



CONVERSATION RECORD

01/18/2018

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU Andrew Welding		DATE OF CONTACT 01/18/2018	TYPE OF CONVERSATION <input type="checkbox"/> E-MAIL <input checked="" type="checkbox"/> TELEPHONE <input type="checkbox"/> INCOMING <input checked="" type="checkbox"/> OUTGOING
E-MAIL ADDRESS awelding@nd.edu		TELEPHONE NUMBER (574) 651-5037	
ORGANIZATION University of Notre Dame	DOCKET NUMBER(S) 030-00694		
LICENSE NUMBER(S) 13-01983-15	CONTROL NUMBER(S) 588775		

SUBJECT

Additional Information Needed on Decommissioning Cost Estimate

SUMMARY

In reviewing your most recent decommissioning cost estimate dated June 26, 2017, we noted several items which need additional clarification:

1. Please provide a current list of all radioactive materials used or stored under this license and an estimate of the amount of radioactive waste stored. Be sure to include on the list all materials that are listed on the license.
2. Please provide a clear justification for the following assumptions:
 - a) The number of laboratories that are assumed to need to be decommissioned and why.
 - b) It is assumed that 12 fume hoods will need to be decommissioned, please provide a justification.
 - c) Your cost estimate assumes \$10 per pound for waste disposal costs, please provide a justification for this value.
 - d) Please verify that this cost estimate assumes all work will be conducted by a third party.
 - e) Please verify that this cost estimate assumes decommissioning will take place immediately on cessation of operations without multi-year storage for decay periods.

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ACTION REQUIRED (IF ANY)

Please submit your response by February 28, 2018, and reference it to my attention as "additional information to control number 588775" to facilitate proper handling in our office. Your response must be currently dated and signed. If you have any questions or require clarification of any of the information stated above, please do not hesitate to contact me at 630-829-9607

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

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NAME OF PERSON DOCUMENTING CONVERSATION

Jennifer L. Bishop

SIGNATURE

CONVERSATION RECORD (continued)

SUMMARY: (Continued from page 1)

3. In your decommissioning cost estimate, you discuss an accelerator that has a potential to activate materials. This device is not currently listed on your NRC license and it is not clear what type of device you are describing. Please provide a more detailed description of this device and why it has been included in your cost estimate.
4. In your cost estimate you state that the Off-Site Source Recovery Program will recover two sealed sources at no cost to the university. Please verify that you have already registered these sources and the program has agreed to take possession of them. If they have not been registered, please provide a cost estimate for the cost of disposing of these sources.
5. In your cost estimate, you have provided estimates for the salaries and benefits of the workers needed to complete the decommissioning of your facility. Please provide a description of how these estimated costs were determined.
6. You did not provide a Certification of Financial Assurance as required by 10 CFR 30.35(e)(1)(iv). A sample has been attached to this conversation for your convenience.

Checklist 1 Master Checklist for Decommissioning Financial Assurance

Name of Licensee/Applicant Univeristy of Notre Dame

Mailing Address 636 Grace Hall, Notre Dame, IN 46556

Facility Address 636 Grace Hall, Notre Dame, IN 46556

License Number(s) 13-01983-15

Date of Submission DFP - 6/26/17 and 2/19/18; SG Test 11/22/17

Applicable Parts of 10 CFR (check all that apply):
☒ Part 30 ☐ Part 40
☐ Part 70 ☐ Part 72

Type of Submission:
☐ Certification of Financial Assurance → attach Checklist 2
☒ Decommissioning Funding Plan → attach Checklist 3
☐ Decommissioning Plan → attach Checklist 13-A

Type of Mechanism:

- ☐ Prepayment
 - ☐ Trust → attach Checklist 4-A
- ☒ Surety, Insurance, or Other Guarantee Method
 - ☐ Surety Bond → attach Checklist 5-A
 - ☐ Letter of Credit → attach Checklist 6-A
 - ☐ Insurance → attach Checklist 7-A
 - ☐ Parent Company Guarantee → attach Checklist 8-A
 - ☒ Self-Guarantee → attach Checklist 9-A
- ☐ External Sinking Fund → attach Checklist 10
- ☐ Statement of Intent → attach Checklist 11-A
- ☐ Special Arrangement with a Government Entity → attach Checklist 13-B

