

# REGULATORY GUIDE

#### OFFICE OF NUCLEAR REGULATORY RESEARCH

**REGULATORY GUIDE 3.65** (Task CE 304-4)

STANDARD FORMAT AND CONTENT OF **DECOMMISSIONING PLANS FOR** LICENSEES UNDER 10 CFR PARTS 30, 40, AND 70

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#### A. INTRODUCTION

#### 1. GENERAL

Section 30.36, "Expiration and Termination of Licenses," of 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material"; Section 40.42, "Expiration and Termination of Licenses," of 10 CFR Part 40, "Domestic Licensing of Source Material"; and Section 70.38, "Expiration and Termination of Licenses," of 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," require, in part, all holders of specific licenses to submit a completed Form NRC-314 when they decide to terminate the license. (A copy of Form NRC-314 is provided in Appendix 1.)

On June 27, 1988, the Commission published amendments to its regulations in 10 CFR Parts 30, 40, and 70 (53 FR 24018), prescribing specific criteria for decommissioning nuclear facilities, effective July 27, 1988. Amended §§ 30.36, 40.42, and 70.38 require certain licensees to submit, on or before the license expiration date, a plan for completing decommissioning when the licensee decides to terminate the license. In particular, those sections require a licensee to submit a plan for completion of decommissioning if the procedures necessary to carry out decommissioning have not been previously approved by the NRC and could increase potential health and safety impacts to workers or to the public, such as in any of the following cases:

- Procedures would involve techniques not routinely applied during cleanup or maintenance operations;
- Workers would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during operation;
- 3. Procedures could result in significantly greater airborne concentrations of radioactive materials than are present during operation; or
- 4. Procedures could result in releases of radioactive material to the environment significantly greater than those associated with operation.

Large manufacturers under Part 30, uranium hexafluoride producers under Part 40, and processors and fuel fabricators under Part 70 would be included under this requirement. Broad scope materials programs licensed pursuant to 10 CFR Part 30, panoramic indicators, and large-scale well-logging operations licensed under 10 CFR Part 30 may also require submittal of a decommissioning plan. In some cases, licenses presently contain a specific condition that requires submittal of a decommissioning plan.

For clarification, it is noted that the term "decommissioning plan" refers to the plan submitted at the time the licensee decides to terminate the license. Guidance on preparing this decommissioning plan is presented in this regulatory guide. The term "decommissioning funding plan" refers to the plan submitted early in facility life that indicates the applicant's or licensee's financial

assurance provisions. Guidance on the decommissioning funding plan, including cost estimates and acceptable funding methods, will be contained in separate regulatory guidance in preparation.

Any information collection activities mentioned in this regulatory guide are contained as requirements in 10 CFR Parts 20, 30, 40, and 70, which provide the regulatory basis for this guide. The information collection requirements in 10 CFR Parts 20, 30, 40, and 70 have been cleared under OMB Clearance Nos. 3150-0014, 3150-0017, 3150-0020, and 3150-0009, respectively.

#### 2. PURPOSE AND APPLICABILITY

This regulatory guide, developed in conjunction with the amendments to the regulations concerning decommissioning, would be applicable to certain licensees (discussed above in Section 1) when they decide to permanently discontinue all licensed activities involving nuclear materials. The purpose of the guide is to identify the information needed by the NRC staff for evaluations involving decommissioning. The guide also provides a format for submitting this information. Conformance with this guide is not required, but its use will facilitate preparation of a decommissioning plan by licensees and timely, uniform review by the NRC staff. A different format will be acceptable to the staff if it provides an adequate basis for approval of a decommissioning plan. The guidance is appropriate for use in license amendments to partially clean up a nuclear facility and release that part for unrestricted use at a time other than at the decommissioning of the facility as a whole, e.g., cleanup of separate buildings.

The amended sections of the decommissioning rule (30.36(b), 40.42(b), 70.38(b)) require each licensee to notify the Commission promptly, in writing, and request termination of license when the licensee decides to terminate all activities involving material authorized under the license. This notification and request for termination of the license must include a decommissioning plan if required as noted in Section 1 above.

