August 12, 2010

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)		
	)	Docket Nos.	52-029-COL
Progress Energy Florida, Inc.	)		52-030-COL
	)		
(Combined License Application for	)		
Levy County Nuclear Plant, Units 1 and 2)	)	ASLBP No.	09-879-04-COL

MOTION FOR SUMMARY DISPOSITION OF CONTENTION 7 AS MOOT

I. INTRODUCTION

Pursuant to 10 C.F.R. § 2.1205, Progress Energy Florida, Inc. ("Progress"), hereby moves this Atomic Safety and Licensing Board (the "Board") for summary disposition of Contention 7, which alleges an omission from Progress's Combined Construction Permit and Operating License Application ("COLA") of an environmental analysis for long-term management of Class B and C low-level radioactive waste ("LLRW") at the proposed Levy County Nuclear Plant ("Levy"). Progress moves this Board to grant summary disposition of Contention 7 as moot, because the Nuclear Regulatory Commission ("NRC") Staff has provided such an environmental analysis in its Draft Environmental Impact Statement for Levy ("Levy DEIS") ("NUREG-1941")[1] relying on information provided to the Staff by Progress in response to a request for additional information. There is no longer a genuine dispute as to any fact material to Contention 7.

II. PROCEDURAL BACKGROUND

This proceeding involves the Levy COLA, submitted by Progress on July 28, 2008. Nuclear Information and Resource Service, the Ecology Party of Florida, and the Green Party of Florida (collectively, "Joint Intervenors") filed their Petition to Intervene and Request for Hearing ("Petition") on February 6, 2009, alleging several contentions. With regard to Contention 7, on July 8, 2009, the Board

[1] Available at ADAMS Accession Nos. ML102140231 & ML102140235.

found admissible only the "narrow issue" that the COLA's Environmental Report ("ER") fails to address the environmental impacts of on-site storage and management of LLRW for a potentially extended period of time.[2] Progress Energy Florida, Inc. (Levy County Nuclear Power Plant, Units 1 and 2), LBP-09-10, 70 N.R.C. 51, 121-25 (2009) ("LBP-09-10"). The Board found Contention 7 "inadmissible insofar as [it] raise[s] issues under 10 C.F.R. Part 61, or insofar as [it] constitute[s] a challenge to Table S-3 of 10 C.F.R. § 51.51." Id. at 121.

Progress appealed the Board's decision in LBP-09-10. With regard to Contention 7, the Commission affirmed in part and reversed in part, stating:

> With respect to the Staff's environmental review, the EIS must discuss the reasonably foreseeable environmental impacts of the proposed project. Absent a licensed LLRW disposal facility that will accept waste from the Levy County facility, it is reasonably foreseeable that LLRW generated by normal operations will be stored at the site for a longer term than is currently envisioned in Progress' COL application.

Progress Energy Florida, Inc. (Combined License Application, Levy County Nuclear Power Plant, Units 1 and 2), CLI-10-02, 71 N.R.C. __, slip op. at 24 (Jan. 7, 2010) (citations omitted). Furthermore, the Commission explicitly found that "the GTCC waste issue is outside the scope of this adjudicatory proceeding." Id. at 27. Thus the Commission further narrowed Contention 7 to omission of environmental impacts of storage of Class B and C LLRW, and excluded the impacts of GTCC LLRW. Id.

On August 5, 2010, the NRC Staff provided the omitted environmental analysis in its Levy DEIS. The NRC Staff's analysis reflects the responses to Requests for Additional Information ("RAI") Nos. 11.04-1 and 11.04-2 that Progress submitted on December 4, 2009. These responses, attached hereto as

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[2] As restated by the Board, Contention 7 as admitted states: Progress Energy Florida's (PEF's) application is inadequate because the Environmental Report assumes that the class B, C, and greater than C low-level radioactive waste (LLW) generated by proposed Levy Units 1 and 2 will be promptly (e.g., within two years) shipped offsite and fails to address the environmental impacts in the event that PEF will need to manage such LLW on the Levy site for a more extended period of time. LBP-09-10, 70 N.R.C. at 123.

Attachment A,[3] provide a contingency plan in the event that Progress will have to manage Class B and C LLRW at Levy for more than two years. The Levy DEIS concludes that (1) such management of LLRW at Levy would be very similar to the types and amounts of LLRW stored on-site for operating plants that was assessed in the Generic EIS for License Renewal ("NUREG-1437"); (2) radiation doses from interim LLRW storage are insignificant; and (3) long-term on-site LLRW management would result in public and occupational doses within regulatory limits and have a small environmental impact. NUREG-1941 at 6-14 to 6-15. As described in the Statement of Material Facts Not in Dispute (Attachment B), there are no material facts in dispute; therefore, the Board should grant summary disposition of Contention 7.

This Motion is timely as it meets both the absolute deadline and the timeliness trigger established by the Board for motions for summary disposition.

- This Motion is filed before March 17, 2011, the absolute deadline for motions for summary disposition established by the Board. Licensing Board Order (Revising Deadline for Motions for Summary Disposition of Environmental Matters) at 2 (Apr. 7, 2010) (unpublished).

- The Board established a timeliness trigger that "dispositive motions may be filed twenty (20) days after the occurrence or circumstance from which the motion arises … provided that the moving party commences sincere efforts to contact and consult all other parties with ten (10) days of the occurrence or circumstance." Progress Energy Florida, Inc. (Combined License Application for Levy County Nuclear Power Plant, Units 1 and 2), LBP-09-22, 70 N.R.C. __ , slip op. at 14-15, (Aug. 27, 2009) (emphasis in original) ("ISO"). The Board states that a motion for summary disposition is an example of a

[3] Attachment A was included in the supplemental disclosures that Progress made to the Parties on January 21, 2010. It was also Attachment A to the Joint Motion for Settlement of Contention 8 of April 14, 2010 approved by Licensing Board Order (Approving Settlement and Dismissal of Contention 8) (Apr. 21, 2010).

dispositive motion. Id. at 14. The Levy DEIS was first made available on August 5, 2010.[4] This Motion is filed within twenty (20) days of that date. Also, as discussed under "Certification" below, Progress initiated a sincere effort to contact and consult the other parties within ten (10) days of that date.

III. APPLICABLE LAW

A. WHEN AN APPLICANT CURES AN ALLEGED OMISSION IN THE APPLICATION WHICH SERVED AS THE BASIS FOR A CONTENTION, THE CONTENTION IS RENDERED MOOT

Where "a contention is 'superseded by the subsequent issuance of licensing-related documents'… the contention must be disposed of or modified." Duke Energy Corp. (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-28, 56 N.R.C. 373, 382 (2002) (footnote omitted). Where "a contention alleges the omission of particular information or an issue from an application, and the information is later supplied by the applicant . . . , the contention is moot." Id. at 383 (footnote omitted). See also Entergy Nuclear Vermont Yankee (Vermont Yankee Nuclear Power Station), LBP-05-24, 62 N.R.C. 429, 431-32 (2005). This information can be provided in responses to RAIs. See, e.g., Exelon Generation Co. (Early Site Permit for Clinton ESP Site), LBP-05-19, 62 N.R.C. 134, 149-50, 182 (2005). As discussed below, Contention 7 is moot.

B. WHEN NO GENUINE DISPUTE EXISTS REGARDING ANY FACT MATERIAL TO A CONTENTION, SUMMARY DISPOSITION IS APPROPRIATE

In a Subpart L proceeding, such as this one, the Board must apply the summary disposition standard set forth in Subpart G. See 10 C.F.R. § 2.1205(c). Under this standard, a moving party is entitled to summary disposition of a contention as a matter of law "if the filings in the proceeding … together with the statements of the parties and the affidavits, if any, show that there is no genuine issue as to any material fact." 10 C.F.R. § 2.710(d)(2); see also Carolina Power & Light Co. (Shearon Harris

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[4] See Letter from Scott C. Flanders, Director Division of Site and Environmental Reviews, NRR, to John Elnitsky, Progress Energy Vice President, Nuclear Plant Development (Aug. 5, 2010). This letter was forwarded to the Parties by the NRC Staff (Jody C. Martin) on that same date. See Attachment 1 to NRC 11th Status Report (Aug. 5, 2010) (ADAMS Accession No. ML102170528).

Nuclear Power Plant), CLI-01-11, 53 N.R.C. 370, 384 (2001); Advanced Medical Systems, Inc. (One Factory Row, Geneva, Ohio 44041) CLI-93-22, 38 N.R.C. 98, 102-03 (1993). With or without supporting affidavits, the movant is required to include a statement of material facts regarding which the movant contends that there is no genuine issue to be heard. See 10 C.F.R. § 2.710(a).

The movant for summary judgment bears the initial burden of showing the absence of a genuine dispute as to any material fact. Advanced Medical Systems, CLI-93-22, 38 N.R.C. at 102. "The opposing party must controvert any [individual] material fact properly set out in the statement of material facts that accompanies a summary disposition motion or the fact will be deemed admitted." Id. at 102-103 (footnote omitted). "[Opponents] have to present contrary evidence that is so significantly probative that it creates a material factual issue." Id. at 102 n.13, citing Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), CLI-92-8, 35 N.R.C. 145, 154 (1992)).

IV. THE BOARD SHOULD GRANT SUMMARY DISPOSITION OF CONTENTION 7 AS MOOT

A. The Levy DEIS, Relying on RAI Responses Submitted by Progress, Provides the Omitted Environmental Analysis

Contention 7, as admitted by the Board and revised by the Commission, alleges that Progress's ER failed to provide analysis of the environmental impact in the event that Progress will have to manage Class B and C LLRW at Levy for more than two years. LBP-09-10, 70 N.R.C. at 149-50. The Board properly characterized the admitted Contention 7 as a "contention of omission." Id. at 123. Relying on the information in Attachment A, the Levy DEIS sets forth the omitted analysis.

Progress's RAI responses describe the contingency plan for potential long-term storage of Class B and C LLRW. The last section of each response sets forth associated revisions to the Progress COLA. See Attachment A. These revisions address compliance with 10 C.F.R. Part 20 in the event that Progress will have to manage LLRW at Levy for more than two years. If appropriate, actions will be taken to

minimize waste generation to avoid the need for additional storage. In response to RAI No. 11.04-1, Progress identifies its plan for temporary storage of LLRW, stating:

> In the event that an offsite facility is not available to accept Class B and C waste, at least two years of storage is available within the facilities described in the DCD, considering routine operations and anticipated operational occurrences. In the event that an offsite facility is not available to accept Class B and C waste, a waste minimization plan will also be implemented. This plan will consider strategies to reduce generation of Class B and C waste, including reducing the in-service run length of resin beds, as well as resin selection, short-loading, and point-of-generation segregation techniques. Implementation of these techniques could substantially extend the capacity of the Class B and C storage within the facilities identified in the DCD. If additional storage capacity for Class B and C waste is required, further temporary storage would be developed in accordance with NUREG-0800, Standard Review Plan 11.4, Appendix 11.4-A; therefore, the design does not provide for the permanent on-site storage of radwaste.

Attachment A at 2. In the event such storage is needed, on-site temporary storage will be provided in accordance with the relevant NRC guidance for temporary LLRW storage. Attachment A at 3. Specifically, the Progress plan references NRC guidance that

> emphasizes safety considerations in the storing, handling, and eventual disposition of radioactive wastes … to ensure that container breaches will not occur during interim storage periods, or minimize the chance of such occurrences, and to preclude or reduce the likelihood of uncontrolled and unmonitored releases of radioactive wastes and materials from processing, handling, transportation, and storage accidents.

Standard Review Plan, NUREG-0800, Ch. 11.4 (Attachment C) at 11.4-12 to 11.4-13.

As discussed in Attachment B, the NRC Staff has analyzed the environmental impact of Progress's plan for managing LLRW for more than two years at the Levy site. The Levy DEIS concludes that, because the plan provides for compliance with 10 C.F.R. Part 20, the environmental impacts of long-term on-site storage of LLRW would be SMALL.

B. Contention 7 Has Been Rendered Moot

Where "a contention alleges the omission of particular information or an issue from an application, and the information is later supplied by the applicant … the contention is moot." McGuire, CLI-02-28, 56 N.R.C. at 383 (footnote omitted). As admitted by the Board and modified by the Commission, Contention 7 alleged that the Progress ER fails to analyze the environmental impacts in the

event that Progress will have to manage Class B and C LLRW at Levy for more than two years. In Attachment A, Progress provides a plan, which forms the basis for the Levy DEIS's conclusion that the environmental impacts of extended on-site storage and management of LLRW at Levy would be SMALL. This Board should grant summary disposition of Contention 7, because Attachment A and the Levy DEIS have rendered moot the dispute raised by the Contention. AmerGen Energy Co., LLC (License Renewal for Oyster Creek Nuclear Generating Station), CLI-08-28, 68 N.R.C. 658, 676 n.72 (2008); see also McGuire, CLI-02-28, 56 N.R.C. at 382-83.