To help licensees and applicants make the initial decisions called for in Checklist 1, this section discusses each of the three major decision points:

- Confirmation that financial assurance is required (see Section A.1.2)
- Use of a Certification of Financial Assurance or a Decommissioning Funding Plan (see Section A.1.3)

A.3 Decommissioning Funding Plans

A DFP is a financial assurance demonstration that is based on a site-specific cost estimate for decommissioning the facility. The amount of the facility-specific cost estimate becomes the minimum required level of financial assurance coverage. Any licensee may use a DFP, but certain licensees *must* use a DFP, as discussed in Section A.1. Licensees who use DFPs must undertake the following actions, as summarized in Checklist 3:

- Prepare a site-specific decommissioning cost estimate (see Section A.3.1).
- Determine the means that will be used to adjust the cost estimate and associated funding levels periodically over the life of the facility (see Section A.3.2).
- Submit the required documentation (see Section A.3.3).

Checklist 3 Decommissioning Funding Plans

License Number(s): 13-01983-15

Applicable Parts of 10 CFR (check all that apply):

- | | |
|---|----------------------------------|
| <input checked="" type="checkbox"/> Part 30 | <input type="checkbox"/> Part 40 |
| <input type="checkbox"/> Part 70 | <input type="checkbox"/> Part 72 |

- ☒ Prepare a detailed, site-specific cost estimate (see Section A.3.1).
- ☒ Determine the means that will be used to adjust the site-specific cost estimate and associated funding levels periodically over the life of the facility (see Section A.3.2).
- ☒ Include the necessary documentation (see Section A.3.3).
- ☒ Include a detailed, site-specific cost estimate that includes the following (see Section A.3.4):
 - ☒ Detailed facility description
 - ☒ Description of the means that will be used to adjust the site-specific cost estimate and associated funding level
 - ☒ A certification statement that financial assurance for decommissioning has been provided in the amount of the decommissioning cost estimate (see Section A.2.4)
- ☒ Include a financial instrument and supporting documentation.

A.3.1 Preparing the Site-Specific Cost Estimate

In evaluating decommissioning cost estimates, the NRC considers the following factors:


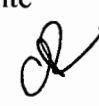

- the completeness of the estimate (i.e., scope);
- the level of detail presented; and
- the reasonableness of the estimate (i.e., the accuracy and magnitude of estimated costs).

For updates or revisions to a cost estimate, the NRC will also evaluate the following:

- the adequacy of the historical site assessment (HSA); and
- the adequacy of the characterization survey.

These factors are discussed briefly below. Sections A.3.1.1 through A.3.1.3 outline or describe the three basic parts of a cost estimate: the facility description, the estimated decommissioning costs, and key assumptions. Section A.3 concludes with a series of cost estimating tables that can assist licensees in preparing decommissioning cost estimates that are likely to be acceptable to NRC.

The site-specific cost estimate required for a DFP must assume that the work will be performed by an independent third party and should represent the licensee's best approximation of all direct and indirect costs of decommissioning its facilities under routine facility conditions. The assumption that routine facility conditions will prevail at the time of decommissioning implies that the cost estimate need not consider a worst-case decommissioning scenario. Similarly, however, the estimate should not be based on a scenario that is more optimistic than would be consistent with routine facility conditions. By way of example, the NRC believes it reasonable for decommissioning cost estimates to assume the following:




- Inventories of materials and wastes at the time of decommissioning will be in amounts that are consistent with routine facility conditions over time. For example, if radioactive waste is continually generated but is not disposed until after a certain period of time (e.g., 3 months) has elapsed, then it is reasonable for the cost estimate to assume that, at the time of decommissioning, the facility will have an inventory of waste equal to that typically on site just prior to routine disposal (i.e., a 3-month inventory). 
- Decommissioning activities take place immediately on cessation of operations without multiyear storage-for-decay periods. 
- Decommissioning will meet the criteria for unrestricted release, unless a successful demonstration has been made that the provisions of 10 CFR 20.1403, "Criteria for license termination under restricted conditions," can be met. 