Because the amendments on decommissioning require approval of a decommissioning plan before starting decommissioning procedures and review and approval may take several weeks, it is recommended that the plan be prepared and submitted as soon as residual radioactive contamination has been assessed.

If the information requested in this guide in such sections as 2.1.3, 2.3, 3.2, 3.3, and 6 is the same as or similar to information currently required under the license, only changes need to be submitted. Information contained in previous submittals, statements, or reports filed under the license may be incorporated by reference, provided the reference is clear and specific. However, some cases may occur (e.g., Sections 2.1.3 and 3.5) in which a license amendment may be required to effect a change.

#### 3. FORMAT

# 3.1 Graphical Presentations

Graphical presentations such as drawings, maps, diagrams, sketches, and tables should be employed if the information may be presented more adequately or conveniently by such means. Due concern should be taken to ensure that all

information so presented is legible, that symbols are defined, and that scales are not reduced to the extent that visual aids are necessary to interpret pertinent items of information. These graphical presentations should be located in the section where they are primarily discussed.

References used may appear either as footnotes to the page where discussed or at the end of each chapter.

### 3.2 Physical Specifications

#### a. Paper size

(1) Text pages: 8-1/2 x 11 inches.

- (2) Drawings and graphics:  $8-1/2 \times 11$  inches; however, a larger size is acceptable provided the finished copy when folded does not exceed  $8-1/2 \times 11$  inches.
- b. <u>Paper stock and ink</u>. Suitable quality in substance, paper color, and ink density for handling and reproduction by microfilming or image-copying equipment.
- c. <u>Page margins</u>. A margin of no less than 1 inch should be maintained on the top, bottom, and binding side of all pages submitted.

#### d. Printing

(1) Composition: text pages should be single spaced.

(2) Typeface and style: should be suitable for microfilming or

image-copying equipment.

- (3) Reproduction: may be mechanically or photographically reproduced.
  All pages of text should be printed on both sides and the image printed head to head.
- e. <u>Binding</u>. Pages should be punched for standard 3-hole loose-leaf binders.
- f. <u>Page numbering</u>. Pages should be numbered with the digits corresponding to the chapter followed by a hyphen and a sequential number, e.g., the third page of Section 4 should be numbered 4-3. Do not number the entire report sequentially.
- g. Table of contents. A table of contents and an index of key items should be included.

# 3.3 <u>Procedures for Updating or Revising Pages</u>

Data and text should be updated or revised by replacing pages. The changed or revised portion on each page should be highlighted by a "change indicator" mark consisting of a bold vertical line drawn in the margin opposite the binding margin. The line should be of the same length as the portion actually changed.

All pages submitted to update, revise, or add pages to the report should show the date of change and change or amendment number. A guide page listing the pages to be inserted and the pages to be removed should accompany the revised pages. When major changes or additions are made, a revised table of contents should be provided.

#### CONTENT OF DECOMMISSIONING PLAN

#### 1. GENERAL INFORMATION

The licensee's name and address and the appropriate numbers of the licenses to be terminated should be furnished.

### 2. DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES

The amended sections of the rule on decommissioning require that a decommissioning plan, if submitted, contain a description of planned decommissioning activities. This section describes the information that should be submitted to provide an adequate description of those activities.

# 2.1 Decommissioning Objective, Activities, Tasks, and Schedules

### 2.1.1 Decommissioning Objective, Activities, and Tasks

In this section, the licensee should indicate the decommissioning objective and discuss how the proposed activities and tasks\* will achieve this objective and the reasoning used to select particular methods to be used in the decommissioning. The licensee should list or tabulate the major activities and tasks related to processes, systems, and equipment and land to be decommissioned. References 1, 2, and 3 contain information that may be helpful in developing a list of decommissioning activities and tasks. References 1-3 contain lists of examples of tasks and activities involved in decommissioning materials facilities. Further guidance is under development on these lists.

