information Center v. U.S. Dept. of Homeland Sec.*, 653 F.3d 1 (D.C. Cir. 2011)(it is enough for the agency’s statement to “purport to bind” those subject to it, that is, to be cast in “mandatory language” so the “affected private parties are reasonably led to believe that failure to conform will bring adverse consequences.”).

⁴ NRC practice, however, is to provide an opportunity for notice and comment on proposed guidance documents.

⁵ Courts have criticized agency use of guidance documents in the form of interpretive rules and policy statements, recognizing the potential problem that “[l]aw is made, without notice and comment, without public participation, and without publication in the Federal Register or the Code of Federal Regulations.” *Appalachian Power Co. v. EPA*, 208 F.3d 1015, 1020 (D.C. Cir. 2000). Accordingly, agency “interpretations contained in policy statements, agency manuals, and enforcement guidelines, all of which lack the force of law—do not warrant *Chevron*-style deference.” *Christensen v. Harris County*, 529 U.S. 576, 587 (2000).

Attachment 2

NEI Comments on Revision 15, NUREG-1307

ADMINISTRATIVE PROCESSES USED TO ISSUE AND REVISE NUREG-1307 HAVE BEEN INSUFFICIENT TO ESTABLISH IT EITHER AS A RULE OR FORMAL GUIDANCE

2. Failure to Incorporate NUREG-1307 by Reference

A mechanism the NRC might have considered employing to confer regulatory status, potentially as a rule, on NUREG-1307, would have been to incorporate the document by reference in the decommissioning rulemaking, in accordance with the provisions of the APA allowing incorporation by reference.⁶ Incorporation by reference can serve as a means of adopting external documents as part of a rule.⁷ The mechanism provides for the adoption of material as having been published in the *Federal Register*, and thereby providing a means to satisfy other statutory and regulatory provisions requiring publication in the *Federal Register*, including the APA rulemaking provisions.⁸

Despite citing NUREG-1307 in 10 C.F.R. § 50.75(c)(2) when that provision was originally adopted, the Commission did not indicate in the original decommissioning funding rulemaking that it intended to incorporate NUREG-1307 by reference. Further, the Commission never followed additional provisions applicable to incorporation by reference, such as requesting approval by the Director of the Federal Register,⁹ or demonstrating that the material is appropriate for reference in accordance with certain standards.¹⁰ Thus, the language in 10 C.F.R. Part 50 regarding the use of NUREG-1307—*i.e.*, that the escalation factor for burial charges “is to be taken” from NUREG-1307—cannot be interpreted as *requiring* the use of NUREG-1307.¹¹

In any event, it is unlikely that the document would have even been eligible for incorporation by reference in the first instance because such incorporation is not appropriate if a document was produced by the same agency that is seeking incorporation, unless it is shown to possess “unique

⁶ See 5 U.S.C. § 552(a)(1) allowing for incorporation by reference in lieu of publication of a document in the *Federal Register*.

⁷ See generally, 1 C.F.R. Part 51, “Incorporation By Reference.”

⁸ *Id.* at §51.1(a).

⁹ *Id.* at §51.5.

¹⁰ *Id.* at §51.7(a).

¹¹ 10 C.F.R. §50.75(c)(2).

Attachment 2

NEI Comments on Revision 15, NUREG-1307

ADMINISTRATIVE PROCESSES USED TO ISSUE AND REVISE NUREG-1307 HAVE BEEN INSUFFICIENT TO ESTABLISH IT EITHER AS A RULE OR FORMAL GUIDANCE

or highly unusual qualities.”¹² Also, because the initial version of the NUREG was not even available at the time of publication of the final decommissioning rule,¹³ the NRC could not have satisfied the requirement that the document be on file with the Office of the Federal Register prior to publication of the rule in the *Federal Register*.¹⁴ And, finally, the NRC would have been required to follow the incorporation by reference procedures with respect to *each* subsequent revision of NUREG-1307, an action that certainly was never undertaken.¹⁵

3. Failure to Adhere to the NRC Regulatory Analysis Processes for Issuance of Guidance

In addition to the failures to adhere to the APA, for the NRC to assert that NUREG-1307 and its revisions must be treated even as guidance the NRC should have performed—in accordance with its own processes—a Regulatory Analysis¹⁶ for each new revision of NUREG-1307. Absent such analyses, NUREG-1307 and its revisions do not even satisfy the NRC’s own policies applicable to the development of agency guidance. These facts provide further confirmation that NUREG-1307 should be treated as no more than a technical advisory report that NRC licensees may choose to follow or not.

Consistent with Executive Order 12866,¹⁷ and as a matter of policy, the NRC has committed to perform a Regulatory Analysis for all “significant regulatory actions”¹⁸ as described in the

¹² *Id.* at §51.7(b).

¹³ See 53 *Fed. Reg.* 24018, “General Requirements for Decommissioning Nuclear Facilities”, June 27, 1988, at 24031, 24042 (the final version of NUREG-1307 (Reference 27) was not available at the time the Final Rule was published).

¹⁴ See *e.g.*, 1 C.F.R. §51.3(a)(3).

¹⁵ *Id.* at §51.1(f).

¹⁶ “Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission,” NUREG/BR-0058, Revision 4 (September 2004). See also, “Regulatory Analysis Technical Evaluation Handbook,” NUREG/BR-0184 (January 1997).

¹⁷ Executive Order 12866 “Regulatory Planning and Review,” 58 *Fed. Reg.* 51735 (Oct. 4, 1993).

¹⁸ E.O. 12866 defines significant regulatory actions as including actions that “are likely to result in a rule that may (1) have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, [or] a sector of the economy....”

Attachment 2

NEI Comments on Revision 15, NUREG-1307

ADMINISTRATIVE PROCESSES USED TO ISSUE AND REVISE NUREG-1307 HAVE BEEN INSUFFICIENT TO ESTABLISH IT EITHER AS A RULE OR FORMAL GUIDANCE

Executive Order, *as well as* for an even broader range of regulatory actions that include “all mechanisms used by the NRC staff to establish or communicate generic requirements, guidance, requests, or staff positions that would affect a change in the use of resources by [NRC] licensees...”¹⁹ Thus, NRC Regulatory Analyses are typically performed for NRC regulations and orders, as well as bulletins, generic letters, regulatory guides, standard review plans and standard technical specifications, and for all actions that involve backfitting or that impose generic requirements (subject to review by the Committee to Review Generic Requirements).²⁰

With respect to NUREG-1307, no matter what regulatory stature the NRC intended to impart on the document, it is clear that it was postured to have generic applicability to licensees and that it would affect a change in the use of resources by NRC licensees. Therefore, it would be subject to the NRC Regulatory Analysis process.

Significantly, such analyses are intended to ensure that:

- The NRC’s regulatory decisions made in support of its statutory responsibilities are based on adequate information concerning the need for and consequences of proposed actions;
- Appropriate alternative approaches to regulatory objectives are identified and analyzed;
- No clearly preferable alternative is available to the proposed action; and
- Proposed actions subject to the backfit rule (10 CFR 50.109), and not within the exceptions at 10 CFR 50.109(a)(4), provide a substantial[footnote omitted] increase in the overall protection of the public health and safety or the common defense and security and that the direct and indirect costs of implementation are justified in view of this substantial increase in protection.²¹

None of these important factors have been considered or evaluated by the NRC with respect to NUREG-1307, including Revision 15. To highlight, we note first that, as the comments provided herein demonstrate, the NRC did not have “adequate information” on which to base its

¹⁹ NUREG/BR-0058, Rev. 4 at 5.

²⁰ *See Id.*, at vii.

²¹ *Id.*, at 4.

Attachment 2

NEI Comments on Revision 15, NUREG-1307

ADMINISTRATIVE PROCESSES USED TO ISSUE AND REVISE NUREG-1307 HAVE BEEN INSUFFICIENT TO ESTABLISH IT EITHER AS A RULE OR FORMAL GUIDANCE

determination of waste disposal costs. Nor have any alternatives to the approach taken by the NRC been proposed, let alone evaluated. And certainly no backfit determination (if applicable) has been performed.