While not precedential, other Boards have found moot similarly worded contentions regarding long-term storage of LLRW arising from the closure of Barnwell. Specifically, both the Calvert Cliffs and Fermi Boards granted summary disposition of contentions of omission related to environmental analysis of extended on-site storage of LLRW.

1. The Calvert Cliffs Board granted UniStar's summary disposition motion on a LLRW contention that was nearly identical to Contention 7. Calvert Cliffs Nuclear Project, LLC (Combined License Application for Calvert Cliffs Unit 3), Licensing Board Memorandum and Order (Ruling on Joint Intervenors' Proposed New Contentions 8 and 9 and Applicants' Motion for Summary Disposition of Contention 7) at 20 (Apr. 5, 2010) (unpublished). The Calvert Cliffs Board concluded that the LLRW contention was moot because UniStar submitted an ER revision acknowledging the partial closure of the Barnwell facility and explaining how UniStar will manage Class B and C waste given the lack of access to such a facility. Id. at 17-18. The same rationale applies to the plan submitted by Progress and analyzed in the Levy DEIS in this proceeding.

2. The Fermi Board granted Detroit Edison's summary disposition motion on a LLRW contention very similar to Contention 7. Detroit Edison Co. (Fermi Nuclear Power Plant, Unit 3), Licensing Board Memorandum and Order (Granting Motion for Summary Disposition of Contention 3) at 5-7 (July 9, 2010) (unpublished). The Fermi Board concluded that a Detroit Edison revision to its ER

acknowledged the closure of the Barnwell facility to generators in Michigan and explained "their plans for managing Class B and C wastes if an offsite facility is not available to accept such wastes. … The contention of omission the Board previously admitted has therefore become moot." Id. at 6. The same rationale applies to the plan submitted by Progress and analyzed in the Levy DEIS in this proceeding.

V. CONCLUSION

For the reasons stated above, the Board should grant Progress's Motion for Summary Disposition of Contention 7 as moot.

CERTIFICATION

I certify that this Motion is not interposed for delay, prohibited discovery, or any other improper purpose, that I believe in good faith that there is no genuine issue as to any material fact relating to this motion, and that the moving party is entitled to a decision as a matter of law, as required by 10 C.F.R. §§ 2.1205 and 2.710(d). Specifically, this Motion is filed well before the expected hearing date and is expected to lead to expediting the proceeding by resolving contested environmental issues associated with long-term on-site storage of LLRW at Levy. See 10 C.F.R. § 2.710(d)(1); ISO at 15 n. 30.

I certify that I have made a sincere effort to contact and did contact the other parties in this proceeding within ten days of the publication of the Levy DEIS, to explain to them the factual and legal issues raised in this Motion.. I certify that after consultations, the Joint Intervenors decided to take a position on this Motion after reading it and conferring with others. The NRC Staff agrees that the contention is moot and does not plan to file a response to this Motion.

Respectfully Submitted,
/Signed electronically by John H. O'Neill, Jr./
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Dated: August xx, 2010

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)		
	)	Docket Nos.	52-029-COL
Progress Energy Florida, Inc.	)		52-030-COL
	)		
(Combined License Application for	)		
Levy County Nuclear Plant, Units 1 and 2)	)	ASLBP No.	09-879-04-COL

CERTIFICATE OF SERVICE

I hereby certify that an electronic copy of the foregoing Motion for Summary Disposition of Contention 7 as Moot, dated August 12, 2010, was provided to the Electronic Information Exchange for service to those individuals on the service list in this proceeding this 12th day of August 2010.

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//signed electronically by Robert B. Haemer//
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Attachment A
Progress letter to NRC dated Dec. 4, 2009

Progress Energy

Serial: NPD-NRC-2009-241
December 4, 2009

10CFR52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

LEVY NUCLEAR PLANT, UNITS 1 AND 2
DOCKET NOS. 52-029 AND 52-030
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 073 RELATED TO SOLID WASTE MANAGEMENT SYSTEM

Reference: Letter from Donald Habib (NRC) to Garry Miller (PEF), dated November 4, 2009, "Request for Additional Information Letter No. 073 Related to SRP Section 11.4 for the Levy County Nuclear Plant, Units 1 and 2 Combined License Application"

Ladies and Gentlemen:

Progress Energy Florida, Inc. (PEF) hereby submits our response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in the referenced letter.

A response to the NRC request is addressed in the enclosure. The enclosure also identifies changes that will be made in a future revision of the Levy Nuclear Plant Units 1 and 2 application.

If you have any further questions, or need additional information, please contact Bob Kitchen at (919) 546-6992, or me at (727) 820-4481.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 4, 2009.

Sincerely,

John Elnitsky
Vice President
Nuclear Plant Development

Enclosure

cc : U.S. NRC Region II, Regional Administrator
Mr. Brian C. Anderson, U.S. NRC Project Manager

Progress Energy Florida, Inc.
P.O. Box 14042
St. Petersburg, FL 33733

Levy Nuclear Plant Units 1 and 2
Response to NRC Request for Additional Information Letter No. 073 Related to SRP Section 11.4 for the Combined License Application, dated November 4, 2009

NRC RAI #	Progress Energy RAI #	Progress Energy Response
11.04 -1	L-0678	Response enclosed – see following pages
11.04 -2	L-0679	Response enclosed – see following pages

NRC Letter No.: LNP-RAI-LTR-073

NRC Letter Date: November 4, 2009

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 11.04-1

Text of NRC RAI:

In Standard COL 11.4-1, the applicant states that "no additional onsite radwaste storage is required beyond that described in the DCD." Please explain why this statement is included or remove it.

PGN RAI ID #: L-0678

PGN Response to NRC RAI:

The referenced statement is provided to address the portion of the COL information item in DCD Subsection 11.4.6 that states "In the event additional onsite storage facilities are a part of Combined License plans, this program will include a discussion of conformance to Generic Letter GL-81-038" and the statement in Regulatory Guide 1.206 page C.III.1-137 "In the event that additional onsite storage facilities are part of COL plans, include a discussion of conformance to GL-81-038. Supplemental guidance is provided in SECY-94-198." The statement is intended to confirm that additional onsite storage facilities are <u>not</u> expected to be needed for LNP 1 & 2. Accordingly, the statement establishes that no discussion of permanent on-site storage facilities is necessary in the COL.

The statement in Standard COL 11.4-1 also clarifies that although the AP1000 design has provisions for the temporary storage of radwaste prior to shipment for disposal, such waste is normally promptly disposed of offsite at licensed processing and disposal facilities. In the event that an offsite facility is not available to accept Class B and C waste, at least two years of storage is available within the facilities described in the DCD, considering routine operations and anticipated operational occurrences. In the event that an offsite facility is not available to accept Class B and C waste, a waste minimization plan will also be implemented. This plan will consider strategies to reduce generation of Class B and C waste, including reducing the in-service run length of resin beds, as well as resin selection, short-loading, and point-of-generation segregation techniques. Implementation of these techniques could substantially extend the capacity of the Class B and C storage within the facilities identified in the DCD. If additional storage capacity for Class B and C waste is required, further temporary storage would be developed in accordance with NUREG-0800, Standard Review Plan 11.4, Appendix 11.4-A; therefore, the design does not provide for the permanent onsite storage of radwaste. Since there are no facilities currently licensed by the NRC for disposal of Greater Than Class C (GTCC) LLRW, storage of GTCC would be similar to the methodology used for storage of spent fuel.

As discussed above, LNP 1 & 2 plans to ship all processed or temporarily stored radwaste offsite for disposal; therefore, there is no anticipated need for additional onsite radwaste storage beyond the temporary storage described in the DCD. The referenced statement reflects the underlying analyses of radioactive sources and dose assessments, and assesses

the radiological impact of normal operation with conservative, bounding analyses. Progress Energy understands that LNP 1 & 2 will be licensed to operate within that licensing basis, which means that the accumulation of low-level radioactive waste in excess of the dose assessments is hypothetical at this time. To the extent that additional storage could be needed sometime in the future, the existing regulatory framework as described in NRC Regulatory Issue Summary 2008-32, Interim Low-Level Radioactive Waste Storage at Reactor Sites would allow Progress Energy to conduct written safety analyses under 10 C.F.R. § 50.59. If the additional storage does not satisfy 10 C.F.R. § 50.59, a license amendment would be required.

Associated LNP COL Application Revisions:

The following change will be made to the LNP FSAR in a future revision:

COLA Part 2, FSAR Chapter 11, Subsection 11.4.6 will be revised to add two new paragraphs at the end of STD COL 11.4-1:

Add the following at the end of STD COL 11.4-1 :

All packaged and stored radwaste will be shipped to offsite disposal/storage facilities and temporary storage of radwaste is only provided until routine offsite shipping can be performed. Accordingly, there is no expected need for permanent on-site storage facilities at LNP 1 & 2.

If additional storage capacity for Class B and C waste is required, further temporary storage would be developed in accordance with NUREG-0800, Standard Review Plan 11.4, Appendix 11.4-A. To the extent that additional storage could be needed sometime in the future, the existing regulatory framework would allow Progress Energy to conduct written safety analyses under 10 C.F.R. § 50.59. If the additional storage does not satisfy 10 C.F.R. § 50.59, a license amendment would be required.

Attachments/Enclosures:

None.

NRC Letter No.: LNP-RAI-LTR-073

NRC Letter Date: November 4, 2009

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 11.04-2

Text of NRC RAI:

In Section 11.4 of NUREG-1793, the staff states that if a need for onsite storage of low-level waste has been identified beyond that provided in AP1000 Standard Design because of unavailability of offsite storage, the applicant should submit the details of any proposed onsite storage facility to the NRC. Please provide any arrangements for offsite storage for low-level wastes or submit plans for onsite storage.

PGN RAI ID #: L-0679

PGN Response to NRC RAI:

Progress Energy currently employs agreements with offsite facilities for the disposal of radwaste from its operating nuclear plants. It is expected that these same or additional offsite facilities (current or future) would be utilized for radwaste from LNP Units 1 & 2. Currently, facilities are available in Texas and Utah for the disposal / storage of radwaste from LNP 1 & 2. LNP Units 1 & 2 are not scheduled to load fuel and begin operation for several years. Because the Low-Level Radioactive Waste Policy Amendments Act of 1985 requires that disposal capacity be available for all types of LLRW generated by Atomic Energy Act licensees, Progress Energy has confidence that disposal facilities will be available that would accept the Class A, B, and C waste generated by these plants when needed. Since there are no facilities currently licensed by the NRC for disposal of Greater Than Class C (GTCC) LLRW, storage of GTCC would be similar to the methodology used for storage of spent fuel.

In the event that off-site shipping is disrupted or facilities are not available to accept radwaste after LNP Units 1 & 2 become operational, as described in DCD Section 11.4.2.1 paragraph ten, temporary storage capability on-site is available for greater than two years at the expected rate of radwaste generation and greater than one year at the maximum rate of radwaste generation. During this period, the implementation of additional waste minimization strategies could extend the duration of temporary radwaste storage capability. The waste minimization strategy would include techniques to reduce generation of Class B and C waste such as reducing the in-service run length of resin beds, as well as resin selection, short loading, and point-of-generation segregation methods. If additional temporary radwaste storage is eventually needed, then on-site facilities could be constructed utilizing the design guidance provided in NUREG-0800, Standard Review Plan Chapter 11 Radioactive Waste Management Appendix 11.4-A, Design Guidance for Temporary Storage of Low-Level Radioactive Waste.

LNP Units 1 & 2 plans to ship all packaged and stored radwaste to offsite disposal or storage facilities. In the event disposal capacity is disrupted, Progress Energy would only temporarily store radwaste and would use off-site storage, if necessary, until routine disposal could be resumed.