#### 2.1.2 Description

A description and an analysis of the proposed methods for accomplishing the activities and tasks listed in paragraph 2.1.1 should be presented. The description should include a discussion of historical information on operational occurrences that could adversely affect decommissioning safety (see Section 3.1), the current assessment of residual radioactive contamination, and potential accidents that could have a significant impact on decommissioning safety. The analyses should show that decommissioning can be accomplished in a safe manner.

# 2.1.3 Procedures

The licensee should state a commitment to conduct decommissioning activities and tasks in accordance with written procedures approved by licensee management. The control system that ensures that written procedures are prepared, reviewed, revised, approved, and implemented should be described.

# 2.1.4 Schedules

For major activities, the relationship between activities and tasks should be shown. The schedules for accomplishing interrelated activities and tasks should be presented. Schedules or diagrams should clearly indicate the estimated time for completion of decommissioning.

<sup>\*</sup>For the purposes of this guide, an activity is an organized unit of work for performing a function and may consist of several tasks. A task is a specific work assignment or job.

#### 2.2. Decommissioning Organization and Responsibilities

The organization with respect to the overall project should be described. Positions with responsibilities related to decommissioning safety should be identified and their functions described. The minimum qualifications for these positions should be presented. The discussion should address the project team, decommissioning staff, worker health and safety training, and the use, control, and management of subcontractors.

#### 2.3 Training

A description of the training program, including general and specific radiological safety training, for operators, contractor personnel, and other personnel should be presented. This section should also contain a description of the system for maintaining records of training received by personnel.

#### 2.4 Contractor Assistance

The licensee may choose to accomplish some or all decommissioning activities and tasks by using contractors. However, the responsibility for safety during decommissioning rests with the licensee. For each contracting organization, the scope of work, the contractor qualifications to perform work with radio-active material, and administrative controls to be used to ensure adequate health and safety protection should be described. The licensee should indicate which activities will be performed under subcontractor licenses and indicate the name, address, and license number of the subcontractor.

# 3. DESCRIPTION OF METHODS USED FOR PROTECTION OF OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY

The amended sections of the rule on decommissioning require that a decommissioning plan contain a description of the methods used to ensure protection of workers and the environment against radiation hazards during decommissioning. This section describes the information that should be presented to provide an adequate description of these methods. The licensee should include both administrative and technical issues in the descriptions.

#### 3.1 Facility Radiological History Information

If a decommissioning plan is required, the licensee should describe historical information that should be reviewed and dealt with in the decommissioning planning to ensure worker safety. This information is of two types: one is related to an indication of where in the facility work with radioactive materials has been performed; and the other is related to operational occurrences resulting in contamination that could have an affect on decommissioning safety.

With regard to the first type of information, the plan should include a list of all locations in the facility where any work with radioactive materials was ever performed, what material was involved, a description of the operations performed, and typical radiation and contamination levels during those operations. Maps and drawings of the facility showing all modifications made to radiological work sites during the life of the facility should be included.

With regard to operational occurrences, such things as spills, releases, or other accidents that resulted in significant residual radioactive contamination should be included in the plan. The licensee should also describe system and equipment design, including modification or revision, in high-radiation areas, normally inaccessible systems and equipment that may be contaminated, and any areas of the site that may be excessively contaminated. This type of information can be obtained from plant records and personnel familiar with the plant operations. This information is important to safety and should be considered when preparing plans for decommissioning (see Section 2.1.2). The decommissioning rule amendments require that the location of this information be identified and that this type of information be kept in an identified location; see amended paragraphs 30.35(g), 40.36(f), and 70.25(g).

Radiation levels of contaminated systems, structures, and components should be established. It is recognized that at the time the decommissioning plan is submitted, complete information may not be available. However, sources of radiation that are the basis for radiation protection should be described either by measurement or calculation. Information in this section should be updated as additional radiation surveys are made, but need not be submitted to the NRC. Radiation sources should be described by radioactivity level and location; major sources of radioactivity should be located on plant layout drawings. For all sources, the basis for determining the radioactivity levels should be provided.