Further, to emphasize the significance of the impact that revisions to NUREG-1307 can have, we note that the changes proposed by Revision 15 clearly fall within the reach of the “significant regulatory actions” standard of E.O. 12866. Specifically, if the erroneous modifications to Revision 15 are finalized, the increase in the decommissioning funding minimum required of NRC power reactor licensees would far exceed \$100 million. In fact, the impact on decommissioning funding minimums incurred by **each operating unit** could exceed \$100 million. And this impact would be felt essentially immediately. Licensees would be expected to adjust their decommissioning funding levels not only for the NRC, but the change would materially and significantly impact licensees’ internal accounting, the amount of funds required to be collected to satisfy the NRC, licensees’ external financial reporting regarding income/expenses, and potentially other regulatory obligations.²²

At bottom, the regulatory status of NUREG-1307 satisfies neither the requirements applicable to substantive rules and regulation, nor the requirements applicable to NRC guidance materials. While the industry is open to discussion as to what the status of NUREG-1307 should be, it is apparent that—absent further measures to address the procedural deficiencies noted above—in its current form, NUREG-1307(including Revision 15) can serve only as a technical advisory report. Thus, nuclear power plant licensees are in no way obligated to use the waste burial escalation factors included in NUREG-1307. Further, the material misapplication of pricing information discussed in Attachment 3 serves as a concrete example of why adequate process is not simply a formality: it is designed to avoid arbitrary decision-making by ensuring that regulators have access to the information and views necessary to make meaningful, fact-based decisions.

²² Both “costs to licensees” and “adverse effects on the efficient functioning of the economy and private markets” are included in the impacts that must be evaluated were a Regulatory Analysis be performed. *See id.*, at Section 4.3.4 “Estimation of Impacts,” p. 30

Attachment 3

NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS

I. Introduction

The minimum formula amount required as part of the ultimate demonstration of adequate decommissioning funding is calculated using the formulas provided in 10 C.F.R. § 50.75(c). These formulas account for variation in reactor type (*i.e.*, PWR, BWR) and are scaled downward for units with smaller power levels (expressed in MWth). The formulas provided in § 50.75(c) yield minimum decommissioning funding amounts in 1986 dollars, which must then be adjusted annually to account for escalation of labor, energy, and waste burial costs.¹ This adjustment is performed by applying an annual adjustment factor that is greater than or equal to $0.65L + 0.13E + 0.22B$: where L and E are escalation factors for labor and energy, respectively, and B is an escalation factor for Low Level Radioactive Waste (LLRW) burial. The NRC's regulations state that the waste burial escalation factor (B) "is to be taken from NRC report NUREG-1307, Report on Waste Burial Charges."²

NUREG-1307 explains that the waste burial escalation factor is calculated by dividing the waste burial and disposition costs for the current year by the 1986 waste burial costs. Expressed mathematically, the waste burial escalation factor = $(R_X + \Sigma S_X) / (R_{1986} + \Sigma S_{1986})$.³ Thus, the size of the numerator in this ratio is dictated by the estimate of LLRW burial costs for the current year. As those costs increase, the waste burial escalation factor increases, which increases the annual adjustment factor (assuming the labor and energy escalation factors are relatively stable or increasing), which, in turn, increases the minimum amount required to demonstrate reasonable assurance of adequate decommissioning funding. A decrease in the numerator would have the opposite effect.

II. The LLRW Disposal Pricing Information Contained in Revision 15 was Misapplied to the LLRW Volumes Derived in Table A-4 in an Arbitrary and Capricious Fashion

As discussed in Attachment 1, since 1998, the NRC has recognized the substantial savings that can be realized through effective LLRW processing by adopting the vendor disposal option in

¹ 10 C.F.R. § 50.75(c)(2).

² *Id.*

³ "Report on Waste Burial Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities," NUREG-1307, Rev. 15, at pg. 5-6 (Draft Rev. 15).

Attachment 3

NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS

Revision 8 of NUREG-1307. Through Revision 13 (2008), the pricing for the vendor disposal option was derived from price quotes provided by LLRW vendor companies. Beginning in 2010, with the publication of Revision 14, however, pricing for the vendor disposal option shifted from price estimates provided by waste vendors to a pricing proxy in the form of pricing for disposal of various types of Class A LLRW at the EnergySolutions disposal facility located in Clive, Utah. With that shift, the NRC applied the Clive disposal rates “to 100% of the Class A LLW volumes” in order to derive an updated LLRW cost estimate for the vendor disposal option, which, in turn, was used to update the B_x escalation factor for the vendor disposal option.⁴ This approach made sense, as no nuclear power plant outside of the Atlantic Compact and Northwest/Rocky Mountain compacts has access to the Barnwell or Hanford disposal facilities, and plants located within the Atlantic Compact are not necessarily required to send Class A LLRW to Barnwell.⁵ Further, disposal at the Clive facility is currently the least-cost option for disposal of Class A LLRW. Thus, the NRC’s assumption in Revision 14 that 100% of the Class A LLRW would be disposed of via the Clive site was based on the sound principle that licensees would act in an economically rational manner by pursuing the least-cost disposal option – *i.e.*, that no Class A waste which could be disposed of at Clive disposal prices would instead be voluntarily sent to a “full service direct disposal” facility (like Barnwell) at the much higher cost.⁶

In Revision 15 to NUREG-1307, while continuing to use pricing for disposal at the Clive site as a proxy for vendor disposal, the NRC attempted to make more nuanced distinctions between the volume of LLRW that is processed prior to disposal through vendors, and the volume of LLRW that is shipped directly to disposal facilities. In order to make these distinctions, the NRC used site-specific decommissioning funding estimates submitted by power reactor licensees for various regulatory purposes (*e.g.*, compliance with 10 C.F.R. § 50.75, 10 C.F.R. § 50.82), none

⁴ “Report on Waste Burial Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities,” NUREG-1307, Rev. 14, at pg. A.3 (Rev. 14).

⁵ Omnibus Low-Level Radioactive Waste Interstate Compact Consent Act (including the Atlantic Compact), Public Law 99-240, Title II, at Article IV, ¶i.12. (“The Commission may, upon petition, grant an individual generator or group of generators in the region the right to export wastes to a facility located outside the region. Such grant of right shall be for a period of time and amount of waste and on such other terms and conditions as determined by the Commission and approved by the affected host states.”).

⁶ Although we agree with the approach of applying Clive pricing to 100% of the Class A LLRW volume, we note that it is unclear whether this was actually the approach taken in Revision 14. *See* discussion of 85%/5% ratio on page 4 of Attachment 1.

Attachment 3

NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS

of which were aimed at specifically distinguishing volumes of waste that would be sent to processors from the volumes of LLRW that would be shipped directly to disposal facilities. Such distinctions are not always necessary to provide accurate cost estimates in the recent LLRW disposal market because processing costs are often built into a single price for “disposal.” Thus, considerable judgment and, more specifically, assumptions were necessary in order to glean and distinguish the percentage of LLRW processed and the percentage of LLRW to be shipped directly to disposal facilities.

More importantly—although the agency is now using disposal pricing for the Clive, Barnwell, and Hanford sites in NUREG-1307—the NRC divided the waste volumes into two categories: (1) LLRW to be sent to vendors for processing, and (2) LLRW to be shipped for direct disposal at any disposal facility, **including the Clive site**. Using these categories, the NRC concluded that 60% of the total LLRW volume would fall into Category 1 (“Percent of Processed Waste”) and 40% of the total LLRW volume would fall into Category 2 (“Percent of Direct Disposal”).⁷ The NRC then, inexplicably, applied the higher Barnwell disposal pricing to all of the waste volume in the “Direct Disposal” category—**including those waste volumes designated for disposal at the Clive site in the site-specific cost estimates cited in Table A-4 of NUREG-1307**. The pricing information was misapplied in this fashion, despite the explicit recognition in Revision 15 that “[i]n most cases, Class A LLW volume not processed by vendors is assumed to be directly disposed of at the Clive, Utah facility.”⁸ The most striking—although not the only—example of this misapplication of the disposal pricing can be demonstrated by examining the site-specific cost estimate for Duane Arnold, which is referenced in Table A-4. In this instance, the site-specific cost estimate revealed that all Class A LLRW was assumed to be disposed of at the Clive site pursuant to a life-of-plant contract between the licensee and EnergySolutions. Class A LLRW accounts of approximately 99% of the total LLRW volume in the Duane Arnold cost estimate. But when this information was translated into Table A-4, 100% of the waste volume was categorized as “Direct Disposal,” **to which Barnwell pricing was applied**. Misapplication of the pricing data and the Duane Arnold example were discussed with the NRC staff at a category 2 public meeting held on November 7, 2012. The presentation used by the industry in that meeting is included as Attachment 4.