Decommissioning activities do not need to include removal or disposal of nonradioactive structures and materials beyond that necessary to terminate the NRC license.

A decommissioning cost estimate should contain a substantial level of detail, consistent with the guidance presented in this section, to allow the NRC to fully evaluate the adequacy of the estimate. A series of cost estimating tables are provided at the end of this section to assist licensees in preparing decommissioning cost estimates that contain sufficient detail and are likely to be acceptable to NRC. *The NRC staff recommends that licensees pattern their cost estimates after the cost estimating tables presented at the end of this section.*

The labor estimates, material costs, and other factors of the cost estimate should have a clear and reasonable basis. Licensees may wish to consider the use of NRC-provided cost information such as that found in NUREG/CR-6477, "Revised Analyses of Decommissioning Reference Non-Fuel-Cycle Facilities," issued July 1998, and other NRC cost estimating references. The bibliography of this appendix cites other documents that may help in calculating estimates for decommissioning costs.








Complete decommissioning cost estimates contain three basic parts:

- a facility description, including subsurface; 
- the estimated decommissioning costs (including labor costs, nonlabor costs, and a contingency factor); and 
- identification and justification of the key assumptions used in the decommissioning cost estimate. 

These parts of cost estimates are discussed separately below and have been incorporated into the cost estimating tables at the end of Section A.3.

A.3.1.1 Facility Description

The facility description provides the basic context of the estimate. It should include both general and specific information, including the following:

- license number and type; 
- specific quantities and types of materials authorized by the license (e.g., by specific isotope); 
- general discussion of how licensed materials are used in the licensee's operations; 
- description of facility buildings, rooms, and grounds, including the number and dimensions of areas (e.g., laboratories) that require decontamination; 
- number and dimensions of facility components (e.g., fume hoods, glove boxes, laboratory benches, ductwork) that require decontamination; 
- an estimate of the volume of contaminated material, including that in the subsurface, containing residual radioactivity that will require remediation to meet the criteria for license termination; and 
- quantities of materials or waste accumulated prior to shipping or disposal (if applicable). 

The facility description should also address any other characteristics of the facility that need to be understood to evaluate the estimated decommissioning costs.

A.3.1.2 Estimated Decommissioning Costs

The cost estimate must account for the costs of all phases of the decommissioning process. The estimate should itemize each of the major decommissioning tasks or activities and should distinguish between labor costs and nonlabor costs, as described in Sections A.3.1.2.1 and A.3.1.2.2. The estimate should also explicitly incorporate a contingency factor, as discussed in Section A.3.1.2.3. Estimated costs must be based on reasonable and documented assumptions and provide sufficient funds to allow an independent third party to assume responsibility for and carry out the decommissioning of the facility if the licensee is unable to do so.

A.3.1.2.1 Labor Costs

Labor costs associated with all decommissioning tasks and activities must include basic wages and benefits for staff of a third-party contractor performing decommissioning-related tasks, overhead costs, and contractor profit (sufficient to allow an independent third party to carry out the decommissioning project). The source for the labor costs (e.g., Bureau of Labor Statistics' schedules of labor rates for specified areas of the country; current commonly used standard cost estimating manuals; or labor costs in current or projected third-party contracts with the licensee) should be described in sufficient detail to allow the NRC staff to confirm them. Licensees also should consider including other supporting material, such as electronic versions of spreadsheets used to build the cost estimate and web addresses for Internet-accessible data. The term "overhead" typically includes costs that are not directly traceable to any particular product produced or project conducted by the firm. Thus, overhead typically includes "period" costs, such as insurance, utilities, rent, supplies, property taxes, depreciation, and the costs of any wages, salaries, and benefits incurred as a result of the corporation's officers and support staff (e.g., accounting staff, legal staff, janitorial staff, security staff). To spread such costs across multiple products or projects fairly, firms usually calculate an "indirect" overhead rate that is applied to all direct labor hours (i.e., on those labor hours that are directly associated with particular products or projects). Licensees should provide justification for the overhead rates assumed in the cost estimate. Labor costs should be broken out by major task or activity; example categories include the following:

- planning and preparation of the facility and site for decommissioning, including activities such as preparing a detailed DP, preparing other State or local documentation, developing work plans, performing staff training, procuring special equipment, and characterizing the radiological condition of the facility;
- decontamination or dismantling of radioactive facility components;
- restoration of contaminated areas on facility grounds, if necessary;
- a final radiation survey (including sampling); and
- site stabilization and long-term surveillance, if necessary.

The cost estimate should also describe the techniques and methods that will be used to decontaminate facility components because these decontamination methods will impact the amount of labor required. If any of the decommissioning tasks or activities listed above do not apply to a particular facility, the estimate should explain why this is the case.

A.3.1.2.2 Nonlabor Costs

Nonlabor costs also are likely to arise during decommissioning; these costs may include the following:

- packing materials;
- shipping costs (these could be classified as labor costs for some facilities);
- disposal costs;
- other equipment and supplies (e.g., personal protective equipment, brushes);
- laboratory costs (including transport of samples to a third-party laboratory, testing and analysis, etc.); and
- miscellaneous expenses (e.g., license fees, insurance, taxes, security).

A.3.1.2.3 Contingency Factor

Because of the uncertainty in contamination levels, waste disposal costs, and other costs associated with decommissioning, the cost estimate is required to apply an "adequate" contingency factor. In general, a contingency of 25 percent applied to the sum of all estimated decommissioning costs should be adequate, but in some cases a higher contingency may be appropriate. The 25 percent contingency factor provides reasonable assurance for unforeseen circumstances that could increase decommissioning costs and should not be reduced or eliminated simply because foreseeable costs are low. Proposals to apply the contingency only to selected components of the cost estimate, or to apply a contingency lower than 25 percent, should be approved only in circumstances when a case-specific review has determined that there is an extremely low likelihood of unforeseen increases in the decommissioning costs (e.g., if the decommissioning costs are highly predictable and are established by binding contracts.)

The NRC's recommendation for the use of a 25-percent contingency factor is consistent with the analysis and guidance contained in NUREG/CR-6477, which applies a 25 percent contingency factor to all estimated costs associated with decommissioning various reference facilities.

A.3.1.3 Key Assumptions

The licensee must identify and adequately justify the key assumptions used in the decommissioning cost estimate. For example, claims of low levels of contamination should be supported by test results or by adequate discussion of how the licensed materials are used throughout the facility. Unusual items, such as disposal of radioactive materials at zero costs,

should be supported by relevant information (e.g., disposal agreements, contracts, or other information). In general, justifications based on "past experience" are likely to be adequate only if the past experience is relevant; therefore, the cost estimate should compare comparable decommissionings with respect to facilities, materials, processes, management, regulatory requirements, and price levels. If cost models are used, the models should be described in enough detail to determine whether they are adequate and appropriate given the characteristics of the facility.

The cost estimate should clearly state that it does not take credit for any salvage value that might be realized from the sale of potential assets (e.g., recovered materials or decontaminated equipment) during or after decommissioning. If estimated credits are taken for salvage value but are not fully realized at the time of decommissioning, the cost estimate (as well as the financial assurance) may be significantly low. In some instances, the NRC may approve credit for salvage value based on its review of explicit documentation provided by the licensee to justify the credit. 102

A.3.2 Adjusting the Cost Estimate

Licensees who use DFPs must specify the means (i.e., the method and frequency) by which they will periodically adjust their cost estimates and associated funding levels over the life of their facilities. In general, cost estimates should be updated with the current prices of goods and services at least every 3 years or when the amounts or types of material at the facility change. Triennial adjustments should be made to account for inflation, for other changes in the prices of goods and services (e.g., disposal cost increases), for changes in facility conditions or operations, and for changes in expected decommissioning procedures.