# 3.2 Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)

The licensee should state the policy for keeping individual and collective occupational radiation exposure ALARA during decommissioning. Management positions responsible for radiation protection and maintaining occupational exposure ALARA during decommissioning should be described. If a licensee can demonstrate that an existing ALARA plan or other radiation protection program includes the ALARA information for this section, a separate ALARA plan for decommissioning would not be needed. Alternatively, the licensee may indicate modifications to the existing ALARA plan, radiation protection program, or ALARA plan for decommissioning to provide the information in this section.

This section should contain a description of methods for occupational radiation protection. It should provide information on equipment, special techniques, and practices that will be used by the licensee in meeting the standards for protection against radiation of 10 CFR Part 20, including ALARA. This would include, for example, a work activity control program to minimize worker exposure (including the criteria for issuing and terminating radiation work permits), a program for controlling sources and minimizing spread of contamination (see Section 3.3), a respiratory protection program to determine hazards and provide appropriate equipment (see Section 3.3), and a program to control the handling and storage of radioactive material.

# 3.3 Health Physics Program

The organization's health physics program to be in effect during decommissioning should be described. The program should include quality assurance provisions such as audits, inspections, or management reviews.

The criteria for selecting equipment and instrumentation for performing radiation and contamination surveys and personnel monitoring, including special instruments for detecting low levels of radiation, should be provided in this section; the types of instruments to be used should be described. The use, storage, calibration, testing, and maintenance for these instruments should be described. The purpose (e.g., personnel monitoring, radiation surveys), range, and sensitivity should be described for each type.

The policy, methods, frequency, and procedures for effluent monitoring, conducting radiation surveys, and personnel monitoring (including internal and external dosimetry systems) should also be described. The anticipated use of respiratory protection should be explained. Methods for contamination control should be described, including anticontamination clothing, control of access to restricted areas, and ventilation systems for containment of airborne radioactive contamination (including anticipated use of special and temporary ventilation systems). The program for determining airborne radioactivity in work areas such as locations of air samples, types of equipment, and frequency of sampling and analyses should be described.

If appropriate, changes may be made to an existing program. However, the decommissioning plan should clearly indicate the contents of the existing program and present the additional information described in this section.

In addition to the information developed in Section 3.1 regarding radiation levels present as a result of facility operations, the health physics program should identify potential sources of radiation or contamination exposure to workers or to the public that are generated by the decommissioning activities themselves. The licensee should specify how these potential sources will be controlled.

#### 3.4 Contractor Personnel

The licensee should describe radiation protection policies to ensure the safety of contractor personnel when they are working in restricted areas and the means of implementing these policies, in particular with regard to the policies described in Sections 3.2 and 3.3.

#### 3.5 Radioactive Waste Management

Processes and systems to be used for handling, storing, and disposing of radioactive waste should be described. The plan should show how the requirements of 10 CFR Part 61, Part 71, § 20.311 of Part 20, and applicable disposal site license conditions for processing and disposal of low-level radioactive wastes will be met. The plan should contain a projection of radioactive waste generation. This projection should include a detailed characterization of the wastes to be generated with projected volumes, radionuclide concentrations, waste forms and classification, and information on any significant quantities of special wastes such as chelates and mixed waste (i.e., mixed radioactive and hazardous wastes). If radioactive wastes are to be temporarily stored onsite, the quantities of waste, the expected length of storage, the location of storage areas, radiation levels at access points, and the manner in which positive control will be maintained should be described. If wastes from restricted areas are to be disposed of by land fill or similar methods, the means for demonstrating that criteria for release for unrestricted use are met should be specified

(see § 20.302 of 10 CFR Part 20). If mixed waste generation is anticipated, the effect on work procedures and the decommissioning schedule resulting from compliance with EPA requirements should be indicated.

References 1--5 contain information that may be useful in developing the information requested in this Section.

#### 4. PLANNED FINAL RADIATION SURVEY

The amended sections of the rule on decommissioning require that the decommissioning plan, if submitted, contain a description of the planned final radiation survey. This section describes the information that should be submitted to provide an adequate description of the survey procedure.