⁷ Draft Rev. 15, at Table A-4.

⁸ Draft Rev. 15, at pg. A-4.

Attachment 3

NEI Comments on Revision 15, NUREG-1307

**CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND
CAPRICIOUS**

More generally, a sampling of the site-specific cost estimates referenced in Table A-4 reveals that, given the pricing information actually used in Draft Revision 15 (*i.e.*, pricing for disposal at Clive and Barnwell), the more relevant parsing of LLRW volume would be based on the LLRW disposal destination. For example, the two columns on the far right of the table below provide such a breakdown for some of the plants listed in Table A-4:⁹

Plant Name	<u>Rev. 15</u> Vendor Disposal Volume (percent processed LLRW)	<u>Rev. 15</u> Direct Disposal Volume (including waste destined for Clive and Barnwell)	<u>Site-Specific Estimate</u> Class A LLRW (Processed and/or destined for Clive)	<u>Site-Specific Estimate</u> Class B/C/GTCC (destined for Barnwell, or Barnwell as pricing proxy)
Palisades (SAFESTOR)	66%	34%	98%	2%
Pilgrim (SAFESTOR)	67%	33%	97%	3%
Vermont Yankee (DECON)	50%	50%	97%	3%
Vermont Yankee (SAFESTOR)	50%	50%	98%	2%
Braidwood 1	63%	37%	98%	2%

⁹ This data is meant to be illustrative and does not represent all of the plants listed in Table A-4. For example, data for the Salem and Hope Creek units were not included in this table, but will be addressed separately in a letter from PSEG Nuclear. These units, like Oyster Creek, are located in a state that is a member of the Atlantic LLRW compact. Although the site-specific estimates for the Salem and Hope Creek plants indicate that larger volumes of waste will be disposed of at the Barnwell site, we note that these estimates were prepared in 2002—six years prior to closure of the Barnwell site to out of compact waste in 2008. In any event, NEI does not recommend reconstructing Table A-4, but instead recommends that waste classification be used as a simple and meaningful method of categorizing LLRW volumes for disposal.

Attachment 3

NEI Comments on Revision 15, NUREG-1307

**CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND
CAPRICIOUS**

Plant Name	<u>Rev. 15</u> Vendor Disposal Volume (percent processed LLRW)	<u>Rev. 15</u> Direct Disposal Volume (including waste destined for Clive and Barnwell)	<u>Site-Specific Estimate</u> Class A LLRW (Processed and/or destined for Clive)	<u>Site-Specific Estimate</u> Class B/C/GTCC (destined for Barnwell, or Barnwell as pricing proxy)
(DECON)				
Braidwood 1 (SAFESTOR)	68%	32%	99%	1%
Braidwood 2 (DECON)	63%	37%	98%	2%
Braidwood 2 (SAFESTOR)	68%	32%	99%	1%
Byron 1 (DECON)	62%	38%	98%	2%
Byron 1 (SAFESTOR)	67%	33%	99%	1%
Byron 2 (DECON)	62%	38%	98%	2%
Byron 2 (SAFESTOR)	67%	33%	99%	1%
La Salle 1 (DECON)	79%	21%	99%	1%
La Salle 1 (SAFESTOR)	85%	15%	99%	1%

Attachment 3

NEI Comments on Revision 15, NUREG-1307

**CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND
CAPRICIOUS**

Plant Name	<u>Rev. 15</u> Vendor Disposal Volume (percent processed LLRW)	<u>Rev. 15</u> Direct Disposal Volume (including waste destined for Clive and Barnwell)	<u>Site-Specific Estimate</u> Class A LLRW (Processed and/or destined for Clive)	<u>Site-Specific Estimate</u> Class B/C/GTCC (destined for Barnwell, or Barnwell as pricing proxy)
La Salle 2 (DECON)	79%	21%	99%	1%
La Salle 2 (SAFESTOR)	85%	15%	99%	1%
Oyster Creek (DECON)	55%	45%	88%	12%
Oyster Creek (SAFESTOR)	63%	37%	94%	6%
Kewaunee (DECON)	12%	88%	97%	3%
Duane Arnold (DECON)	0%	100%	99%	1%
Duane Arnold (SAFESTOR)	0%	100%	99%	1%

Although this is just a sampling of the plants listed in Table A-4, it illustrates the disparity between the information provided in Table A-4 and the **relevant** volumetric distinctions that are important to properly applying the pricing information used in Revision 15. These volumetric

Attachment 3

NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS

distinctions track with LLRW classification, which is the method that NEI recommends NRC use in categorizing LLRW volumes for disposal. This proposal is discussed in further detail below.

In sum, misapplication of the pricing data—as described above—is **arbitrary and capricious because:**

- The great majority of the site-specific cost estimates relied upon by the NRC staff indicate that most (if not all) Class A LLRW will be disposed of at the Clive site;¹⁰
- The NRC explicitly acknowledged that the site-specific cost estimates revealed that “[i]n most cases, Class A LLRW volume not processed by vendors is assumed to be directly disposed of at the Clive, Utah facility;”¹¹

¹⁰ See, e.g., DECOMMISSIONING COST ANALYSIS FOR THE MONTICELLO NUCLEAR GENERATING PLANT, October 2005, at Section 5, pg. 2 (“ For the Envirocare [Clive] facility, an average disposal rate of . . . was used. This schedule was used to estimate the disposal fees for most plant components and all activated concrete unsuitable for processing or recovery.”); PRELIMINARY DECOMMISSIONING COST ANALYSIS FOR THE PILGRIM NUCLEAR POWER STATION, July 2008, at Section 1.7.7 (“The EnergySolutions' disposal facility was used as the destination for the majority of the waste volume generated by decommissioning (98%). EnergySolutions does not have a license to dispose of the more highly radioactive waste (Class B and C) generated in the dismantling of the reactor. As such, the disposal costs for this material (representing approximately 1.8% of the waste volume) were based upon Barnwell disposal rates as a proxy.”); DECOMMISSIONING COST ANALYSIS FOR THE PRAIRIE ISLAND NUCLEAR GENERATING PLANT, Aug. 2008, at Section 5 (“In the interim, and as a proxy, the EnergySolutions' disposal facility in Clive, Utah is used as the destination for the lowest level, Class A, radioactive waste.”)(footnote omitted); DECOMMISSIONING COST ANALYSIS FOR THE COOPER NUCLEAR GENERATING STATION, Dec. 2008, at Section 3.4.6 (“The cost to dispose of the majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at EnergySolutions facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) were based upon the last published rate schedule for noncompact waste for the Barnwell facility (as a proxy).”); DECOMMISSIONING COST ESTIMATE FOR THREE MILE ISLAND, UNIT 1, Feb. 2009, at Section 3.5.7 (“The cost to dispose of the majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at EnergySolutions' facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) were based upon the last available rate schedule for the Barnwell facility (as a proxy).”); DECOMMISSIONING COST ANALYSIS FOR THE LASALLE COUNTY STATION UNITS 1 AND 2, June 2009, at Section 3.5.6 (“The cost to dispose of the majority of the material generated from the decontamination and dismantling activities is based upon Exelon's current disposal agreement with EnergySolutions for its facility in Clive, Utah. Since the EnergySolutions facility is not able to accept the higher activity waste (Class B and C) generated in the decontamination of the reactor vessel and segmentation of the components closest to the core, the cost of disposal of this material at a yet-to-be determined facility were based upon Exelon's last negotiated rates for the Barnwell facility.”); DECOMMISSIONING COST ESTIMATE STUDY FOR THE DUANE ARNOLD ENERGY CENTER, REV. 1, Jan. 2010, at Section 3.5 (“In accordance with the existing Life-of-Plant Disposal Agreement (Ref. No. 8), all Class A waste that meets the Clive facility waste acceptance criteria is to be disposed of at Clive. All reported waste disposal costs include packaging, transportation, and any applicable surcharges.”).