Associated LNP COL Application Revisions:

The following change will be made to the LNP FSAR in a future revision:

COLA Part 2, FSAR Chapter 11, Subsection 11.4.2.4 will be revised to add a new subsection with the LMA of STD COL 11.4-2 to read:

Add the following after DCD Subsection 11.4.2.4.2:

11.4.2.4.3 Temporary Storage of Low-Level Radioactive Waste

In the event that off-site shipping is disrupted or facilities are not available to accept radwaste when LNP Units 1 & 2 become operational, as described in DCD Section 11.4.2.1 paragraph ten, temporary storage capability on-site is available for greater than two years at the expected rate of radwaste generation and greater than one year at the maximum rate of radwaste generation. During this period, the implementation of additional waste minimization strategies could extend the duration of temporary radwaste storage capability. Since there are no facilities currently licensed by the NRC for disposal of Greater Than Class C (GTCC) LLRW, storage of GTCC would be similar to the methodology used for storage of spent fuel.

If additional temporary radwaste storage is eventually required, then on-site facilities could be constructed utilizing the design guidance provided in NUREG-0800, Standard Review Plan Chapter 11 Radioactive Waste Management Appendix 11.4-A, Design Guidance for Temporary Storage of Low-Level Radioactive Waste.

Attachments/Enclosures:

None.

Attachment B
Statement of Material Facts Not in Dispute

Statement of Material Facts on Which No Genuine Issue Exists

Progress submits, in support of its Motion for Summary Disposition of Contention 7 as Moot, this Statement of Material Facts as to which Progress contends that there is no genuine dispute to be heard.

1. On July 28, 2008, Progress submitted a Combined Construction Permit and Operating License Application ("COLA") for two AP1000 units at the proposed Levy County Nuclear Plant ("Levy").

2. On February 6, 2009, Joint Intervenors filed their Petition to Intervene and Request for Hearing ("Petition"), including Contention 7 alleging "[a] substantial omission in Progress Energy Florida's (PEF) COL application to build and operate Levy County Nuclear Station Units 1 & 2 is the failure to address the absence of access to a licensed disposal facilities or capability to isolate the radioactive waste from the environment." Petition at 93.

3. In its Memorandum and Order of July 8, 2009, LBP-09-10, the Board admitted Contention 7 in part as follows:

> Progress Energy Florida's (PEF's) application is inadequate because the Environmental Report assumes that the class B, C, and greater than C low-level radioactive waste (LLW) generated by proposed Levy Units 1 and 2 will be promptly (e.g., within two years) shipped offsite and fails to address the environmental impacts in the event that PEF will need to manage such LLW on the Levy site for a more extended period of time.
>
> LBP-09-10, 70 N.R.C. at 123.

4. On January 7, 2010, the Nuclear Regulatory Commission ("NRC" or "Commission") affirmed in part and reversed in part, finding that "the GTCC waste issue is outside the scope of this adjudicatory proceeding" on a safety analysis for long-term management of Class B and C low-level radioactive waste ("LLRW"). CLI-10-02, slip op. at 27.

5. On December 4, 2009, Progress submitted responses to NRC RAI Nos. 11.04-1 and 11.04-2. ADAMS Accession No. ML093450353. (Attachment A).

Progress Describes Compliance with Radiation Controls Required by 10 C.F.R. Part 20

6. In response to RAI No. 11.04-1, Progress identifies its plan for temporary storage of LLRW, stating:

> In the event that an offsite facility is not available to accept Class B and C waste, at least two years of storage is available within the facilities described in the DCD, considering routine operations and anticipated operational occurrences. In the event that an offsite facility is not available to accept Class B and C waste, a waste minimization plan will also be implemented. This plan will consider strategies to reduce generation of Class B and C waste, including reducing the in-service run length of resin beds, as well as resin selection, short-loading, and point-of-generation segregation techniques. Implementation of these techniques could substantially extend the capacity of the Class B and C storage within the facilities identified in the DCD. If additional storage capacity for Class B and C waste is required, further temporary storage would be developed in accordance with NUREG-0800, Standard Review Plan 11.4, Appendix 11.4-A; therefore, the design does not provide for the permanent on-site storage of radwaste.

Attachment A at 2.

7. The revisions to the FSAR identified in response to RAI No. 11.04-1 add language to FSAR Chapter 11, Subsection 11.4.6. In pertinent part, it states:

> If additional storage capacity for Class B and C waste is required, further temporary storage would be developed in accordance with NUREG-0800, Standard Review Plan 11.4, Appendix 11.4-A. To the extent that additional storage could be needed sometime in the future, the existing regulatory framework would allow Progress Energy to conduct written safety analyses under 10 C.F.R. § 50.59. If the additional storage does not satisfy 10 C.F.R. § 50.59, a license amendment would be required.

Attachment A at 3.

8. Progress has provided a contingency plan for storage of Class B and C LLRW on the Levy site for greater than two years. Attachment A.

The NRC Staff Has Provided Analysis of the Environmental Impacts from Progress's Plan

9. The NRC Staff has addressed the potential environmental impacts from storage of LLRW at Levy under three scenarios: (1) storage of LLRW at the Levy on-site facility described in the COLA for no more than two years; (2) implementing measures at Levy to reduce or eliminate the generation of LLRW and extending the capacity of the Levy on-site facility described in the COLA for greater than two

years; and (3) construction of additional LLRW storage facilities on the Levy site designed and operated to meet the guidance in Appendix 11.4-A of the Standard Review Plan, NUREG-0800 (NRC 2007). The NRC Staff also notes that Progress could enter into an agreement with a third party contractor to process, store, own, and ultimately dispose of LLRW from Levy. Under any scenario, or a combination thereof, the NRC Staff finds the environmental impacts not significant or small. Levy DEIS, Ch. 6, 6-13 to 6-14.

10. The NRC Staff states that the Progress plan for long-term on-site storage of Class B and C LLRW results in calculated doses to members of the public that "would be below NRC and EPA standards and there would be no observable health impacts," and occupational doses to Levy plant workers "would be below NRC standards and [a] program to maintain doses ALARA [as low as reasonably achievable] would be implemented." The resulting environmental impacts were found by the NRC Staff to be SMALL. Levy DEIS, Ch. 5, Table 5-23 at 5-130.

11. The NRC Staff concludes that the environmental impact from radiation due to constructing and operating additional on-site LLRW storage facilities at Levy would be SMALL. Levy DEIS, Ch. 6, § 6.1.6 at 6-15.

12. The NRC Staff concludes that the small impact from radioactive waste storage, treatment, and disposal results in a small cost that it considers in the overall balance of costs and benefits of the proposed action. Levy DEIS, Ch. 10, Table 10-4 at 10-24.

Attachment C
Standard Review Plan, NUREG-0800, Chapter 11

U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

11.4 SOLID WASTE MANAGEMENT SYSTEM

REVIEW RESPONSIBILITIES

Primary - Organization responsible for the review of effectiveness of radwaste systems.

Secondary - Organizations responsible for the review of (1) radwaste system design and performance, and (2) solid waste materials.

I. AREAS OF REVIEW

The solid waste management system (SWMS) manages radioactive wastes, as liquid, wet, and dry solid wastes, produced during normal operation and anticipated operational occurrences. Review of the SWMS includes design features that are necessary for collecting, handling, processing, and storing wastes. This encompasses the design, design objectives, design criteria, treatment methods, and expected releases, including the description of the SWMS, mobile equipment connected to permanently installed systems, piping and instrumentation diagrams (P&IDs), process and effluent radiation monitoring and control instrumentation, and process flow diagrams showing the operational methods and factors that influence waste treatment. The review includes an evaluation of any additional equipment that may be necessary to process liquid, dry, and wet wastes and route them to the point of discharge from the SWMS or to prepare them for shipment to authorized offsite disposal sites or licensed radioactive waste processors.

The specific areas of review are as follows:

1. Design objectives in terms of expected and design volumes of liquid and wet wastes to be handled and processed (e.g., sludge, resins, filters, process concentrates, and

charcoal) and dry solid wastes and materials (e.g., high-efficiency particulate air (HEPA) filters, contaminated tools, equipment, plastics, glass, metals, rags, paper, and clothing), including expected radionuclide distributions and concentrations, chemicals, and mixed wastes (characterized by the presence of hazardous chemicals and radioactive materials). Expected waste volumes and radioactivity inventories to be shipped for disposal, shipped to waste processors for treatment and disposal, and returned to the radwaste system for further treatment or reuse.

2. Description of the SWMS; P&IDs; process and effluent radiation monitoring and control instrumentation; and process flow diagrams showing the methods of operation, including equipment design capacities, interconnections between plant subsystems (e.g., ventilation, service water, equipment drains) and mobile processing equipment, alternate processing methods, principal parameters assumed in the SWMS design and operation, and the use of such information for the development of the process control program (PCP).

3. Special design features and operational procedures to prevent, control, and collect releases of radioactive materials resulting from overflows from tanks containing liquids, sludge, spent resins, and the like, and measures to prevent the dropping of containers from cranes and forklifts. Corrosion-resistant properties of all system piping and valves associated with transfer lines to storage tanks and discharge piping buried in soils and concrete, including features designed for the early detection of leaks and spills (e.g., leak detection sumps and wells). Provisions and effectiveness of physical and monitoring precautions taken to minimize spills and leaks (e.g., retention basins, curbing, level gauges and alarms, catch containment, and self-sealing quick-disconnects) and measures to prevent interconnections with nonradioactive systems. Provisions for processing radioactive materials associated with the decontamination of leaks and spills and remediation of uncontrolled and unmonitored releases.

4. Description of the methods used for dewatering or stabilize (e.g., removal of free-standing water, encapsulation, solidification, etc.) wet wastes, types of stabilization media or agents, expected waste volume increase factors, and implementation of a PCP to ensure a solid matrix and proper waste form characteristics and/or complete dewatering of wet wastes.

5. Types and characteristics of filtration systems, ion-exchange resins, and adsorbent media to treat liquid and wet wastes, including expected removal efficiencies and decontamination factors.

6. Description of the methods used for volume reduction of dry solid wastes, including sorting methods, technologies (e.g., shredders, crushers, and compactors), system components and their design parameters, and expected waste volume reduction factors.

7. For plants using offgas treatment systems relying on charcoal beds, description of the process for regenerating spent charcoals for reuse and the facilities for storing spent charcoals before shipment for disposal or regeneration via third parties. Radiological and physical properties of spent charcoals. Provisions to manage and ship spent charcoals for disposal and estimates of the projected annual or periodic amounts of spent charcoals that will be disposed of as radioactive waste.

8. Fraction, if any, of all liquid, wet, and dry solid waste processing projected to be contracted out to waste brokers or specialized facilities. Disposition methods of wastes generated from such processing and whether processed wastes will be returned to the plant for later disposal or shipped directly by the processor to an authorized low-level radioactive waste disposal facility on behalf of the applicant.

9. Description of waste container types and sizes; filling and handling methods; spill and leak prevention features; procedures for monitoring for removable radioactive contamination and external radiation; and provisions for decontamination, packaging, and storage of containers.

10. Provisions for onsite waste storage before shipping, including expected design volumes; expected radionuclide concentrations and radioactivity inventories; layout of the packaging, storage, and shipping areas; use of cranes, forklifts, monorails, and similar equipment; storage capacity; fire protection; building ventilation; shielding provisions; expected onsite storage durations; and the design bases for these estimates.

11. Design considerations for the use of shielding around waste processing equipment expected to exhibit elevated levels of external radiation, placement of such equipment in shielded cubicles, and the use of temporary or permanent shielding mounted on or in the immediate vicinity of mobile equipment.

12. Quality group classifications of piping and equipment and the bases governing the classification chosen in accordance with Regulatory Guide 1.143 for wastes produced during normal operation and anticipated operational occurrences. Design, expected temperatures and pressures, and construction materials of permanently installed systems and mobile processing equipment.

13. Design provisions incorporated in equipment and facility to facilitate operation and maintenance in accordance with Regulatory Guide 1.143 and as referenced in topical reports, as well as previous experience with similar equipment and methods referenced in the safety analysis report (SAR) or other supporting documents, as they relate to wastes produced during normal operation and anticipated operational occurrences.

14. Design features to reduce volumes of liquid, wet, and dry wastes handled by the SWMS; reduce radioactivity levels in wastes; minimize, to the extent practicable, contamination of the facility and environment; facilitate eventual decommissioning; and minimize, to the extent practicable, the generation of radioactive waste.

15. For multiunit stations, descriptions and design features of equipment and components (as permanently installed systems or in combination with mobile processing equipment) normally shared between interconnected processing and treatment subsystems.