In this chapter, the licensee should describe the plan for demonstrating that the plant and site will meet criteria for release for unrestricted use. The final radiation survey plan should include (1) the proposed method for ensuring that all equipment, systems, structures, and the site are included in the survey (diagrams, plot plans, and layout drawings should be used to facilitate presentation) and that sufficient data is included for a meaningful statistical survey (additional guidance on survey methods is under development), (2) a description of and data on background radiation, (3) the type, specifications, and operating conditions of instruments to be used, and (4) methods to be used for reviewing, analyzing, and auditing data. The final radiation survey plan should demonstrate that a reasonable effort has been made to eliminate residual radioactive contamination. The licensee must explicitly describe the radiation and contamination levels expected upon release of the facility for unrestricted use and provide a justification if they are different from existing or accepted guidance. Licensees should obtain site decontamination criteria from appropriate NRC licensing staff.

#### 5. FUNDING

As discussed in Section 1 of the Introduction, the amended §§ 30.36, 40.42, and 70.38 contain requirements for decommissioning plans. Included in those sections is a requirement that the decommissioning plan contain the following: "An updated detailed cost estimate for decommissioning, comparison of that estimate with present funds set aside for decommissioning, and a plan for assuring the availability of adequate funds for completion of decommissioning." Certain licensees, in accordance with §§ 30.35, 40.36, and 70.25 of the amended rule. have already presented a cost estimate for purposes of establishing financial assurance for decommissioning; other licensees have presented a certification that the amounts prescribed in the rule have been provided for; while still other licensees have not been required to present any formal information to the NRC with regard to funding. (Explanation of funding provisions will be contained in separate regulatory guidance under development.) Licensees who have already submitted a cost estimate should present an updated cost estimate as part of the decommissioning plan, while licensees who had submitted either a certification or made no formal submittal must now submit a detailed cost estimate as part of their decommissioning plan. In all cases the estimates should be based on the detailed information submitted in Sections 2 through 4 of this plan. References 1, 2, and 3 contain information on decommissioning costs that

can be adapted to the individual case. More detailed guidance on preparing decommissioning cost estimates is being developed.

The licensee is to show how adequate funds for the completion of decommissioning will be made available. A comparison of the cost estimate made in this section with present funds is to be provided. If there is a deficit in present funding, the licensee should include a description of how sufficient funds for decommissioning will be made available. Guidance on acceptable funding methods is being developed.

# 6. PHYSICAL SECURITY PLAN AND MATERIAL CONTROL AND ACCOUNTING PLAN PROVISIONS IN PLACE DURING DECOMMISSIONING

If applicable, a description of and a schedule for any proposed changes to the NRC-approved physical security plan and special nuclear material control and accounting plan should be provided in this section. If not applicable, a notation to this effect should be entered in this section.

#### **IMPLEMENTATION**

The purpose of this section is to provide information to licensees regarding the NRC staff's plans for using this regulatory guide.

Except in those cases in which a licensee proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the guidance described in this guide will be used in the evaluation of decommissioning plans docketed after August 31, 1989, that are required by 10 CFR 30.36, 40.42, and 70.38.

#### REFERENCES

- 1. H. K. Elder and D. E. Blahnik, "Technology, Safety and Costs of Decommissioning a Reference Uranium Fuel Fabrication Plant," prepared for the Nuclear Regulatory Commission (NRC) by Pacific Northwest Laboratory (PNL), NUREG/CR-1266\* (PNL-3354), October 1980.
- 2. E. S. Murphy, "Technology, Safety and Costs of Decommissioning Reference Non-Fuel-Cycle Nuclear Facilities," prepared for the NRC by PNL, NUREG/CR-1754,\* February 1981, and Addendum 1,\*\* to be published.
- 3. H. K. Elder, "Technology, Safety and Costs of Decommissioning a Reference Uranium Hexafluoride Conversion Plant," prepared for the NRC by PNL, NUREG/CR-1757,\* October 1981.
- 4. H. K. Elder, "Technology, Safety and Costs of Decommissioning Nuclear Fuel Cycle Facilities, Classification of Decommissioning Wastes," prepared for the NRC by PNL, NUREG/CR-4519\* (PNL-5586), May 1986.
- 5. "Onsite Disposal of Radioactive Waste," U.S. Nuclear Regulatory Commission, NUREG-1101, November 1986.