¹¹ Draft Rev. 15, at pg. A-4

Attachment 3

NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS

- The Clive site is currently the least-cost disposal option for Class A LLRW and accepts Class A LLRW nationally, without restriction by the Northwest Compact;
- Application of Barnwell pricing to Class A LLRW destined for the Clive site requires the assumption that licensees will act in an economically irrational fashion by voluntarily paying a higher price to dispose of Class A LLRW at the Barnwell facility, rather than the Clive site;
- Application of the Barnwell pricing to Class A LLRW destined for the Clive site ignores the fact that South Carolina law currently prohibits the disposal of Class A LLRW generated outside of the Atlantic Compact (*i.e.*, New Jersey, Connecticut, South Carolina) at the Barnwell site.¹² Stated more directly, disposal of nonregional waste at the Barnwell site is currently illegal.

Further, misapplication of the pricing data was not a mistake. To the contrary, the NRC explicitly described this arbitrary mischaracterization as a “Key Assumption” in a presentation discussed at the November 7, 2012, category 2 public meeting referenced above.¹³ Specifically, slide 8 of that presentation states:

¹² “Atlantic Interstate Low-Level Radioactive Waste Compact Implementation Act,” SC ST § 48-46-40(A)(6)(a)(“After fiscal year 2008, the board shall not authorize the importation of nonregional waste for purposes of disposal.”).

¹³ The entire NRC presentation from the November 7, 2012 public meeting is included as Attachment 5 to this letter.

Attachment 3

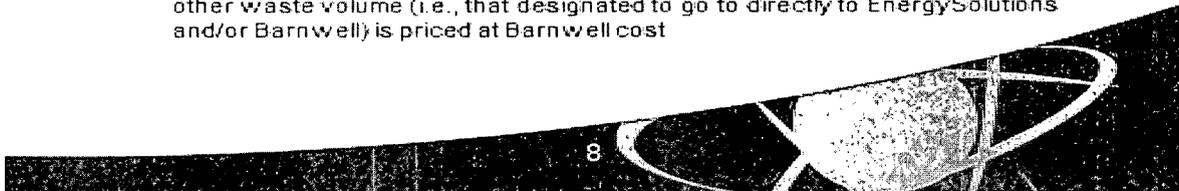
NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS



NUREG-1307, Revision 15 (Draft)

- No price quotes obtained from vendors
- Price quote obtained for EnergySolutions Utah disposal facility
- Based on available data, B_x for vendor option based on EnergySolutions Utah facility data only
- Assumed 60% of LLW goes to waste vendors and 40% goes to generic LLW site (Barnwell)
 - Change made to further bring the formula decommissioning cost estimate into alignment with site-specific decommissioning cost estimates (split reflects the weighted average of the percentage of the total LLW volume going to vendors based on data from the site specific decommissioning cost estimates – Table A-4)
 - Key Assumption: waste vendor volume is priced at EnergySolutions cost and all other waste volume (i.e., that designated to go to directly to EnergySolutions and/or Barnwell) is priced at Barnwell cost



This “Key Assumption” was developed in a results-driven attempt to increase the minimum formula amount described in 10 C.F.R. § 50.75—with no regard for the fact that the “Key Assumption” clearly misrepresents actual LLRW disposal costs, and without any apparent evidence linking LLRW disposal costs to the NRC staff’s concern that the formula amount does not align with site-specific decommissioning cost estimates.

More specifically, slide 8 from the NRC’s November 7 presentation states that the NRC modified the vendor disposal option in Revision 15 in order to “bring the formula decommissioning cost estimate into alignment with site-specific decommissioning cost estimates.” On slide 9, the NRC stated that revising Revision 15 so that the Clive disposal pricing applies to 95% of the decommissioning LLRW (*i.e.*, Class A LLRW) and Barnwell pricing applies to the remaining 5% (*i.e.*, Class B/C LLRW)—a ratio that NEI believes best reflects the current LLRW disposal landscape as well as the information contained in the site-specific cost estimates used by the NRC to develop Revision 15—“would make under estimation of decommissioning costs by the formula even worse.”¹⁴ So, in order to address a general concern regarding disparities between the site-specific cost estimates and the amount derived by

¹⁴ See Attachment 5.

Attachment 3

NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS

application of the formula required under 10 C.F.R. § 50.75, the available LLRW disposal pricing information was misapplied to ensure that the “correct” result was obtained (*i.e.*, an increase in the minimum formula amount). In addition to being inappropriate on its face, this misapplication of data is even more perplexing given that, in response to a direct question during the November 7 public meeting, the NRC staff stated that it did not believe that LLRW burial costs were the cause of its concerns regarding the adequacy of the minimum funding amounts calculated pursuant to 10 C.F.R. § 50.75. The purpose of revising NUREG-1307 is to ensure that the waste burial escalation factor provides a reasonably accurate and meaningful adjustment to the minimum amounts calculated pursuant to the requirements of 10 C.F.R. § 50.75. It should not be used as an opportunity to “fix” perceived problems with the minimum funding formula that would otherwise require a rulemaking to modify 10 C.F.R. Part 50.

Indeed, as discussed above in Attachment 1, the arbitrary “Key Assumption” relied upon in Revision 15 would increase the minimum formula amount by approximately \$134,589,150.00 for a BWR with a thermal power rating of 3,400 MWth and approximately \$129,985,050.00 for a PWR with a thermal power rating of 3,400 MWth. Changes to regulatory documents that have impacts of this magnitude must be fact-based, logical, and rational. Revision 15 to NUREG-1307 meets none of these criteria and should not be finalized with this fatal flaw.

III. If Revision 15 is Finalized by December 31, 2012, Waste Volumes Should be Categorized by Waste Class and Clive Pricing Applied to All Class A LLRW

Waste classification is currently the best indicator of where LLRW will be disposed. Specifically, as borne out in the great majority of the site-specific cost estimates referenced in Table A-4, licensees will exercise economically rational behavior by selecting the least-cost option for Class A LLRW disposal. At the current time, that least-cost option is disposal at the Clive, Utah site. Thus, it makes sense to categorize LLRW volume by waste classification, and to apply disposal pricing provided by EnergySolutions for the Clive site to that waste volume. Until a more realistic option presents itself, pricing for the Barnwell facility could be used as a pricing proxy for Class B and C LLRW.

EPRI has published a number of experience reports for the nuclear power plant decommissioning projects conducted in the United States. LLRW volume data was taken from the following reports to arrive at the decommissioning waste volume estimates provided in the table below:

- EPRI Report # 1011734, Maine Yankee Decommissioning – Experience Report

Attachment 3

NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS

- EPRi Report # 1013511, Connecticut Yankee Decommissioning – Experience Report
- EPRi Report #1015121, Rancho Seco Nuclear Generating Station Decommissioning Experience Report

Summary of Decommissioning Waste Class Breakdown

Waste Class	PWR Volume ft ³ /decommissioning	% of PWR Total	BWR Volume ft ³ /decommissioning	% of BWR Total
A	612,200	97.6 %	1,000,000	98.5 %
B/C	15,090	2.4 %	15,090	1.5 %
Total	627,290	100 %	1,015,090	100 %
Potentially Disposable at a RCRA Disposal Facility	414,000	66 %	670,000	66 %

Based on the EPRi results, if the NRC decides to finalize Revision 15 by December 31, 2012, without additional stakeholder input, NEI recommends that the NRC use a volume ratio of 95%/5% for what was formerly known as the “Vendor Disposal Option.” More specifically, this would provide an option allowing licensees to assume that 95% of their total LLRW volume (*i.e.*, all Class A LLRW) will be disposed of at Clive, Utah rates. Barnwell pricing would be used as a proxy for the remaining 5% of the waste volume (*i.e.*, Class B/C LLRW). This fact-based approach is rational and credible because:

- It is consistent with the NRC’s observation that “[i]n most cases, Class A LLW volume not processed by vendors is assumed to be directly disposed of at the Clive, Utah, facility.”¹⁵
- It properly assumes that licensees will act in an economically rational way by disposing of Class A LLRW at the Clive site, which is currently the least-cost disposal option for

¹⁵ Draft Rev. 15, at pg. A-4.

Attachment 3

NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS

- Class A LLRW and accepts Class A LLRW nationally, without restriction by the Northwest Compact;
- It recognizes the fact that South Carolina law currently prohibits the disposal of Class A LLRW generated outside of the Atlantic Compact (*i.e.*, New Jersey, Connecticut, South Carolina) at the Barnwell site.¹⁶
 - The NRC updates NUREG-1307 regularly and future updates can take changes in the LLRW environment into account.