16. Definition of the boundary of the SWMS, beginning at the interface from plant systems provided for the collection of process streams and radioactive wastes to the point of controlled discharges to the environment, as defined in the PCP and/or Offsite Dose Calculation Manual (ODCM), at the point of recycling to primary or secondary water system storage tanks, or to within plant facilities used for the storage of radioactive wastes and mixed wastes in accordance with Regulatory Guide 1.143 for wastes produced during normal operation and anticipated operational occurrences.

17. Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC). For design certification (DC) and combined license (COL) reviews, the staff reviews the applicant's proposed ITAAC associated with the structures, systems, and components (SSCs) related to this SRP section in accordance with SRP Section 14.3, "Inspections, Tests, Analyses, and Acceptance Criteria." The staff recognizes that the review of ITAAC cannot be completed until after the rest of this portion of the application has been reviewed against acceptance criteria contained in this SRP section. Furthermore, the staff reviews the ITAAC to ensure that all SSCs in this area of review are identified and addressed as appropriate in accordance with SRP Section 14.3.

18. COL Action Items and Certification Requirements and Restrictions. For a DC application, the review will also address COL action items and requirements and restrictions (e.g., interface requirements and site parameters).

    For a COL application referencing a DC, a COL applicant must address COL action items (referred to as COL license information in certain DCs) included in the referenced DC. Additionally, a COL applicant must address requirements and restrictions (e.g., interface requirements and site parameters) included in the referenced DC.

19. Operational Program Description and Implementation. For a COL application, the staff reviews the Process Control Program (PCP) aspect of the Process and Effluent Monitoring and Sampling Program description and the proposed implementation milestones. The staff also reviews final safety analysis report (FSAR) Table 13.x to ensure that the PCP aspect of the Process and Effluent Monitoring and Sampling Program and associated milestones are included.

Review Interfaces

Other SRP sections interface with this section as follows:

1. Review of the SWMS and waste storage facilities given the use or presence of flammable materials is performed under SRP Section 9.5.1.

2. Review of the acceptability of the design analyses, procedures, and criteria used to establish the ability of Seismic Category I structures housing the system and supporting systems to withstand the effects of natural phenomena, such as the safe-shutdown earthquake, the probable maximum flood, and tornadoes and tornado missiles, is performed under SRP Sections 3.3.1, 3.3.2, 3.4.2, 3.5.3, 3.7.1 through 3.7.4, 3.8.4, and 3.8.5.

3. Review of the acceptability of the seismic and quality group classifications for structures and system components is performed under SRP Sections 3.2.1 and 3.2.2.

4. Review of technical specifications (TS) is performed under SRP Section 16.0.

5. Review of quality assurance is performed under SRP Chapter 17.

6. Review of a consequence of a liquid or wet waste tank failure with the potential of releasing radioactive materials to outdoor areas and a potable water supply is conducted under SRP Sections 11.2 and Branch Technical Position (BTP) 11-6.

7. If not included in the review of SRP Sections 11.2 and 11.3, an evaluation of the design features of building exhaust and ventilation systems servicing areas where liquid, wet, and solid wastes are processed and stored (e.g., use of HEPA and charcoal filters) is conducted under SRP Section 9.4 and, for instrumentation used to monitor and control radioactive effluent releases, under SRP Section 11.5.

8. Review of the SWMS design provisions incorporated to control, sample, and monitor radioactive materials in liquid, wet, and solid waste process and effluent streams is performed under SRP Section 11.5.

9. Review of design features of the SWMS process and post-accident sampling subsystems is conducted under SRP Sections 9.3.2 and 11.5.

10. Review of design features for the protection of potable and sanitary water systems is conducted under SRP Section 9.2.4.

11. Review of the Standard Radiological Effluent Controls (SREC) and ODCM, as they relate to elements of the PCP, is conducted under SRP Section 11.5.

12. If not included in the review of SRP Sections 11.2 and 11.3, an evaluation of source terms and dose calculations is conducted to assess the performance of the SWMS against the NRC's requirements set forth in 10 CFR 20.1302 and 10 CFR 20.1301(e), Table 2 of Appendix B to 10 CFR Part 20, and the dose objectives of Appendix I to 10 CFR Part 50, based on information in SRP Sections 11.1 and 11.4.

13. Review of the "as low as reasonably achievable" (ALARA) provisions in system design and operation to assure compliance with the occupational dose limits of 10 CFR 20.1201 and 10 CFR 20.1202 and Table 1 of Appendix B to 10 CFR Part 20 is conducted under SRP Chapter 12.

14. For COL reviews of operational programs, the review of the applicant's implementation plan is performed under SRP Section 13.4, "Operational Programs."

The specific acceptance criteria and review procedures are contained in the referenced SRP sections.

II. ACCEPTANCE CRITERIA

Requirements

Acceptance criteria are based on meeting the relevant requirements of the following Commission regulations:

1. 10 CFR 20.1302 and 10 CFR 20.1301(e), as they relate to radioactive materials released in gaseous and liquid effluents to unrestricted areas. These criteria apply to releases resulting from SWMS operation during normal plant operations and anticipated operational occurrences.

2. 10 CFR 20.1406, as it relates to the design and operational procedures (for applications other than license renewals, after August 20, 1997) for minimizing contamination, facilitating eventual decommissioning, and minimizing the generation of radioactive waste.

3. 10 CFR 50.34a, as it relates to the provision of sufficient information to demonstrate that design objectives for equipment necessary to control releases of radioactive effluents to the unrestricted areas are kept as low as reasonably achievable.

4. 10 CFR Part 50, Appendix I, Sections II.A, II.B, II.C, and II.D, as they relate to the numerical guides for dose design objectives and limiting conditions for operation to meet the ALARA criterion.

5. 40 CFR Part 190 (the U.S. Environmental Protection Agency (EPA), generally applicable environmental radiation standards, as implemented under 10 CFR 20.1301(e)), as it relates to limits on total annual doses from all sources of radioactivity and radiation from the site (with single or multiple units).

6. Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 60, as it relates to the design of the SWMS to control the release of radioactive materials in liquid effluents from the SWMS and to handle solid wastes produced during normal plant operation, including anticipated operational occurrences.

7. GDC 61, as it relates to the ability of systems that may contain radioactivity to assure adequate safety under normal and postulated accident conditions.

8. GDC 63, as it relates to the ability of the SWMS to detect conditions that may result in excessive radiation levels and to initiate appropriate safety actions.

9. 10 CFR 61.55 and 10 CFR 61.56, as they relate to classifying, processing, and disposing of dry solid and wet wastes at approved low-level radioactive waste disposal sites.

10. 10 CFR 20.2006 and Appendix G to 10 CFR Part 20, as they relate to the requirements for transferring and manifesting radioactive materials shipments to authorized facilities (e.g., disposal sites, waste processors).

11. 10 CFR 20.2007, as it relates to compliance with other applicable Federal, State, and local regulations governing any other toxic or hazardous properties of radioactive wastes, such as mixed wastes characterized by the presence of hazardous chemicals and radioactive materials, that may be disposed under 10 CFR Part 20.

12. 10 CFR 20.2108, as it relates to the maintenance of waste disposal records until the NRC terminates the pertinent license requirements.

13. 10 CFR Part 71 and 49 CFR Parts 171–180, as they relate to the use of approved containers and packaging methods for the shipment of radioactive materials.

14. 49 CFR 173.443, as it relates to methods and procedures used to monitor for the presence of removable contamination on shipping containers, and 49 CFR 173.441, as it relates to methods and procedures used to monitor external radiation levels for shipping containers and vehicles.

15. 10 CFR 52.47(b)(1), which requires that a DC application contain the proposed inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design

certification is built and will operate in accordance with the design certification, the provisions of the Atomic Energy Act, and the NRC's regulations;

16. 10 CFR 52.80(a), which requires that a COL application contain the proposed inspections, tests, and analyses, including those applicable to emergency planning, that the licensee shall perform, and the acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, the facility has been constructed and will operate in conformity with the combined license, the provisions of the Atomic Energy Act, and the NRC's regulations.

SRP Acceptance Criteria

Specific SRP acceptance criteria acceptable to meet the relevant requirements of the NRC's regulations identified above are as follows for the review described in this SRP section. The SRP is not a substitute for the NRC's regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with the NRC regulations.

1. The SWMS design parameters are based on expected radionuclide distributions and concentrations consistent with reactor operating experience for similar designs, as evaluated under SRP Section 11.1.

2. Processing equipment is sized to handle the design SWMS inputs, that is, the types of liquid, wet, and solid wastes; radionuclide distributions and concentrations; radionuclide removal efficiencies and decontamination factors; waste volume reduction and increase factors; waste volumes; and waste generation rates.

3. All liquid and wet wastes will be stabilized in accordance with a PCP before offsite shipment, or provisions will be made to verify the absence of free liquid in each container and procedures to reprocess containers in which free liquid is detected in accordance with the requirements of Branch Technical Position (BTP) 11-3.

4. Other forms of wet wastes will be stabilized or dewatered (subject to the licensed disposal facility's waste acceptance criteria) in accordance with a PCP, or provisions will be made to verify the absence of free liquid in each container and procedures to reprocess containers in which excess water is detected in accordance with the requirements of BTP 11-3.

5. SWMS design objectives, design criteria, treatment methods, expected effluent releases, process and effluent radiation monitoring and control instrumentation, and methods for establishing process and effluent instrumentation control set points, as they relate to the PCP and ODCM under this SRP Section and SRP Section 11.5.

6. Waste containers, shipping casks, and methods of packaging wastes meet all applicable Federal regulations (e.g., 10 CFR Part 71, addressing the packaging and transportation of radioactive materials; 10 CFR 20.2006 and Appendix G to 10 CFR Part 20, addressing the transfer and manifesting of radioactive waste shipments; and 49 CFR Parts 171–180, addressing U.S. Department of Transportation (DOT) regulations for the shipment of radioactive materials); and 10 CFR Part 61 or

corresponding State regulations addressing applicable waste acceptance criteria of the disposal facility or waste processors.

7. Onsite waste storage facilities provide sufficient storage capacity to allow time for shorter lived radionuclides to decay before shipping in accordance with the requirements of BTP 11-3. The SAR should give the bases for determining the duration of the storage.

8. SWMS components and piping systems, as well as structures housing SWMS components, are designed in accordance with the provisions of Regulatory Guide 1.143, as it relates to the seismic design and quality group classification of components, and BTP 11-3 for wastes produced during normal operation and anticipated operational occurrences.

9. The SWMS contains provisions to reduce leakage and facilitate operations and maintenance in accordance with the provisions of Regulatory Guide 1.143 and BTP 11-3, as they relate to wastes produced during normal operation and anticipated operational occurrences.

10. For long-term onsite storage (e.g., for several years, but within the operational life of the plant), the storage facility should be designed to the guidelines of Appendix 11.4-A to this SRP section, including updated guidance from SECY 93-323 and SECY 94-198.

11. Liquid, wet, and dry solid wastes will be processed and disposed of in accordance with 10 CFR 61.55 and 10 CFR 61.56 requirements for waste classification and characteristics and with the waste acceptance criteria of the chosen licensed radioactive waste disposal site. The PCP should present the process and methods used to meet these 10 CFR Part 61 requirements.

12. Mixed wastes (characterized by the presence of hazardous chemicals and radioactive materials) will be processed and disposed in accordance with 10 CFR 20.2007, as it relates to compliance with other applicable Federal, State, and local regulations governing any other toxic or hazardous properties of radioactive wastes.

13. All effluent releases (gaseous and liquid) associated with the operation (normal and anticipated operational occurrences) of the SWMS will comply with 10 CFR Part 20 and Regulatory Guide 1.143, as they relate to the definition of the boundary of the SWMS beginning at the interface from plant systems, including multiunit stations, to the points of controlled liquid and gaseous effluent discharges to the environment or designated onsite storage locations, as defined in the PCP and ODCM.

14. Operational Programs. For COL reviews, the description of the operational program and proposed implementation milestone for the PCP aspect of the Process and Effluent Monitoring and Sampling Program are reviewed in accordance with 10 CFR 20.1301 and 20.13.2, 10 CFR 50.34a, 10 CFR 50.36a, and 10 CFR 50, Appendix I, section II and IV. Its implementation is required by a license condition.