Experience with decommissioning sites indicates that certain operational events can affect the decommissioning cost estimate. The following types of events must be evaluated in the triennial adjustment for their effect on the decommissioning cost estimate:

- Leaks and spills—Facilities with fluid processes may have unplanned and uncontrolled leaks or spills. Occasionally leaks or spills will exceed the confinement capability of the facility or occur in an unconfined area and migrate into the environment. Once in the environment, the contaminants may spread through the subsurface, resulting in a potentially large volume of residual radioactivity in the subsurface that will require remediation before license termination. When such residual radioactivity is identified, the cost of remediating it must be included in the decommissioning cost estimate. OK
- Licensees should be alert for opportunities to reduce their decommissioning costs through voluntary activities to address leaks and spills. Two activities can be undertaken by licensees to limit the amount of financial assurance that will be required. First, by evaluating their processes that handle large volumes of fluids, installing process instrumentation sufficiently sensitive to detect small system losses, placing moisture monitors in areas not readily available for visual inspection, utilizing other leak detection systems, reengineering systems to eliminate hard-to-monitor features or components, and installing sumps and berms, licensees can reduce the possibility of experiencing subsurface residual radioactivity and minimize remediation costs (see Regulatory Guide 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," issued June 2008). Second, by OK

remediating spills and leaks promptly after their detection and quickly removing any residual radioactivity before it spreads, the amount of remediation will be decreased. Licensees will be able to avoid increasing their cost estimates to cover the costs that they would incur if they waited until the time of decommissioning to remediate the residual radioactivity. Prompt cleanup of spills and leaks during operations must meet occupational and public dose limits, but does not necessarily have to reduce residual radioactivity to meet the radiological criteria for license termination. The amount of prompt material cleanup may be selected by an analysis of present versus future remediation costs, in order to reduce decommissioning costs. However, the amount of radioactive material, if any, remaining after cleanup efforts have been completed must be evaluated to determine whether the amount of financial assurance for decommissioning needs to be increased.

- Newly detected soil or groundwater contamination—If new locations of soil or groundwater contamination are identified during site characterization prior to decommissioning or during decommissioning, the materials present must be identified and the cost of cleanup must be included in the cost estimate. N/A
- Increased waste inventory—The decommissioning cost estimate should include an estimate of waste remaining on site that will need dispositioning when the site is decommissioned. When the cost exceeds the amount provided in the previous estimate, the licensee must make an adjustment to account for the costs. OK
- Increased disposal costs—The cost estimate must include up-to-date disposal costs. OK
- Facility modifications—Modifications to the facility must be evaluated for their effects on decommissioning costs and the estimate adjusted appropriately. OK
- Changes in authorized possession limits—Changes in authorized possession limits may result in increasing the cost of decommissioning due to larger expected inventories of waste material, extensions to the area of contaminated surfaces, or additional volume of contaminated material that must be disposed of during decommissioning. OK
- Actual remediation costs that exceed the decommissioning cost estimate—During decommissioning, the actual expenditures should be tracked and compared in detail with the decommissioning cost estimate. The reasons why actual costs may be exceeding the estimated costs should be identified and evaluated. Both the cost estimate and the level of available funding should be increased in a timely manner. OK
- Onsite disposal—Onsite disposals must be evaluated to determine if they must be remediated to meet decommissioning criteria. If remediation will be required, then the cost must be included in the decommissioning cost estimate. N/A
- Use of a settling pond—Settling pond remediation must be included in the decommissioning cost estimate and include reasonable estimates of pond leakage. N/A

A.3.3 Submitting the Required Documentation

Under NRC's financial assurance regulations (10 CFR 30.35(e), 10 CFR 40.36(d), 10 CFR 70.25(e), and 10 CFR 72.30(b)), licensees who use DFPs must submit the following to the NRC:

APPENDIX A

- a detailed site-specific cost estimate for decommissioning (regulatory guidance is provided in Section A.3.1);
- a description of the means that will be used to adjust the site-specific cost estimate and associated funding levels periodically over the life of the facility (regulatory guidance is provided in Section A.3.2);
- a certification of financial assurance by the licensee that financial assurance for decommissioning has been provided in the amount of the decommissioning cost estimate; and
- an originally signed duplicate of the financial instruments that provide financial assurance for decommissioning.