In addition, this approach is appropriately conservative because:

- **Processing will reduce waste volumes:** The reason that decommissioning projects rely on waste vendors is to reduce the percentage of waste that requires disposal as Class A LLRW. As observed in NUREG-1307, there are a variety of commercially available volume reduction techniques. Decommissioning projects also evaluate other potential disposal pathways, including onsite disposal and survey and release of waste to maximize the portion that can be disposed of in an industrial landfill. Thus, the involvement of vendors offers the prospect of reducing the volume priced as Class A LLRW.
- **Contract pricing provides reduced rates:** The rates for Class A disposal that are used in NUREG-1307 are higher than those available to the vast majority of nuclear power plant owners. EnergySolutions has Life-of-Plant (LOP) Disposal Agreements with 11 utilities or utility consortiums representing 84 power plants. Contracted rates for disposal of decommissioning waste include discounts from standard pricing, thus the actual rates that will be made are lower than the rates assumed in NUREG-1307.
- **The volume ratio overestimates Class B/C wastes:** Assuming that 95% of the decommissioning waste is Class A is conservative based on historical experience, and that percentage is likely to become even more conservative in the future. For the Zion decommissioning project that EnergySolutions currently is performing, the estimate of Class B/C waste is <0.1%. In addition, the estimates generated by EPRI indicate Class A LLRW will comprise 97.6% and 98.5% of the total LLRW volume generated during decommissioning of PWRs and BWRs, respectively. EPRI's analysis also estimates up to

¹⁶ "Atlantic Interstate Low-Level Radioactive Waste Compact Implementation Act," SC ST § 48-46-40(A)(6)(a) ("After fiscal year 2008, the board shall not authorize the importation of nonregional waste for purposes of disposal.").

Attachment 3

NEI Comments on Revision 15, NUREG-1307

CHANGES TO THE VENDOR DISPOSAL OPTION IN REVISION 15 ARE ARBITRARY AND CAPRICIOUS

66% of the total volume of LLRW generated through decommissioning may be suitable for disposal at industrial landfills (rather than near-surface disposal facilities licensed to accept LLRW).

- **Opening of the Texas Compact disposal facility could reduce Class B/C backlogs:** NUREG-1307 notes that licensees should plan for increased costs due to backlogs of Class B/C that will drive up decommissioning costs. The Waste Control Specialists' (WCS) disposal site in Texas is now operating and the Texas Low-Level Radioactive Waste Disposal Compact Commission has approved multiple petitions to import LLRW produced by non-compact generators. Thus, the WCS facility could provide a disposal outlet for Class B and C wastes during operation, reducing potential for these waste streams to result in increased decommissioning costs.

Given the information provided in Revision 15, NEI anticipates that adoption of a 95%/5% option would result in a B_x of approximately 10.966 for a PWR and 11.845 for a BWR.

Attachment 4

NEI Comments on Revision 15, NUREG-1307

**NUCLEAR INDUSTRY VIEWS ON TABLE A-4 OF PROPOSED REVISION
15 TO NUREG-1307**

NRC PUBLIC MEETING

NOVEMBER 7, 2012

Nuclear Industry Views on Table A-4 of Proposed Revision 15 to NUREG-1307

NRC Public Meeting
November 7, 2012

§ 50.75 Reporting and recordkeeping for decommissioning planning.

(c) Table of minimum amounts (January 1986 dollars) required to demonstrate reasonable assurance of funds for decommissioning by reactor type and power level, P (in MWt); adjustment factor.¹

	<i>Millions</i>
(1)(1) For a PWR:	
greater than or equal to 3400 MWt	\$105
	<i>Millions</i>
between 1200 MWt and 3400 MWt (For a PWR of less than 1200 MWt, use P=1200 MWt)	\$(75+0.0088P)
(11) For a BWR:	
greater than or equal to 3400 MWt	\$135
between 1200 MWt and 3400 MWt (For a BWR of less than 1200 MWt, use P=1200 MWt)	\$(104+0.009P)

- Minimum funding to provide reasonable assurance calculated as (1986 dollars):
 - PWR \geq 3400 MWt - \$105 million
 - BWR \geq 3400 MWt - \$135 million
 - Scaled downward for smaller units
- Values are adjusted annually to take into account escalated labor, energy and waste burial costs

§50.75 Reporting and recordkeeping for decommissioning planning.

(c) Table of minimum amounts (January 1986 dollars) required to demonstrate reasonable assurance of funds for decommissioning by reactor type and power level, P (in MWt); adjustment factor. ¹

(2) An adjustment factor at least equal to $0.65 L + 0.13 E + 0.22 B$ is to be used where L and E are escalation factors for labor and energy, respectively, and are to be taken from regional data of U.S. Department of Labor Bureau of Labor Statistics and B is an escalation factor for waste burial and is to be taken from NRC report NUREG-1307, "Report on Waste Burial Charges."

- Annual adjustment using the following formula:
 - $0.65L + 0.13E + 0.22B$
 - L = Labor escalation factor
 - Source: U.S. Dept. Labor
 - E = Energy escalation factor
 - Source: U.S. Dept. of Labor
 - **B = LLRW burial escalation factor**
 - **Source: NUREG-1307**

Table 2-1 Values of B_x as a Function of LLW Burial Site, Waste Vendor, and Year^(a)

Year	B _x Values for Washington Site ^(b)				B _x Values for South Carolina Site								B _x Values for Generic LLW Disposal Site ^(e)			
	Direct Disposal		Direct Disposal with Vendors ^(f)		Atlantic Compact ^(c)				Non-Atlantic Compact ^(d)				Direct Disposal		Direct Disposal with Vendors ^(f)	
	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR
2012	7.975	6.709	7.631	6.337	29.764	26.062	17.892	17.083	NA	NA	NA	NA	29.764	26.062	17.892	17.083
2010	8.035	7.423	6.588	5.458	27.292	24.356	12.280	12.540	NA	NA	NA	NA	27.292	24.356	12.280	12.540
2008	8.283	23.185	5.153	20.889	25.231	22.504	9.872	11.198	NA	NA	NA	NA	25.231	22.504	9.872	11.198
2006	6.829	11.702	3.855	9.008	22.933	20.451	8.888	8.845	8.888	8.845	8.888	8.845	NA	NA	NA	NA
2004	5.374	13.157	3.846	11.755	19.500	17.389	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2002	3.634	14.549	5.748	15.571	17.922	15.988	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

For purposes of today's discussion, we are primarily concerned with the B_x values for the "Vendor Option"

- (a) The values shown in this table are developed in Appendix B, and all values are normalized to the 1986 Washington PWR and BWR values by dividing the calculated burial costs for each site and year by the Washington site burial costs calculated for the year 1986.
- (b) Effective 1/1/93, the Washington site no longer accepted waste from outside the Northwest and Rocky Mountain Compacts.
- (c) Effective 7/1/2000, rates are based on whether a waste generator is or is not a member of the Atlantic Compact.
- (d) Effective 7/1/2008, the South Carolina site no longer accepted waste from outside the Atlantic Compact.
- (e) B_x values for the generic site are assumed to be the same as that provided for the Atlantic Compact, for lack of a better alternative at this time.
- (f) Effective with NUREG-1307, Revision 15, this option assumes that 60% of the total waste volume is dispositioned using waste vendors and the Clive, Utah, disposal facility and the remaining 40% is dispositioned through direct disposal at one of the two full-service disposal facilities. See Section A.3.

How is B_x calculated?

B_x = Low-level waste (LLW) burial and disposition cost adjustment, January of 1986 to Year X (i.e., burial and disposition cost in Year X, divided by the burial cost in January of 1986),

$$= (R_x + \Sigma S_x) / (R_{1986} + \Sigma S_{1986})$$

where:

R_x = radioactive waste burial/disposition costs (excluding surcharges) in Year X dollars,

ΣS_x = summation of surcharges in Year X dollars,

R_{1986} = radioactive waste burial costs (excluding surcharges) in 1986 dollars, and

ΣS_{1986} = summation of surcharges in 1986 dollars

B_x is the ratio of current disposal costs & surcharges : 1986 costs & surcharges. If numerator (i.e., current disposal costs and surcharges) is incorrectly inflated, B_x will be incorrectly inflated.