Technical Rationale

The technical rationale for application of these acceptance criteria to the areas of review addressed by this SRP section is discussed in the following paragraphs:

1. 10 CFR 20.1302 requires that surveys of radiation levels in unrestricted areas be performed to demonstrate system compliance with the 10 CFR 20.1301 dose limits to individual members of the public. 10 CFR 20.1302 identifies two approaches, either of which can demonstrate compliance with the 10 CFR 20.1301 dose limits. One of these approaches requires the following:

   A. Demonstrate that the annual average concentrations of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the specified in Table 2 of Appendix B to 10 CFR Part 20; and

   B. Demonstrate that the annual and hourly doses from external sources to an individual continuously present in an unrestricted area will not exceed 0.5 millisievert (mSv) (0.05 rem) and 0.02 mSv (0.002 rem), respectively.

   Meeting the above requirements provides assurance that the 10 CFR 20.1301dose limits to individual members of the public will not be exceeded. The review in this SRP section will include an evaluation of whether the above-identified dose requirements are met. Meeting the requirements on gaseous and liquid effluent concentration limits in unrestricted areas from all plant sources of radioactivity (including that associated with the operation of the SWMS) is identified as an acceptance criterion in SRP Sections 11.2 and 11.3 and will be evaluated in those SRP sections as well.

2. Meeting the requirements of 10 CFR 50.34a, as it relates to adequate design information on the SWMS, provides a level of assurance that the SWMS will have the necessary equipment and design features to control radioactive effluent releases to the environment resulting from its operation, in accordance with the requirements of 10 CFR 20.1302, Appendix I to 10 CFR Part 50, and GDC 60 and 61.

   The review should evaluate the types and characteristics of filtration systems, ion-exchange resins, and adsorbent and stabilization media proposed to treat liquid and wet wastes. This includes removal efficiencies, decontamination factors, waste volume increase factors for stabilized wastes, and volume decrease factors for compacted wastes, taking into account the expected physical, chemical, and radiological properties of process waste and effluent streams. The review should determine whether performance meets or exceeds that noted in NRC guidance, standard DCs, industry standards, or topical reports. The NRC guidance includes NUREG-0016 or NUREG-0017 and Regulatory Guide 1.112, as they relate to the use of acceptable methods for calculating radionuclide concentrations in process streams and annual effluent releases, and Regulatory Guide 1.110, as it relates to performing cost-benefit analysis in reducing cumulative population doses by using available technology.

3. GDC 60, requires that the nuclear power unit design include provisions to handle radioactive wastes produced during normal reactor operation, including anticipated operational occurrences.

   GDC 60 specifies that the SWMS must provide for a holdup capacity sufficient to retain radioactive wastes, particularly where unfavorable site environmental conditions may impose unusual operational limitations on the release of effluents. Waste processing holdup times and long-term storage capacity also provide decay time for shorter-lived radionuclides before they are processed further or released to the environment. The holdup times are used in the source term calculations, employing the methods described in NUREG-0016 or NUREG-0017 and Regulatory Guide 1.112.

Meeting the requirement of GDC 60 provides assurance that releases of radioactive materials in liquid and gaseous effluents to unrestricted areas during normal plant operation and during anticipated operational occurrences of the SWMS will not result in offsite radiation doses exceeding the dose objectives specified in Appendix I to 10 CFR Part 50 or concentrations of radioactive materials in liquid effluents in any unrestricted area exceeding the limits specified in Table 2, Column 2, of Appendix B to 10 CFR Part 20. Meeting the requirement of GDC 60 provides a level of assurance that the resulting wastes produced from the SWMS will meet the requirements of 10 CFR 61.55 and 10 CFR 61.56 for waste classification and characteristics and DOT shipping regulations under 49 CFR Parts 171–180.

4. GDC 61 requires that systems that may contain radioactivity shall be designed to assure adequate safety under normal and postulated accident conditions.

   Compliance with GDC 61 requires that the SWMS and other systems (as permanently installed systems or in combination with mobile systems) that may contain radioactivity shall be designed to ensure adequate safety under normal and postulated accident conditions. This criterion specifies that the design of such facilities' shall enable inspection and testing of components important to safety and with suitable shielding for radiation protection.

   SRP Section 11.4 and Regulatory Guide 1.143 describe staff positions related to the design of the SWMS, including provisions for equipment to be used to prevent and contain spillage while pumping, filling, pouring, and overfilling waste containers or system tanks and features to contain the contents of resin storage tanks in the event of subsystem failures. Regulatory Guide 1.143 furnishes design guidance acceptable to the NRC's staff on seismic and quality group classification and quality assurance provisions for the SWMS subsystems, structures, and components, as they relate to wastes produced during normal operation and anticipated operational occurrences.

   Meeting the requirement of GDC 61 provides assurance that releases of radioactive materials during normal operation and anticipated operational occurrences, including adverse conditions on system components, will not result in radiation doses that exceed the 10 CFR Part 20 limits. In addition, meeting this requirement will help ensure that the SWMS will continue to perform its safety function(s) under postulated accident conditions.

5. GDC 63 requires that radioactive waste systems be able to detect conditions that may result in excessive radiation levels in waste storage locations and to initiate appropriate safety actions.

   Meeting the requirements of GDC 63 will provide a level of assurance that the SWMS will be equipped with monitoring and detection capabilities to facilitate the initiation of timely corrective actions. It will also ensure that effluent concentrations in unrestricted areas arising from SWMS operation do not exceed the limits for effluents specified in Table 2 of Appendix B to 10 CFR Part 20 and that radiation exposures to occupational workers do not exceed the occupational dose limits of 10 CFR 20.1201 and 10 CFR 20.1202 and Table 1 of Appendix B to 10 CFR Part 20. The review on occupational exposures is conducted under SRP Section 12.0.

6. 10 CFR Part 61 establishes, for land disposal of radioactive waste, the procedures, criteria, and terms and conditions for the disposal of radioactive wastes containing byproduct, source, and other special nuclear material. State and local regulations also apply to the licensing of land disposal facilities.

   The SWMS processes liquid, wet, and dry solid wastes for shipment to a licensed disposal facility. For the SWMS, 10 CFR 61.55 and 10 CFR 61.56 require the inclusion of provisions in the system design and PCP that describe the dewatering and stabilization processes and the classification, processing, and disposition of solid wastes. The SWMS and PCP should also address the criteria that the different waste classes should satisfy and the various characteristics that the processed liquid wet wastes should satisfy. Item 7 of this SRP subsection outlines the technical and procedural elements that the PCP should address and identifies related NRC guidance.

   Meeting the requirements of 10 CFR 61.55 and 10 CFR 61.56 provides a level of assurance that radioactive wastes processed by the SWMS have been properly classified such that controls and resulting waste forms are effective and that the processed waste, when stabilized as required, will not structurally degrade and will be compatible with the disposal site's waste acceptance criteria and the 10 CFR Part 61 requirements. The maximum radionuclide concentrations allowable for land disposal are defined by 10 CFR 61.55 for Class A, B, and C wastes.

7. In the context of 10 CFR Part 61, radioactive wastes shipped to disposal facilities must comply with the requirements addressing waste classifications and characteristics and the shipping regulations under 10 CFR Part 71 and 49 CFR Parts 171–180.

   Plant TS require that a PCP be established to provide reasonable assurance of the complete stabilization of process wastes and the absence of free water in process wastes. The PCP and operational procedures should describe, given specific waste-processing technologies and methods, a set of process parameters that are used to process wastes. Among others, the parameters include pH, water content, oil content, presence of hazardous materials, content of chelating agents, and ratio of stabilization agent to chemical additives by types of wastes. The types of wastes may include filter sludge, spent resins, boric acid solutions, process concentrates, and filter media. The PCP should describe the bases in developing waste mixture formulas, sampling, analysis, tests, radionuclide scaling factors, encapsulation and concentration averaging, controls on radiolytic hydrogen gas generation, and methods to demonstrate that the processing of actual or simulated waste samples can be successfully accomplished and ensure compliance with the requirements of 10 CFR 61.55 and 10 CFR 61.56 for waste classification and characteristics; characterizations of waste in shipping manifests in accordance with 10 CFR 20.2006; compliance with 10 CFR 20.2007, as it relates to other applicable Federal, State, and local regulations governing the presence of any other toxic or hazardous materials in waste; conformance with NRC and DOT shipping regulations under 10 CFR Part 71 and 49 CFR Parts 171–180; and compliance with waste acceptance criteria of authorized disposal facilities or waste processors.

   The PCP should identify surveillance requirements consistent with the plant's TS, administrative procedures, operational procedures, operation of the process and effluent radiation monitoring and control instrumentation and procedures for setting instrumentation alarm set points, quality assurance and quality control, radiological controls and monitoring, information to be contained in annual radiological effluent

release reports, reporting requirements to the NRC, instructions on the use of the NRC's uniform radioactive shipping waste manifest, and the process for initiating and documenting changes to the PCP and its supporting procedures.

Related guidance may be found in NUREG-1301 for pressurized-water reactors (PWRs) or NUREG-1302 for boiling-water reactors (BWRs), NUREG-0133, and NUREG/BR-0204. Specific guidance on waste form, characterization, and classification is listed in Inspection Procedure 84850; "Issuance Final Branch Technical Position on Concentration Averaging and Encapsulation," dated January 17, 1995; "Final Waste Classification and Waste Form Technical Position Papers," dated May 11, 1983; "Revised Staff Technical Position on Waste Form (SP-91-13)," dated January 30, 1991; and IE Information Notice No. 86-20, dated March 28, 1986, on methodologies used to develop waste-scaling factors. IE Bulletin No. 79-19 and IE Information Notice Nos. 84-72, 85-92, 87-07, and 90-31 present illustrative examples of issues associated with some operational aspects of the PCP.

8. 10 CFR Part 71 establishes requirements for packaging, preparation for shipment, and transportation of licensed material and procedures and standards for packaging and shipping of fissile material or quantities of other licensed materials in excess of Type A quantities, and it defines the applicability of 10 CFR Part 71 to waste generators and common carriers. Regarding allowable external radiation levels and residual surface contamination on external surfaces of shipping containers and packages, 10 CFR Part 71 presents criteria and also refers to DOT shipping regulations under Subpart I (Class 7) of 49 CFR Part 173.

   Meeting the requirements of 10 CFR Part 71 provides a level of assurance that the operation of the SWMS and development of the PCP with regard to packaging, preparation for shipment, qualification of the packaging material, testing of the package, exemptions, quality control and procedures, and transportation of licensed radioactive materials will not result in an undue risk to the public.

9. BTP 11-3 presents guidance on SWMS design guidelines and operation, addressing process parameters, waste stabilization or dewatering, waste form properties, free liquid detection, quality assurance, waste storage, and portable solid waste systems.

   The BTP focuses primarily on wet and liquid wastes for the purpose of ensuring complete stabilization and dewatering. For dry wastes, it emphasizes the use of waste volume reduction technologies for minimizing the amounts of wastes shipped to land disposal facilities. Generic Letter Nos. 80-009, 81-038, and 81-039 provide further guidance.

   Meeting the guidelines of BTP 11-3 provides a level of assurance that the SWMS, as implemented under the PCP, includes the necessary equipment, processes, and procedures to satisfactorily process, monitor, store for decay, and provide storage facilities for radioactive wastes before shipment for offsite disposal or further processing by waste processors.

10. Appendix 11.4-A addresses the long-term storage of wet, stabilized, and dry solid wastes.

    Appendix 11.4-A provides guidance for applicants when considering onsite low-level radioactive waste storage capabilities for periods that may last several years but are

significantly less than the life of the plant. The guidance emphasizes safety considerations in the storing, handling, and eventual disposition of radioactive wastes under 10 CFR Part 61 or equivalent State regulations. Generic Letter Nos. 80-009, 81-038, and 81-039, and SECY 94-198 and SECY 93-323 contain further guidance.

Meeting the guidelines of Appendix 11.4-A provides a level of assurance that the SWMS, as implemented under the PCP, will meet the associated requirements of the NRC's regulations (10 CFR Part 20 and 10 CFR Part 71) and DOT shipping regulations (49 CFR Parts 171–180) to ensure that container breaches will not occur during interim storage periods, or minimize the chance of such occurrences, and to preclude or reduce the likelihood of uncontrolled and unmonitored releases of radioactive wastes and materials from processing, handling, transportation, and storage accidents.

11. 10 CFR 20.1406 requires that applicants describe how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment; facilitate eventual decommissioning; and minimize, to the extent practicable, the generation of radioactive waste. Regulatory Guide 1.143 presents criteria for SSCs outside containment that contain radioactive wastes produced during normal operation and anticipated operational occurrences..