10 CFR Part 72 licensees are not required to submit originals of the financial assurance documents. If certain information in the financial instrument (licensee's name, license number, and docket number and the name, address, and other contact information of the issuer, and, if a trust is used, the trustee) changes, the licensee must, within 30 days, submit financial instruments reflecting such changes.

This appendix describes the allowable financial instruments in general terms in Section A.1 and in detail beginning in Section A.4. Licensees should refer to these sections to ensure that their financial assurance instruments and supporting documentation will be acceptable to the NRC.

In addition to submitting these materials to the NRC, licensees must maintain records of these materials in their files. Licensees must adjust the cost estimate and submit the adjusted DFP to the NRC every three years.

Checklist 9-A Self-Guarantees

☒ Documentation is complete when the following are included:

☐ 1. self-guarantee agreement (originally signed duplicate),

☒ 2. letter from chief executive officer (CEO) or chief financial officer (CFO) of licensee, including applicable self-guarantee financial test,

☒ 3. auditor's special report confirming CEO or CFO letter and reconciling amounts in the CEO or CFO letter with licensee's financial statements,

☒ 4. licensee's audited financial statements for the most recent fiscal year, including the auditor's opinion on the financial statements, and

☐ 5. Checklist 9-B (if model self-guarantee wording is modified or not used)

☒ The licensee does not have a parent company holding majority control of its voting stock.

☒ The amount of the self-guarantee equals or exceeds: (a) the required coverage level or (b) the difference between a sinking fund and the required coverage level, if the self-guarantee is being combined with a sinking fund.

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Checklist 9-B Terms and Conditions Needed in Self-Guarantees

Use this checklist only if deviating from the wording recommended in Section A.9.12.

- ☐ Name and address of self-guarantor (licensee).
- ☐ Name and address of regulatory agency.
- ☐ The following four recitals are included:
 - ☐ 1. the authority of the self-guarantor to enter into the guarantee;
 - ☐ 2. a statement of the licensee's regulatory obligations as reason for the self-guarantee;
 - ☐ 3. identification of the facility(ies) (name, address, and license number) for which the guarantee provides financial assurance and the amounts guaranteed for decommissioning activities; and
 - ☐ 4. identification of financial test used by self-guarantor to demonstrate financial strength.
- ☐ Description of the primary obligation (required activities).
- ☐ Unequivocal statement of guarantee to include the following:
 - ☐ 1. condition(s) of liability, and
 - ☐ 2. effect on liability of a change in the status of the licensee.
- ☐ Statement that self-guarantor remains bound despite amendment or modification of license, reduction or extension of time of performance of required activities, or any other modification or alteration of an obligation of the licensee.
- ☐ Notice requirements.
- ☐ Discharge of the self-guarantor (release of obligations).
- ☐ Termination and revocation to include the following:
 - ☐ 1. termination on occurrence of contingency,
 - ☐ 2. voluntary revocation by self-guarantor, and
 - ☐ 3. effective date of termination or revocation.
- ☐ Self-guarantor's agreement to be subject to Commission orders.
- ☐ Self-guarantor's agreement to Commission's remedies in case of financial distress (i.e., bankruptcy or insolvency events).
- ☐ Self-guarantor's agreement to notify in case of financial distress (i.e., bankruptcy or insolvency events).
- ☐ Date.
- ☐ Signatures.
- ☐ Signature of witness or notary (signature block).