NUREG-1307, at pgs. 5-6

How is B_x calculated for “Vendor Option”?

In support of NUREG-1307, Revision 15, price quotes to dispose all components of the reference PWR and BWR were obtained for disposal of Class A LLW at the Clive, Utah, disposal facility. Unit costs, exclusive of taxes, were provided for several different categories of components, which are listed in Table A-3. These rates assume no volume discounts, which can be substantial. In addition, a 10 percent tax was assumed. Under the vendor option, the rates in Table A-3 were applied to 60 percent of the Class A LLW volumes, which assumes a vendor/direct disposal LLW volume ratio of 60/40 with 60 percent of the waste generated from decommissioning being shipped to a waste vendor (vendor disposal) and 40 percent being shipped to a full-service disposal facility for disposal (direct disposal). This ratio is based on recently submitted licensee-developed site-specific decommissioning cost estimates, as discussed above, representing more than 30 power reactor decommissioning scenarios. Information on LLW disposition assumptions used in each of these estimates is summarized in Table A-4, which also shows the vendor and direct disposal ratios assumed in the licensee-submitted estimates. The staff will continue to collect additional data and may make additional updates to the vendor disposal ratio in future revisions to NUREG-1307, based on updated information.

NUREG-1307, at pg. A-5

Vendor Option Assumes:

- Clive rates applied to 60% of LLW volume
- Barnwell rates applied to 40% of LLW volume (for Atlantic Compact and Generic Disposal Site)
- Barnwell rates are higher than the Clive rates
- **The price difference between the “Direct Disposal” and “Vendor Disposal” option in Rev. 15 appears to be the pricing difference between disposing of waste at the Clive site (see Table A-3) versus disposing of waste at a “Full-Service” site priced like Barnwell (as opposed to whether a waste vendor/processor is actually involved in the disposal).**

Table 2-1 Values of B_x as a Function of LLW Burial Site, Waste Vendor, and Year^(a)

Year	B _x Values for Washington Site ^(b)				B _x Values for South Carolina Site								B _x Values for Generic LLW Disposal Site ^(e)			
	Direct Disposal		Direct Disposal with Vendors ^(f)		Atlantic Compact ^(c)				Non-Atlantic Compact ^(d)				Direct Disposal		Direct Disposal with Vendors ^(f)	
	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR	PWR	BWR
2012	7.975	6.709	7.631	6.337	29.764	26.062	17.892	17.083	NA	NA	NA	NA	29.764	26.062	17.892	17.083
2010	8.035	7.423	6.588	5.458	27.292	24.356	12.280	12.540	NA	NA	NA	NA	27.292	24.356	12.280	12.540
2008	8.283	23.185	5.153	20.889	25.231	22.504	9.872	11.198	NA	NA	NA	NA	25.231	22.504	9.872	11.198
2006	6.829	11.702	3.855	9.008	22.933	20.451	8.683	9.345	23.039	20.813	8.683	10.206	NA	NA	NA	NA
2004	5.374	13.157	3.846	11.755	19.500	17.389	7.790	8.347	21.937	17.970	7.934	8.863	NA	NA	NA	NA
2002	3.634	14.549	5.748	15.571	17.922	15.988	9.273	8.626	18.732	16.705	9.467	8.860	NA	NA	NA	NA

- (a) The values shown in this table are developed in Appendix B, with all values normalized to the 1986 Washington PWR and BWR values by dividing the calculated burial costs for each site and year by the Washington site burial costs calculated for the year 1986.
- (b) Effective 1/1/93, the Washington site no longer accepted waste from outside the Northwest and Rocky Mountain Compacts.
- (c) Effective 7/1/2000, rates are based on whether a waste generator is or is not a member of the Atlantic Compact.
- (d) Effective 7/1/2008, the South Carolina site no longer accepted waste from outside the Atlantic Compact.
- (e) B_x values for the generic site are assumed to be the same as that provided for the Atlantic Compact, for lack of a better alternative at this time.
- (f) Effective with NUREG-1307, Revision 15, this option assumes that 60% of the total waste volume is dispositioned using waste vendors and the Clive, Utah, disposal facility and the remaining 40% is dispositioned through direct disposal at one of the two full-service disposal facilities. See Section A.3.

How is B_x calculated for “vendor option”?

In support of NUREG-1307, Revision 15, price quotes to dispose all components of the reference PWR and BWR were obtained for disposal of Class A LLW at the Clive, Utah, disposal facility. Unit costs, exclusive of taxes, were provided for several different categories of components, which are listed in Table A-3. These rates assume no volume discounts, which can be substantial. In addition, a 10 percent tax was assumed. Under the vendor option, the rates in Table A-3 were applied to 60 percent of the Class A LLW volumes, which assumes a vendor/direct disposal LLW volume ratio of 60/40 with 60 percent of the waste generated from decommissioning being shipped to a waste vendor (vendor disposal) and 40 percent being shipped to a full-service disposal facility for disposal (direct disposal). This ratio is based on recently submitted licensee-developed site-specific decommissioning cost estimates, as discussed above, representing more than 30 power reactor decommissioning scenarios. Information on LLW disposition assumptions used in each of these estimates is summarized in Table A-4, which also shows the vendor and direct disposal ratios assumed in the licensee-submitted estimates. The staff will continue to collect additional data and may make additional updates to the vendor disposal ratio in future revisions to NUREG-1307, based on updated information.

How was 60%/40% ratio derived?

- Licensee-developed, site-specific cost estimates
 - These cost estimates were not developed for the purpose of updating NUREG-1307
- Interpretation of the data was necessary in order to derive the 60%/40% assumption
- Appears that the data was interpreted to fit the “Vendor” vs. “Direct” disposal paradigm (i.e., if no vendor is explicitly referenced, then direct disposal is assumed)
- BUT the “Vendor” vs. “Direct” distinction has come untethered from the distinction that actually drives pricing (i.e., disposal at Clive versus disposal at a “Full Service” site like Barnwell).

Problem:

- **Through application of the 60%/40% assumption, NUREG-1307 incorrectly assumes that Class A LLW – which is clearly designated for disposal at Clive – will instead be disposed of at a facility that is priced like the Barnwell facility.**

In addition, the staff reviewed preliminary decommissioning cost estimates that NPP licensees provided to the NRC for the following reasons:

- in accordance with 10 CFR 50.75(f)(2), which requires submittal of a preliminary decommissioning cost estimate at or about 5 years before the projected end of operations of the plant, or
- in support of the requirement in 10 CFR 50.75(f)(1) to report every 2 years on the status of the decommissioning fund for the plant.

A summary of the information licensees provided is presented in Table A-4 for several NPPs. This table shows licensees' assumptions on how LLW generated from decommissioning their plants will be dispositioned. The maximum amount that waste vendors were assumed to process and recycle is 85 percent (i.e., LaSalle 1 & 2 SAFSTOR scenario) of the total LLW volume, with the minimum of 0 percent (i.e., Duane Arnold) where all of the Class A LLW is assumed to be direct disposed at the Clive, Utah, facility. Generally, however, the vendor processed waste volume is assumed to be between 50 percent and 80 percent of the total waste volume. In most cases, Class A LLW volume not processed by vendors is assumed to be directly disposed of at the Clive, Utah, facility. However, a number of cases assume that some Class A LLW, representing 5 percent to 23 percent of the total LLW volume, is disposed of at a full-service disposal facility. In all cases, Class B and C LLW is assumed to be disposed of at a full-service disposal facility with disposal rates representative of recent Barnwell disposal facility rates for these LLW classes.

NUREG-1307, at pg. A-4

Does the 60%/40% assumption accurately reflect how much it will cost to dispose of LLW? No.