    Specific guidance to meet the 10 CFR 20.1406 requirements is listed below:

    A. SWMS processing systems (either as permanently installed systems or in combination with mobile equipment) with a potential for leakage shall provide means to control and contain this leakage to prevent contamination of building floors and interconnected systems (e.g., curbing, floor sloping to local drains, floor-to-floor seals over floor expansion joints, wall-to-floor joint seals, sheathed hoses, drip pans or containment boxes, backflow preventers, siphon breakers, self-sealing quick-disconnects, and operational interlocks). See guidance given in relevant NRC bulletins and circulars (e.g., IE Bulletin Nos. 79-19 and 80-10; IE Circular Nos. 77-10, 77-14, 79-07, 79-09, 79-21, and 81-09; and IE Information Notice Nos. 84-72, 85-92, 87-07, and 90-31).

    B. In facilitating decommissioning, designs should minimize, to the extent practicable, embedding contaminated piping in concrete, consistent with maintaining radiation doses ALARA during operations and decommissioning.

    C. To minimize waste generation, provisions should be in place to clean contaminated materials (e.g., system components and equipment) and regenerate or reuse resin beds as applicable (e.g., demineralizer resin beds with some remaining ion-exchange capacity when feasible), as opposed to premature disposal.

    D. Mobile liquid waste processing systems with interconnections to permanently installed plant SWMS subsystems should include provisions that avoid the contamination of nonradioactive systems, prevent uncontrolled and unmonitored releases of radioactive materials in the environment, and avoid interconnections with potable and sanitary water systems.

    E. All temporary and flexible lines (as hoses and connections), system piping embedded in concrete, and effluent discharge lines or piping buried in soils should undergo pressure testing. All system piping and valves associated with

transfer lines to storage tanks and discharge piping buried in soils and concrete, including features designed for the early detection of leaks and spills (e.g., leak detection sumps and wells), should have corrosion-resistant properties. See Regulatory Guide 1.143 for wastes produced during normal operation and anticipated operational occurrences.

F. Further guidance is found in Memorandum from Larry W. Camper to David B. Matthews and Elmo E. Collins, dated October 10, 2006, "List of Decommissioning Lessons Learned in Support of the Development of a Standard Review Plan for New Reactor Licensing" (ADAMS Accession No. ML0619201830); and NUREG/CR-3587, "Identification and Evaluation of Facility Techniques for Decommissioning of Light Water Reactors," and "Liquid Radioactive Release Lessons Learned Task Force, Final Report," Sections 2.0 and 3.2.2, dated September 1, 2006 (ADAMS Accession No. ML062650312).

12. 10 CFR 20.1301(e) requires that NRC-licensed facilities comply with the EPA generally applicable environmental radiation standards of 40 CFR Part 190 for facilities that are part of the fuel cycle. The EPA annual dose limits are 0.25 mSv (25 millirem (mrem)) to the whole body, 0.75 mSv (75 mrem) to the thyroid, and 0.25 mSv (25 mrem) to any other organ.

    Meeting the requirements of 10 CFR 20.1301(e) necessitates the consideration of all potential sources of external radiation and radioactivity, including liquid and gaseous effluents and external radiation exposures from buildings, storage tanks, radioactive waste, storage areas, and N-16 skyshine from BWR turbine buildings. The EPA standards apply to the entire site or facility, which may have either single or multiple units. SRP Sections 11.2 and 11.3 address sources of radioactivity and doses associated with liquid and gaseous effluents, respectively. In turn, SRP Section 11.5 addresses compliance with all sources of effluents. SRP Section 12.3-12.4 addresses sources of radiation and external radiation exposures from buildings housing the SWMS, radioactive waste storage areas, storage tanks, and other site buildings.

III. REVIEW PROCEDURES

The reviewer will select material from the procedures described below, as may be appropriate for a particular case.

These review procedures are based on the identified SRP acceptance criteria. For deviations from these acceptance criteria, the staff should review the applicant's evaluation of how the proposed alternatives provide an acceptable method of complying with the relevant NRC requirements identified in Subsection II.

In accordance with Regulatory Guide 1.70 or 1.206, the NRC staff will review for completeness the information describing the design features of the SWMS provided in the SAR, the DC application, update of the final SAR, or the COL application, to the extent not addressed in a referenced certified design, including referenced subsections of SRP Sections 11.1, 11.2, 11.3, 11.5, and 12.3-12.4.

1. The P&IDs and the process flow diagrams are reviewed to determine system design, methods of operation, and parameters used in the design (i.e., expected and design flow rates, concentrations of radioactive material, radionuclide distributions, and waste categories). The system design and design criteria, including mobile waste processing

systems, are compared with Regulatory Guide 1.143, BTP 11-3, and available data from operating plants of similar design, as they relate to wastes produced during normal operation and anticipated operational occurrences.

2. The methods to be used for stabilization and/or dewatering are compared with experience gained from previous licensing reviews and with available data from operating plants employing similar methods. The elements of the PCP are reviewed to assure that the proposed stabilization and/or dewatering method is capable of solidifying and/or dewatering the range of constituents expected to be present in wastes. The methods proposed to verify that all wet wastes can be adequately stabilized or dewatered are reviewed, and a determination is made as to their acceptability considering (a) the ability of the technique to detect free, mobile, or uncombined liquids (in the case of encapsulation or solidification) or excess free water (such as in the case of dewatering), (b) the procedures to be employed to solidify or dewater free liquids if detected, (c) the expected final waste form characteristics, and (d) the extent of reliance on mobile processing systems and waste processors. The PCP, including dewatering or stabilization (if performed), is reviewed on a plant-specific basis against the 10 CFR Part 61 requirements and guidance given in BTP 11-3 and Generic Letter Nos. 80-009, 81-038, and 81-039.

3. The description of procedures for the packaging and shipment of solid wastes to an approved offsite disposal facility or waste processor is reviewed, and the reviewer verifies that the applicant makes definite commitments to follow appropriate NRC and DOT regulations, as well as EPA and State regulations addressing the presence of other toxic and hazardous materials. The values given in the SAR for the volumes, radionuclide distributions and concentrations, and radioactive inventories of wastes to be shipped off site are compared with data from operating plants of similar design and information from previous license applications.

4. The solid waste system design capacity is compared with the design basis of expected waste volumes to determine whether the applicant has provided sufficient reserve capacity for greater-than-expected waste volumes, which may occur as a result of anticipated operational occurrences. The inplant storage capacity, for areas designed to accommodate approximately 6 months of waste generation, is compared to the guidelines of BTP 11-3. The comparison will be based on the design criteria as stated in the SAR, the availability of system components to handle surge flows, reliance on mobile processing systems, and whether the storage facilities will provide onsite storage duration periods sufficient to permit the decay of shorter lived radionuclides. For longer term onsite storage (e.g., several years, but within the operational life of the plant), the storage facility is compared to the guidelines of Appendix 11.4-A to this SRP section.

5. The equipment layout, design features, and mode of operation of the solid waste system, as permanently installed systems or in combination with mobile processing equipment, are compared to the guidelines of Regulatory Guide 1.143 and BTP 11-3, as they relate to wastes produced during normal operation and anticipated operational occurrences.

6. Review of the PCP and TS (i.e., administrative controls section proposed by the applicant for process and effluent control) is performed for input to the review of SRP Section 16.0 and this SRP section. The reviewer will determine that the content and scope of the programs identified in the administrative controls section of the TS prepared by the applicant are in agreement with requirements identified as a result of

the NRC staff's review. The review will include the evaluation or development of appropriate limiting conditions for operation or controls and their bases, consistent with the plant design. The programs identified in the administrative controls section of the TS are reviewed according to the requirements of 10 CFR 50.36a.

7. The classification and characterization of wastes are compared to the requirements of 10 CFR 61.55 and 10 CFR 61.56. The requirements address the classification and characteristics of wastes, and they define maximum radionuclide concentrations allowable for land disposal as Class A, B, and C wastes.

8. Meeting the requirements of 10 CFR 50.34a, as it relates to the SWMS, provides assurance that each nuclear power reactor will have necessary design features and equipment to control releases of radioactive liquid and gaseous effluents to the environment in accordance with the requirements of 10 CFR 20.1302 and 20.1301(e); Appendix I to 10 CFR Part 50; and Appendix A to 10 CFR Part 50, GDC 60 and GDC 61. These requirements may be evaluated using the following two approaches:

   A. As part of the review of this SRP section, including a verification of compliance with offsite dose requirements and liquid and gaseous effluent limits associated with the operation of the SWMS; or

   B. With the results of the review incorporated in the evaluation of SRP Sections 11.2 and 11.3, addressing compliance with offsite dose requirements, effluent concentrations limits, and all liquid and gaseous effluents from all sources, including those generated by the operation of the SWMS

9. The SWMS is reviewed to ensure that the design includes provisions to prevent and collect leakage resulting from overflows, leaks, and spillage associated with waste processing, storage, and movement of waste containers; operation of mobile processing equipment; and use of indoor or outdoor storage tanks (including temporary tanks) and is in conformance with 10 CFR 20.1406 requirements and guidelines of Regulatory Guide 1.143 for wastes produced during normal operation and anticipated operational occurrences.

   The review considers information describing design features that will minimize, to the extent practicable, contamination of the facility and environment; facilitate eventual decommissioning; and minimize, to the extent practicable, the generation of extraneous radioactive wastes associated with the operation of the SWMS as a result of operator error and processing equipment failures or malfunctions. In addition, the review may also consider the information contained in the DC application and updates in the SAR or the COL application to the extent not addressed in a referenced certified design. The NRC guidance includes the following:

   A. Memorandum from Larry W. Camper to David B. Matthews and Elmo E. Collins, dated October 10, 2006 (ADAMS Accession No. ML0619201830); and NUREG/CR-3587, as they relate to the design issues that need to be addressed to meet the requirements of 10 CFR 20.1406

   B. "Liquid Radioactive Release Lessons Learned Task Force, Final Report," Sections 2.0 and 3.2.2, September 1, 2006 (ADAMS Accession No. ML062650312)

C. Regulatory Guides 1.11 and 1.143 for wastes produced during normal operation and anticipated operational occurrences

D. SRP Section 9.2.4

E. Relevant NRC bulletins and circulars—for example, IE Bulletin Nos. 79-19 and 80-10; IE Circular Nos. 77-10, 77-14, 79-07, 79-09, 79-21, and 81-09; and IE Information Notice Nos. 84-72, 85-92, 87-07, and 90-31

F. Industry standards, e.g., ANSI/ANS-55.6-1993 (1999), and ANSI/ANS-40.37-1993 (200x updated draft)

10. The PCP and associated plant TS are reviewed to determine whether they identify all regulatory requirements, follow the NRC's guidance, and contain all appropriate operational elements. The regulatory requirements are associated with 10 CFR 61.55 and 10 CFR 61.56 for waste classification and characteristics; 10 CFR 20.2006 for the characterizations of waste in shipping manifests; 10 CFR 20.2007, as it relates to other applicable Federal, State, and local regulations governing the presence of any other toxic or hazardous materials; the NRC and DOT shipping regulations under 10 CFR Part 71 and 49 CFR Parts 171–180; and waste acceptance criteria of authorized disposal facilities or waste processors. The PCP should describe, given specific waste processing technologies and methods, a set of parameters used to process wastes. The PCP should identify surveillance requirements consistent with the plant's TS, administrative procedures, operational procedures, quality assurance and quality control program, radiological controls and monitoring, information to be contained in annual radiological effluent release reports, reporting requirements to the NRC, instructions on the use of the NRC's uniform radioactive shipping waste manifest, and the process for initiating and documenting changes to the PCP and its supporting procedures.

    Related guidance may be found in NUREG-1301 (PWRs) or NUREG-1302 (BWRs), NUREG-0133, NUREG/BR-0204, and Regulatory Guide 1.21. Specific guidance on waste form, characterization, and classification is listed in Inspection Procedure 84850; "Issuance of Final Branch Technical Position on Concentration Averaging and Encapsulation," dated January 17, 1995; "Final Waste Classification and Waste Form Technical Position Papers," dated May 11, 1983; "Revised Staff Technical Position on Waste Form (SP-91-13)," dated January 30, 1991; and IE Information Notice No. 86-20, dated March 28, 1986, on methodologies used to develop waste scaling factors. IE Bulletin No. 79-19 and IE Information Notice Nos. 84-72, 85-92, 87-07, and 90-31 present illustrative examples of issues associated with some operational aspects of the PCP.