<sup>\*</sup>Copies may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Post Office Box 37082, Washington, DC 20013-7082, or from the National Technical Information Service, Springfield, VA 22161.

<sup>\*\*</sup>Copies are available, under the decommissioning document file number 43 FR 10370, for inspection and copying for a fee at the Commission's Public Document Room, 2120 L Street NW., Washington, DC.

#### APPENDIX 1

# "U.S. NUCLEAR REGULATORY COMMISSION APPROVED BY OMB: 3150-0028 EXPIRES: 4/30/92 NRC FORM 314 (6-89) 10 CFR 30.36(d)(1)(iv) 10 CFR 40.42(d)(1)(iv) 10 CFR 70.38(d)(1)(iv) EXPINES: 4/30/92 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 5 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0028), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503. CERTIFICATE OF DISPOSITION OF MATERIALS INSTRUCTIONS: SEND THE COMPLETED CERTIFICATE TO THE NRC OFFICE SPECIFIED ON THE REVERSE. (All items MUST be completedprint or type) LICENSEE NAME AND ADDRESS LICENSE NUMBER LICENSE EXPIRATION DATE THE LICENSEE OR ANY INDIVIDUAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE LICENSEE CERTIFIES THAT: (Check end/or complete the appropriate item(s) below.) A. MATERIALS DATA (Check one and complete as necessary) 1. NO MATERIALS HAVE EVER BEEN PROCURED OR POSSESSED BY THE LICENSEE UNDER THIS LICENSE. OR 2. ALL MATERIALS PROCURED AND/OR POSSESSED BY THE LICENSEE UNDER THE LICENSE NUMBER CITED ABOVE HAVE BEEN DISPOSED OF IN THE FOLLOWING MANNER. (If additional space is needed, use the reverse side or provide attachments.) Describe specific material transfer actions and, if there were radioactive wastes generated in terminating this license, the disposal actions, including the disposition of low-level radioactive waste, mixed waste, Greater-than-Class-C waste, and sealed sources, if applicable For transfers, specify the date of the transfer, the name of the licensed recipient, and the recipient's NRC license number or Agreement State name and If materials were disposed of directly by the licensee rather than transferred to another licensee, licensed disposal site or waste contractor, describe the specific disposal procedures (e.g., decay in storage) B. OTHER DATA 1. OUR LICENSE HAS NOT YET EXPIRED; PLEASE TERMINATE IT. 2. WAS A RADIATION SURVEY CONDUCTED TO CONFIRM THE ABSENCE OF LICENSED RADIOACTIVE MATERIALS AND TO DETERMINE WHETHER ANY CONTAMINATION REMAINS ON THE PREMISES COVERED BY THE LICENSE? (Check one) NO (Attach explanation) YES, THE RESULTS (Check one) ARE ATTACHED, or WERE FORWARDED TO NRC ON (Date) 3. THE PERSON TO BE CONTACTED REGARDING THE INFORMATION PROVIDED ON THIS FORM TELEPHONE NUMBER 4. MAIL ALL FUTURE CORRESPONDENCE REGARDING THIS LICENSE TO CERTIFYING OFFICIAL I CERTIFY UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT. SIGNATURE DATE PRINTED NAME AND TITLE

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#### APPENDIX 1 (Continued)

#### FILE CERTIFICATES AS FOLLOWS

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#### VALUE/IMPACT STATEMENT

A draft value/impact statement was published with the draft of this guide when it was published for public comment (Task CE 304-4, December 1985). No changes were necessary, so a separate value/impact statement for the final guide has not been prepared. A copy of the draft value/impact statement is available for inspection or copying for a fee in the Commission's Public Document Room at 2120 L Street NW, Washington, DC, under Task CE 304-4.

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