- NUREG-1307 acknowledges that, in most cases, Class A LLW not processed by vendors will be directly disposed of at the Clive site.
- For example, NUREG-1307 notes that for Duane Arnold 0% of waste would be processed via a waste vendor, but that all Class A waste is assumed to be direct disposed at the Clive site.
- **So, for Duane Arnold, NUREG-1307 categorizes 100% of the LLW as “Direct Disposal” (see Table A-4) – which assumes Barnwell pricing.**
- Categorizing disposal of Class A LLW this way contributed to derivation of the 40% “Direct Disposal” estimate.
- **Barnwell pricing is applied to that 40%, BUT in reality – e.g., Duane Arnold – the great majority of Class A waste attributed to “Direct Disposal” will actually be disposed of at Clive.**
- This type of discrepancy runs throughout Table A-4
- **Actual “Clive” to “Full-Service” ratios for are on the order of 95%/5%, not 60%/40%**

**Decommissioning Cost Estimate Study
for the
Duane Arnold Energy Center**

Project No. 137079

Revision 1

Prepared for:
FPL Energy Duane Arnold, LLC
3277 DAEC Road
Palo, IA 52324

Prepared by:
EnergySolutions, LLC
Commercial Decommissioning Services Division
100 Mill Plain Road, Second Floor, M/B 106
Danbury, CT 06811

Authored By: *Lisa J.S. Walker* 1/27/10
Lisa J.S. Walker, Senior Cost Engineer Date

Approved By: *Barry Sims* 1/27/10
Barry Sims, Project Manager Date

- New Report
- Title Change
- Report Revision
- Report Rewrite

Effective Date 1/27/10

Electronic documents, once printed, are uncontrolled and may become outdated.
Refer to Document Control authority for the correct revision.

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 EXECUTIVE SUMMARY	4
2.0 INTRODUCTION	8
2.1 Study Objective	8
2.2 Regulatory Framework	9
3.0 STUDY METHODOLOGY	11
3.1 General Description	11
3.2 Schedule Analysis	11
3.3 Decommissioning Staff	12
3.4 Waste Disposal	13
3.5 Final Status Survey	16
3.6 Contingency	16
3.7 Cost Reporting	17
4.0 SITE SPECIFIC TECHNICAL APPROACH	18
4.1 Facility Description	18
4.2 Decommissioning Periods for Scenario 1	18
4.3 Decommissioning Periods for Scenario 2	20
4.4 Decommissioning Periods for Scenario 3	22
4.5 Decommissioning Periods for Scenario 4	24
4.6 Decommissioning Staff	26
4.7 Spent Fuel Management Staff	26
4.8 Spent Fuel Shipments	27
5.0 BASES OF ESTIMATE AND KEY ASSUMPTIONS	28
6.0 STUDY RESULTS BY SCENARIO	33
6.1 Scenario 1 – Base Case	33
6.2 Scenario 2 – Base Case, Except SAFSTOR	40
6.3 Scenario 3 – Base Case, Except License Extension	47
6.4 Scenario 4 – Base Case, Except SAFSTOR and License Extension	51
7.0 REFERENCES	58

FIGURES

Figure 1-1	Scenario 1 Summary Schedule	7
Figure 6-1	Scenario 1 Summary Schedule	35
Figure 6-2	Scenario 2 Summary Schedule	41
Figure 6-3	Scenario 3 Summary Schedule	48
Figure 6-4	Scenario 4 Summary Schedule	52

3.4 Waste Disposal

.....

Class A Disposal Options and Rates

In accordance with the existing Life-of-Plant Disposal Agreement (Ref. No. 8), all Class A waste that meets the Clive facility waste acceptance criteria is to be disposed of at Clive. All reported waste disposal costs include packaging, transportation, and any applicable surcharges.

.....

Class B and C Disposal Options and Rates

.....

The question then becomes: what disposal rate is to be used in the decommissioning cost estimate for Class B and C LLRW and where is it to go? Since the cost estimate is based on current or present day dollars, the disposal cost for Class B and C LLRW should be equivalent to the cost that would be incurred if a new disposal facility were to be licensed and begin operations today. *EnergySolutions* has reviewed several studies developed in an attempt to quantify the disposal costs associated with a new disposal facility constructed in today's environment. Based on this review, it is *EnergySolutions*' belief that Class B and C LLRW disposal rates based on the published base rate and surcharge structure for the Barnwell facility is the most reasonable approach. This approach is also based on the fact that NRC requires utilities to update their decommissioning cost estimates every five years so that changes in disposal options and costs can be taken into account.

Table 6-8
Scenario 2 Waste Disposal Volumes
(Cost Excludes Contingency - 2008 Dollars)

**Barnwell Pricing
Assumed in Estimate**

Facility and Waste Class	Waste Weight (LBs)	Waste Volume (CF)	Burial Volume (CF)	Packaging Cost	Transportation Cost	Surcharge Cost	Base Burial Cost	Total Disposal Cost
Class B and C Facility								
Class B	122,531	1,287	2,104	\$207,315	\$722,333	\$4,226,706	\$1,209,590	\$6,365,943
Class C	168,430	884	2,015	\$905,000	\$745,693	\$8,172,367	\$1,158,424	\$10,979,483
GTCC								
	290,961	2,171	4,119	\$1,110,315	\$1,468,026	\$12,399,073	\$2,368,013	\$17,345,427
Energy Solutions								
Class A - Debris	13,304,744	224,683	226,652	\$569,787	\$2,382,954	\$0	\$12,375,127	\$15,327,868
Class A - Oversized Debris	4,488,865	67,190	67,190	\$47,153	\$447,470	\$0	\$7,054,916	\$7,549,539
Class A - CWF	2,808,407	38,430	38,489	\$496,994	\$3,846,607	\$0	\$8,319,692	\$12,663,294
Class A - Large Component	3,746,792	49,642	66,425	\$1,172,945	\$3,562,890	\$0	\$18,134,004	\$22,869,840
	24,348,808	379,944	398,755	\$2,286,880	\$10,239,921	\$0	\$45,883,740	\$58,410,540
Other								
Local Construction Debris								
Landfill	58,842,438	458,767	458,767	\$0	\$23,001			
Process for On-Site Fill	230,100,750	3,528,212	3,528,212	\$0	\$0			
Scrap Metal Recycler	161,197,811	1,100,763	1,100,763	\$0	\$354,635			
Grand Total	474,780,768	5,469,857	5,490,616	\$3,397,195	\$12,085,583	\$12,399,073	\$48,251,767	\$78,173,658

**Clive Pricing Assumed
in Estimate Consistent
with Life-of-Plant
Disposal Agreement**

Table A-4 Disposition Destination of LLW Assumed in Preliminary Decommissioning Cost Estimates^(a)

PLANT	TYPE	CAPACITY (MWe)	METHOD	DOCKET NO.	ADAMS ACCESSION NO. ^(b)	Class A, B, C & GTCC Waste Disposal	Processed Waste Disposal	Total Volume of Waste Generated	Percent of Processed Waste	Percent of Direct Disposal
						Volume (Thousands ft ³)	Volume (Thousands ft ³)	(Direct + Vendor Disposal)	(Vendor Disposal Option)	(Direct Disposal)
Braidwood 1	PWR	1178		50-456	ML100120241 - 01/11/2010					
	Scenario 1		DECON			114	192	306	62.74%	37.26%
Scenario 2			SAFSTOR			106	223	329	67.88%	32.12%
Braidwood 2	PWR	1152		50-457	ML100120241 - 01/11/2010					
	Scenario 1		DECON			114	192	306	62.74%	37.26%
Scenario 2			SAFSTOR			106	223	329	67.88%	32.12%
Byron 1	PWR	1164		50-454	ML093210130 -					
	Scenario 1								62.17%	37.83%
Scenario 2								67.57%	32.43%	
Byron 2	PWR									
	Scenario 1								62.17%	37.83%
Scenario 2								67.57%	32.43%	
Cooper	BWR									
	Scenario 1								57.25%	42.75%
Scenario 2								62.70%	37.30%	
Diablo Canyon 1	PWR									
	Scenario 1								Not available	100.00%
Scenario 2									Not available	100.00%
Diablo Canyon 2	PWR	1118		50-323	ML090600011 - 02/12/2002					
	Scenario 1		SAFSTOR			110	Not available	110	Not available	100.00%
Scenario 2			DECON			124	Not available	124	Not available	100.00%
Duane Arnold	BWR	580		50-331	ML100540029 - 01/27/2010					
	Scenario 1		DECON			401	Not available	401	Not available	100.00%
Scenario 2			SAFSTOR			401	Not available	401	Not available	100.00%
Hope Creek	BWR	1061	SAFSTOR		ML091820277 - 06/23/2009	228	233	461		