11. In determining compliance with the EPA generally applicable environmental radiation standards of 40 CFR Part 190, as implemented under 10 CFR 20.1301(e), the review considers all sources of radiation and radioactivity as potential contributors to total doses to members of the public from the site, whether from single or multiple units. The review focuses on sources of radioactivity and external radiation exposures from waste processing buildings, waste storage buildings, waste storage tanks, and temporary waste storage or staging areas. The source terms and associated doses from liquid and gaseous effluents associated with the operation of the SWMS may be evaluated in this section of the SRP or integrated with the evaluation of SRP Sections 11.2 and 11.3.

In turn, SRP Section 11.5 addresses compliance with all sources of effluents. SRP Section 12.3-12.4 evaluates the doses associated with external radiation from buildings and contained sources of radioactivity.

12. Operational Programs. The reviewer verifies that the PCP aspect of the Process and Effluent Monitoring and Sampling Program is fully described and that implementation milestones have been identified. The reviewer verifies that the program and implementation milestones are included in FSAR Table 13.x.

    Implementation of this program will be inspected in accordance with NRC Inspection Manual Chapter IMC-2504, "Construction Inspection Program - Non-ITAAC Inspections."

    The applicant described the PCP aspect of the Process and Effluent Monitoring and Sampling Program and its implementation which is included in the license condition on operational programs and implementation.

13. For review of a DC application, the reviewer should follow the above procedures to verify that the design, including requirements and restrictions (e.g., interface requirements and site parameters), set forth in the final safety analysis report (FSAR) meets the acceptance criteria. DCs have referred to the FSAR as the design control document (DCD). The reviewer should also consider the appropriateness of identified COL action items. The reviewer may identify additional COL action items; however, to ensure these COL action items are addressed during a COL application, they should be added to the DC FSAR.

    For review of a COL application, the scope of the review is dependent on whether the COL applicant references a DC, an early site permit (ESP) or other NRC approvals (e.g., manufacturing license, site suitability report or topical report).

    For review of both DC and COL applications, SRP Section 14.3 should be followed for the review of ITAAC. The review of ITAAC cannot be completed until after the completion of this section.

IV. EVALUATION FINDINGS

The reviewer verifies that the applicant has provided sufficient information and that the review and calculations (if applicable) support conclusions of the following type to be included in the staff's safety evaluation report. The reviewer also states the bases for those conclusions.

The staff concludes that the design of the SWMS (either as a permanently installed system or in combination with mobile systems), which includes the equipment necessary to process liquid, wet, and dry solid wastes and to control releases of radioactive materials associated with the operation of the SWMS, is acceptable and meets the requirements of 10 CFR 20.1301 and 20.1302, 10 CFR 20.1301(e), 10 CFR 20.1406, 10 CFR 20.2006, 10 CFR 20.2007, and 10 CFR 20.2108; 10 CFR (50.34a) and Appendix I dose objectives; GDC 60, 61, and 63; 10 CFR Part 61, 10 CFR Part 71, and 49 CFR Parts 171–180 for the proper classification, characterization, packaging, shipment, and disposal of radioactive wastes; and applicable NRC BTPs and regulatory guides.

This conclusion is based on the following:

1. The applicant has demonstrated that the SWMS, either as a permanently installed system or in combination with mobile systems, includes the equipment and instrumentation used for the processing, packaging, and storage of radioactive wastes before shipment to an offsite licensed land disposal facility or waste processors. The scope of the review of the SWMS includes line or flow diagrams of the system, P&IDs, process and effluent radiation monitoring and control instrumentation, and descriptive information for the SWMS and for those auxiliary supporting systems that are essential to the operation of the SWMS. The staff has reviewed the applicant's proposed design criteria and design bases for the SWMS, as well as the applicant's analysis of those criteria and bases. The ability of the proposed system to process the types and volumes of wastes, including radionuclides and radioactivity levels, expected during normal operation and anticipated operational occurrences, are in accordance with GDC 60, 61, and 63; provisions for the handling of wastes under the requirements of 10 CFR Part 61 and 10 CFR 71; and applicable DOT regulations under 49 CFR Parts 171–180. The staff found the design features built into the SWMS to control effluent releases to unrestricted areas within the limits of 10 CFR Part 20, arising from system operations, to be acceptable.

   Based on the staff's review, the applicant's proposed PCP, operating procedures, and TS, as they relate to classifying, processing, and disposing of wastes, meet the requirements of 10 CFR Part 61 and 10 CFR 20.2006, 10 CFR 20.2007, and 10 CFR 20.2108. The applicant's proposed methods of assuring complete stabilization, encapsulation, and/or dewatering are acceptable, and the processing, design features, and waste storage also meet the requirements of BTP 11-3 and Appendix 11.4-A to this SRP section (as it relates to plants with temporary onsite storage facilities for low-level radioactive waste). The PCP describes, given the proposed waste processing technologies and methods, a set of parameters that are used to process wastes. The PCP identifies surveillance requirements consistent with the plant's TS, administrative procedures, operational procedures, quality assurance and quality control program, radiological controls and monitoring program, information to be contained in annual radiological effluent release reports, reporting requirements to the NRC, instructions on using the NRC's uniform radioactive shipping waste manifest, and the process for initiating and documenting changes to the PCP and its supporting procedures.

   The basis for acceptance in the staff's review is conformance of the applicant's design, design criteria, design bases, and proposed PCP and TS for the SWMS, including the associated use of mobile processing equipment, to the regulations and regulatory guidance, as referenced above, as well as to branch technical positions and industry standards.

2. The applicant has met the requirements of 10 CFR 20.1406 with respect to providing a description of how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment; facilitate eventual decommissioning; and minimize, to the extent practicable, the generation of radioactive waste.

3. The applicant has met the requirements of Appendix A to 10 CFR Part 50, GDC 60, 61, and 63, with respect to controlling releases of radioactive materials to the environment using available technology. The staff has considered the ability of the proposed SWMS and mobile processing equipment to meet the

demands of the plant resulting from anticipated operational occurrences and has concluded that the system capacity and design flexibility are adequate to meet the plant's anticipated needs.

The applicant has fulfilled the requirements of Section II.D of Appendix I to 10 CFR Part 50 with respect to meeting the ALARA criterion. The staff has considered the potential effectiveness of augmenting the proposed SWMS using items of reasonably demonstrated technology and has determined that further waste treatment will not effect reductions in cumulative population doses reasonably expected within an 80-kilometer (50-mile) radius of the reactor at a cost of less than $1000 per man-rem or man-thyroid-rem.

4. The staff has reviewed the applicant's quality assurance provisions for the SWMS, the quality group classifications used for system components, and the seismic design applied to structures housing these systems. The design of the systems and structures housing these systems meet the guidance of Regulatory Guide 1.143 for wastes produced during normal operation and anticipated operational occurrences.

5. The staff has reviewed the provisions incorporated in the applicant's design to control the release of radioactive materials in wastes resulting from spills, leaks, and inadvertent tank overflows; avoid the contamination of nonradioactive systems; prevent uncontrolled and unmonitored releases of radioactive materials to the environment; and avoid interconnections with potable and sanitary water systems. The staff concludes that the measures proposed by the applicant are consistent with the requirements of GDC 60 and 61 to 10 CFR Part 50, Appendix A, and 10 CFR 20.1406, and the guidance of Regulatory Guide 1.143 for wastes produced during normal operation and anticipated operational occurrences.

6. The applicant described the PCP aspect of the Process and Effluent Monitoring and Sampling Program and its implementation which is included in the license condition on operational programs and implementation.

7. For DC and COL reviews, the findings will also summarize the staff's evaluation of requirements and restrictions (e.g., interface requirements and site parameters) and COL action items relevant to this SRP section.

   In addition, to the extent that the review is not discussed in other SER sections, the findings will summarize the staff's evaluation of the ITAAC, including design acceptance criteria, as applicable.

V. IMPLEMENTATION

The staff will use this SRP section in performing safety evaluations of DC applications and license applications submitted by applicants pursuant to 10 CFR Part 50 or 10 CFR Part 52. Except when the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the staff will use the method described herein to evaluate conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications submitted six months or more after the date of issuance of this SRP section, unless superseded by a later revision.

VI. REFERENCES

1. 10 CFR Part 20, “Standards for Protection Against Radiation.”

2. 10 CFR 20.1201, “Occupational Dose Limits for Adults.”

3. 10 CFR 20.1202, “Compliance with Requirements for Summation of External and Internal Doses.”

4. 10 CFR 20.1301, “Dose Limits for Individual Members of the Public.”

5. 10 CFR 20.1302, “Compliance with Dose Limits for Individual Members of the Public.”

6. 10 CFR 20.1406, “Minimization of Contamination.”

7. 10 CFR 20.2006, “Transfer for Disposal and Manifests.”

8. 10 CFR 20.2007, “Compliance with Environmental and Health Protection Regulations.”

9. 10 CFR 20.2108, “Records of Waste Disposal.”

10. 10 CFR Part 20, Appendix B, “Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage.”

11. 10 CFR 50.34a, “Design Objectives for Equipment to Control Releases of Radioactive Material in Effluents—Nuclear Power Reactors.”

12. 10 CFR Part 50, Appendix I, “Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion ‘As Low As Is Reasonably Achievable’ for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents.”

13. 10 CFR 50.36a, “Technical Specifications on Effluents from Nuclear Power Reactors.”

14. 10 CFR Part 50, Appendix A, General Design Criterion 60, “Control of Releases of Radioactive Materials to the Environment.”

15. 10 CFR Part 50, Appendix A, General Design Criterion 61, “Fuel Storage and Handling and Radioactivity Control.”

16. 10 CFR Part 50, Appendix A, General Design Criterion 63, “Monitoring Fuel and Waste Storage.”

17. 10 CFR Part 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

18. 10 CFR Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste.”

19. 10 CFR Part 71, “Packaging and Transportation of Radioactive Material.”

20. 10 CFR Part 100, “Reactor Site Criteria.”

21. 49 CFR Parts 171–180, “Subpart C—Hazardous Materials Regulations.”

22. Regulatory Guide 1.11, “Instrument Lines Penetrating Primary Reactor Containment.”

23. Regulatory Guide 1.21, “Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants.”

24. Regulatory Guide 1.33, “Quality Assurance Program Requirements (Operation).”

25. Regulatory Guide 1.70, “Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants.”

26. Regulatory Guide 1.110, “Cost Benefit Analysis for Radwaste Systems for Light-Water-Cooled Nuclear Power Reactors.”

27. Regulatory Guide 1.112, “Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Light-Water-Cooled Power Reactors.”

28. Regulatory Guide 1.143, “Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants.”

29. Regulatory Guide 1.206, “Combined License Applications for Nuclear Power Plants (LWR Edition).”

30. Regulatory Guide 8.8, “Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable.”

31. Regulatory Guide 8.10, “Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable.”

32. Branch Technical Position (BTP 11-3), “Design Guidance for Solid Radioactive Waste Management Systems Installed in Light-Water-Cooled Nuclear Power Reactor Plants.”

33. Standard Review Plan, Section 11.4, Appendix 11.4-A, “Design Guidance for Temporary Storage of Low-Level Radioactive Waste.”

34. NRC Generic Letter 80-009, “Low Level Radioactive Waste Disposal.”

35. NRC Generic Letter 81-038, “Storage of Low Level Radioactive Wastes at Power Reactor Sites.”

36. NRC Generic Letter 81-039, “NRC Volume Reduction Policy.”

37. NRC Inspection Procedure 84850, “Radioactive Waste Management—Inspection of Waste Generator Requirements of 10 CFR Part 20 and 10 CFR Part 61,” June 6, 2002.

38. NRC, “Issuance of Final Branch Technical Position on Concentration Averaging and Encapsulation,” January 17, 1995.

39. NRC, “Final Waste Classification and Waste Form Technical Position Papers,” May 11, 1983.

40. NRC Inspection Manual Chapter IMC-2504, “Construction Inspection Program - Non-ITAAC Inspections,” issued April 25, 2006.

41. NRC, “Revised Staff Technical Position on Waste Form (SP-91-13),” January 30, 1991.

42. NUREG-0016, “Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Boiling Water Reactors (BWRs) (BWR-GALE Code).”

43. NUREG-0017, “Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Pressurized Water Reactors (PWRs) (PWR-GALE Code).”

44. NUREG-0133, “Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants.”

45. NUREG-1301, “Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors.”

46. NUREG-1302, “Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors.”

47. NUREG/BR-0204, “Instructions for Completing NRC’s Uniform Low-Level Radioactive Waste Manifest.”

48. IE Circular No. 77-10, “Vacuum Conditions Resulting in Damage to Liquid Process Tanks,” July 15, 1977.

49. IE Circular No. 77-14, “Separation of Contaminated Water Systems from Noncontaminated Plant Systems,” November 22, 1977.