- Incorrectly inflates % of LLW assumed to be disposed of via “Full Service” facilities priced like Barnwell
- Under the current methodology used in NUREG-1307, for Atlantic Compact and the Generic Disposal Site “Direct Disposal” equates to disposal via at a facility priced like Barnwell.
- BUT the Duane Arnold site-specific cost estimate clearly indicates that all Class A waste will be disposed of at the Clive site, which is priced substantially lower than Barnwell

Attachment 5

NEI Comments on Revision 15, NUREG-1307

NUREG-1307, REV. 15, UPDATE

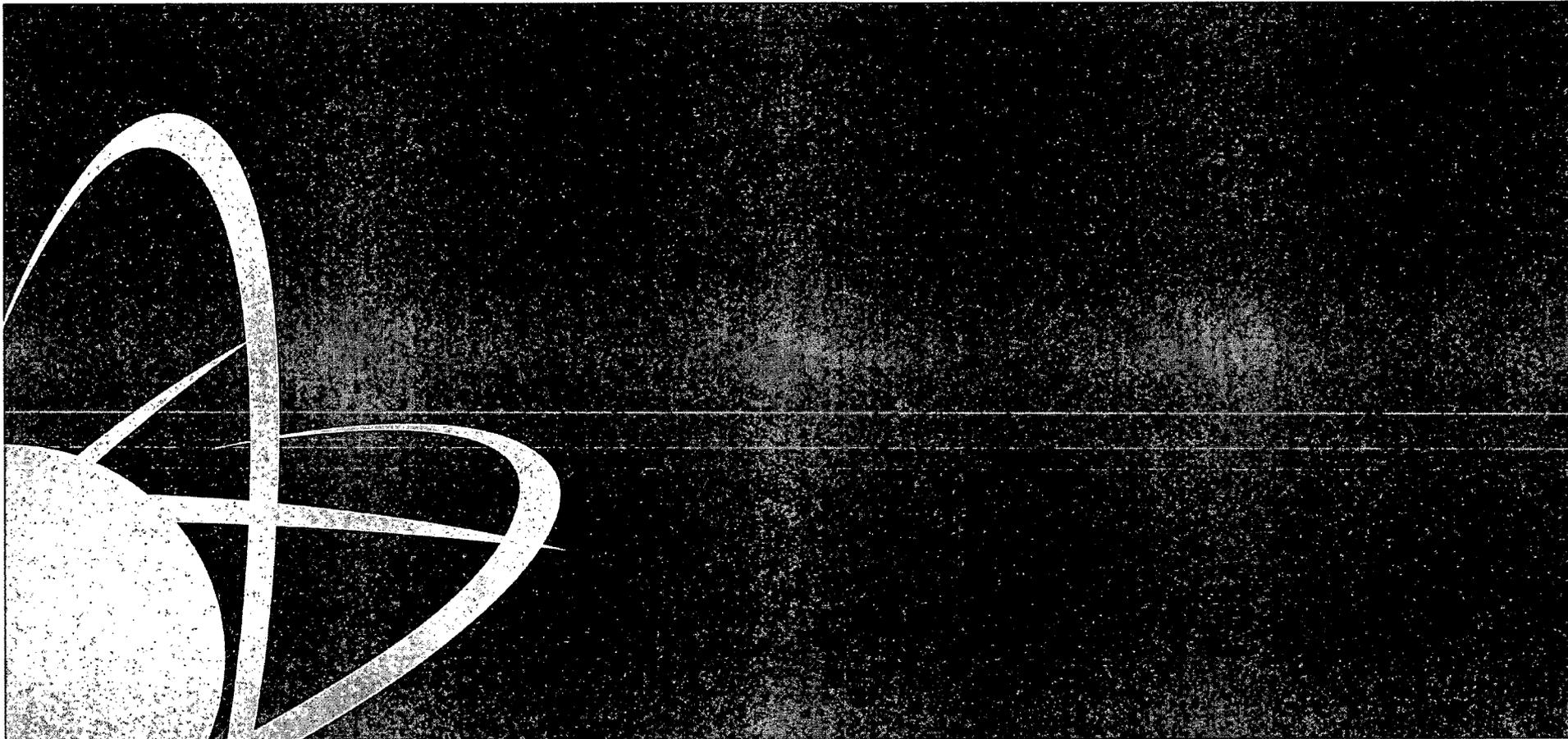
S.M. SHORT

J.A. GASTELUM

U.S. NUCLEAR REGULATORY COMMISSION

NRC PUBLIC MEETING

NOVEMBER 7, 2012



NUREG-1307, Rev. 15, Update

*S.M. Short
J.A. Gastelum*



Discussion Topics

- Historical Development and Changes
- Rev. 13 Changes
- Rev. 14 Changes
- Rev. 15 Changes

Historical Development and Changes

- NUREG-1307 first issued in July 1988
 - Bi-annual report required by 10 CFR 50.75(c): provides updated LLW burial cost coefficient (B_x) in minimum decommissioning fund formula
 - Basis for minimum decommissioning cost formula is provided in NUREG/CR-0130 Addendum 4 (PWR) and NUREG/CR-0672 Addendum 3 (BWR), which are in 1986 dollars
 - First issue of NUREG-1307 updated B_x from 1986 to 1988 dollars
 - B_x coefficients developed for 3 LLW disposal sites using available rate schedules for each: Barnwell, U.S. Ecology (Washington), and U.S. Ecology (Nevada)

Subsequent Revisions

- Revision 1, October 1989
- Revision 2, July 1991
- Revision 3, May 1993
 - U.S. Ecology Nevada site closed and is no longer included in updates
 - Barnwell imposes \$220/ft³ out-of-region access fee and \$74/ft³ in-region access fee
- Revision 4, June 1994
- Revision 5, August 1995
 - U.S. Ecology restricts access to Northwest and Rocky Mountain Compacts
 - Barnwell allows access for all states except Northwest and Rocky Mountain Compacts
- Revision 6, September 1996
- Revision 7, November 1997

Subsequent Revisions

- Revision 8, December 1998 (major update)
 - Waste vendor option first added (to address significant overestimating of burial costs due to assumption that all LLW is disposed of at Barnwell rates)
 - NEI assists in obtaining price quotes from 5 waste vendors
 - Yankee Rowe decommissioning data shows 63% of LLW shipped to waste vendors (NUREG-1307 analysis assumes 93-95%)
- Revision 9, September 2000
- Revision 10, October 2002
 - Price quotes obtained for 3 vendors
- Revision 11, June 2005
 - Price quotes obtained for 2 vendors
- Revision 12, 2007
 - Price quotes obtained for 3 vendors

NUREG-1307, Revision 13

- November, 2008
- Barnwell closed to states outside of the Atlantic Compact
 - Generic LLW disposal site added for first time.
 - Costs assumed to be the same as for Barnwell
- Price quotes obtained for 3 vendors
- First time price quote obtained for EnergySolutions Utah disposal facility (not used to avoid having to make major change in NUREG-1307 methodology)

NUREG-1307, Revision 14

- November, 2010
- No price quotes obtained from vendors
- Price quote obtained for EnergySolutions Utah disposal facility
- Based on available data, B_x for vendor option changed to use EnergySolutions Utah facility data only
- Text added to Rev. 14 report indicating that the vendor option may be further changed in the Rev. 15 update to reflect additional information

NUREG-1307, Revision 15 (Draft)

- No price quotes obtained from vendors
- Price quote obtained for EnergySolutions Utah disposal facility
- Based on available data, B_x for vendor option based on EnergySolutions Utah facility data only
- Assumed 60% of LLW goes to waste vendors and 40% goes to generic LLW site (Barnwell)
 - Change made to further bring the formula decommissioning cost estimate into alignment with site-specific decommissioning cost estimates (split reflects the weighted average of the percentage of the total LLW volume going to vendors based on data from the site specific decommissioning cost estimates – Table A-4)
 - Key Assumption: waste vendor volume is priced at EnergySolutions cost and all other waste volume (i.e., that designated to go to directly to EnergySolutions and/or Barnwell) is priced at Barnwell cost

Conclusion

- The vendor option in recent revisions of NUREG-1307 underestimates the cost of decommissioning (when compared to site-specific decommissioning cost estimates and actual costs reported for NPPs that have completed decommissioning)
 - Draft NUREG-1307, Rev. 15, attempts to better align the formula estimate and the site-specific decommissioning cost estimates
- Revising the vendor/full-service disposal ratio to be 95/5 recommended by NEI would make under estimation of decommissioning costs by the formula even worse