50. IE Circular No. 79-21, “Prevention of Unplanned Releases of Radioactivity,” October 19, 1979.

51. IE Circular No. 81-09, “Containment Effluent Water That Bypasses Radioactivity Monitor,” July 10, 1981.

52. IE Information Notice No. 79-07, “Rupture of Radwaste Tanks,” March 23, 1979.

53. IE Information Notice No. 79-09, “Spill of Radioactively Contaminated Resin,” March 30, 1979.

54. IE Bulletin No. 79-19, “Packaging of Low-Level Radioactive Waste for Transportation and Burial,” August 10, 1979.

55. IE Bulletin No. 80-10, “Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment,” May 6, 1980.

56. IE Information Notice No. 90-31, “Update on Waste Form and High Integrity Container Topical Report Review Status, Identification of Problems with Cement Solidification and Reporting of Waste Mishaps,” May 4, 1990.

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58. IE Information Notice No. 87-07, “Quality Control of Onsite Dewatering/Solidification Operations by Outside Contractors,” February 3, 1987.

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60. IE Information Notice No. 86-20, “Low-Level Radioactive Waste Scaling Factors, 10 CFR Part 61,” March 28, 1986.

61. Memorandum from Larry W. Camper to David B. Matthews and Elmo E. Collins, dated October 10, 2006, “List of Decommissioning Lessons Learned in Support of the Development of a Standard Review Plan for New Reactor Licensing” (ADAMS Accession No. ML0619201830).

62. NUREG/CR-3587, “Identification and Evaluation of Facility Techniques for Decommissioning of Light Water Reactors.”

63. Office of Nuclear Reactor Regulation, “Liquid Radioactive Release Lessons Learned Task Force, Final Report,” Sections 2.0 and 3.2.2, September 1, 2006 (ADAMS Accession No. ML062650312).

64. ANSI/ANS-55.6-1993 (1999), "Liquid Radioactive Waste Processing System for Light Water Reactor Plants." Reaffirmed in 1999.

65. ANSI/ANS-40.37-1993 (200x updated draft), "American National Standard For Mobile Low-Level Radioactive Waste Processing Systems." Proposed 2007 draft for public comments.

66. SECY 93-323, “Withdrawal of Proposed Rulemaking to Establish Procedures and Criteria for On-Site Storage of low-Level Radioactive Waste After January 1, 1996,” Nov. 29, 1993. Issued under SRM dated Feb. 1, 1994.

67. NRC Inspection Manual Chapter IMC-2504, “Construction Inspection Program - Non-ITAAC Inspections,” issued April 25, 2006.

PAPERWORK REDUCTION ACT STATEMENT

The information collections contained in the Standard Review Plan are covered by the requirements of 10 CFR Part 50 and 10 CFR Part 52, and were approved by the Office of Management and Budget, approval number 3150-0011 and 3150-0151.

PUBLIC PROTECTION NOTIFICATION

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APPENDIX 11.4-A
DESIGN GUIDANCE FOR TEMPORARY STORAGE OF LOW-LEVEL RADIOACTIVE WASTE

I. INTRODUCTION

The objective of this technical position is to provide guidance to licensees considering additional onsite low-level radioactive waste storage capabilities. While it may be prudent and/or necessary to establish additional onsite storage capability, waste should not be placed in contingency storage if it can be disposed at a licensed disposal site. Shipping waste at the earliest practicable time minimizes the need for eventual waste reprocessing caused by potential changes in a disposal facility's requirements, reduces occupational and nonoccupational exposures and potential accident consequences, and, in the event of burial ground closure, maximizes the amount of storage space available for use.

The duration of the intended storage, the type and form of waste, and the amount of radioactive material present will dictate the safeguards and the level of complexity required to assure public health and safety and minimal risk to operating personnel. The longer the intended storage period, the greater the degree of controls that will be required for radiation protection and accident prevention. The duration of the onsite storage safety hazard is predicated on the type of waste being stored, the amount of radionuclides present, and how readily the radionuclides might be transported into the environment. In general, it is preferable to store radioactive material in solid form. Under some circumstances, however, temporary storage in a liquid form may be desirable or required. The specific design and operation of any storage facility will be significantly influenced by the various waste forms; consequently, this document addresses wet waste, stabilized wet waste, and dry low-level radioactive waste.

II. GENERAL INFORMATION

Before implementing any additional onsite storage capacity, licensees should conduct substantial safety review and environmental assessments to assure adequate public health and safety protections and minimal environmental impact. The acceptance criteria and performance objectives of any proposed storage facility or area will need to meet minimal requirements in design, operations, safety considerations, policy considerations, and compliance with other applicable Federal, State, and local regulations governing any other toxic or hazardous properties of radioactive wastes (such as mixed wastes characterized by the presence of hazardous chemicals and radioactive materials). For purposes of this technical position, the major emphasis will be on safety considerations in the storing, handling, and eventual disposition of the radioactive waste. Design and operational acceptability will be based on minimal requirements, which are defined in existing SRPs, regulatory guides, and industry standards for proper management of radioactive waste. Considerations for waste minimization and volume reduction will also need to be part of an overall site waste management plan and the chosen onsite storage alternative. Licensees and applicants should implement additional waste management considerations for ALARA, decontamination, and decommissioning of the temporary storage facility, including disposal, as early as possible, because future requirements for waste forms may make stored wastes unacceptable for final disposition.

Facility design and operation should assure that radiological consequences of design basis events (e.g., fire, tornado, seismic occurrence, and flood) do not exceed a small fraction (10 percent) of 10 CFR Part 100 dose limits (i.e., no more than a few sieverts whole body dose). The added storage capacity should typically consider the anticipated low-level waste volumes generated over the operational life of the plant. Licensees should determine the

design storage capacity (volume and radioactive material inventories) from historical and projected waste generation rates for all units, considering both volume minimization/reduction programs and the need for surge capacity due to operations which may generate unusually large amounts of waste. Further guidance is provided in Generic Letter No. 80-09, 81-38, and 81-39, and in SECY 94-198 and SECY 93-323. It should be noted that under SECY 94-198 and SECY 93-323, the provision requiring a Part 30 license for the storage of waste beyond 5 years has been eliminated. However, the balance of the technical information presented in Generic Letter No. 81-38 on the storage of low-level waste remains applicable for the purpose of this guidance.

In considering expanded storage capacity, licensees should consider the design and construction of additional volume reduction facilities (e.g., trash compactors, shredders, incinerators, etc.), as necessary, and then process wastes that may have been stored during their construction. Regional State low-level waste compacts and unaffiliated States may establish new or additional low-level waste disposal sites in the future under 10 CFR Part 61 or equivalent State regulations.

III. GENERALLY APPLICABLE GUIDANCE

1. The quantity of radioactive material allowed and the shielding configurations will be dictated by the dose rate criteria for both the site boundary and unrestricted areas or site. The 40 CFR Part 190 limits will restrict the annual dose from direct radiation and effluent releases from all sources of uranium fuel cycle, and 10 CFR 20.1302 limits the exposure rates in unrestricted areas. Offsite doses from onsite storage must be sufficiently low to account for other uranium fuel cycle sources (e.g., an additional dose of less than or equal to 0.01 mSv (1 mrem) per year is not likely to cause the 40 CFR Part 190 limits, as implemented under 10 CFR 20.1301(e) to be exceeded. Onsite dose limits associated with temporary storage will be controlled per 10 CFR Part 20, including the ALARA principle of 10 CFR 20.1101.

2. Compatibility of the container materials with the waste forms and with environmental conditions external to the containers is necessary to prevent significant container corrosion. Container selection should be based on data that demonstrate minimal corrosion from the anticipated internal and external environment for a period well in excess of the planned storage duration. Container integrity after the period of storage should be sufficient to allow handling during transportation and disposal without container breach.

   Gas generation from organic materials in waste containers can also lead to container breach and potentially flammable/explosive conditions. To minimize the number of potential problems, licensees should evaluate the waste form gas generation rates from radiolysis, biodegradation, or chemical reaction with respect to container breach and the creation of flammable or explosive conditions. Unless storage containers are equipped with special vent designs that allow depressurization and do not permit the migration of radioactive materials, resins highly loaded with radioactive material, such as BWR reactor water cleanup system resins, should not be stored for longer than approximately 1 year.

   Licensees should implement a program providing for at least periodic (quarterly) visual inspections of container integrity (e.g., swelling, corrosion products, leaks, or breach). Inspections can be accomplished by the use of television monitors; by walkthroughs if storage facility layout, shielding, and container storage array permit; or by selecting

waste containers that are representative of the types of waste and containers stored in the facility and placing them in a location specifically designed for inspection purposes. All inspection procedures developed should minimize occupational exposure. The use of high-integrity containers (300-year lifetime design) would permit an inspection program of reduced scope.

3. If possible, the preferred location of the additional storage facility is inside the plant's protected area. If adequate space in the protected area is not available, the licensee should place the storage facility on the plant site and establish both a physical security program (fence, locked and alarmed gates and doors, and periodic patrols) and a restricted area for radiation protection purposes. The facility should not be in a location that requires transportation of the waste over public roads unless no other feasible alternatives exist. Licensees must conduct any transportation over public roads in accordance with the NRC and DOT regulations (10 CFR Part 71 and 49 CFR Parts 171–180).

4. Licensees should implement operational safety features to prevent the accidental dropping of containers from cranes and forklifts or the puncturing of containers from forklifts during the movement and transportation of radioactive waste containers. Personnel should receive training in the proper operation of such equipment and instruction on the use of methods to securely hold containers on such equipment (e.g., tie-downs, gates, cages).

5. The facility should include design features, in accordance with 10 CFR 20.1406, that would minimize, to the extent practicable, contamination of the waste facility and environment; facilitate eventual decommissioning; and minimize, to the extent practicable, the generation of extraneous radioactive waste. This requirement applies to storage facilities used to process and store liquid, wet, dry solid, and stabilized wastes.

6. For low-level dry waste and stabilized waste storage, the following criteria apply:

   A. Licensees shall monitor potential release pathways of all radionuclides present in the stabilized waste form as described in Appendix A to 10 CFR Part 50. Surveillance programs shall incorporate adequate methods for detecting failure of container integrity and measuring releases to the environment. For outside storage, licensees shall conduct periodic direct radiation and surface contamination monitoring to ensure that levels are below limits specified in 10 CFR 20.1301 and 10 CFR 20.1302, 10 CFR Part 71, and Subpart I (Class 7) of 49 CFR Part 173. All containers should be decontaminated to these or lower levels before storage.

   B. Licensees should incorporate provisions for collecting liquid drainage, including provisions for sampling all collected liquids. Routing of the collected liquids should be to radwaste systems if contamination is detected or to normal discharge pathways if the water ingress is from external sources and remains uncontaminated by plant-generated radioactivity.

   C. Waste stored in outside areas should be held securely by installed holddown systems. The holddown system should secure all containers during severe environmental conditions, up to and including the design-basis event for the waste storage facility.

D. Licensees should assure container integrity against corrosion from the external environment, including external weather protection where necessary and practical. Storage containers should be raised off storage pads where water accumulation can be expected to cause external corrosion and possible degradation of container integrity.

E. Licensees should establish total radioactive material inventory limits (in becquerels and curies), based on the design of the storage area, dose limits for members of the public, and safety features or measures being provided (e.g., radiation monitoring).

F. Licensees should maintain inventory records by waste types, waste contents, radionuclides and radioactive material, dates of storage, shipment, and other relevant data.

G. The facility design should incorporate provisions for a ventilation exhaust system (for storage areas) and an airborne radioactivity monitoring system (building exhaust vents) where there is a potential for airborne radioactivity to be generated or to accumulate.

IV. WET RADIOACTIVE WASTE STORAGE

1. Wet radioactive waste is defined as any liquid, liquid/solid slurry, or process concentrate. For storage considerations, wet waste is further defined as any waste that contains free liquid in amounts exceeding the requirements for burial as established by the burial ground licensing authority.

2. The design of the facility's supporting structure and tanks should prevent uncontrolled and unmonitored releases of radioactive materials resulting from spillage or accident conditions.

3. The following design objectives and criteria apply to wet radioactive waste storage facilities:

   A. Structures that house liquid radwaste storage tanks should be designed to seismic criteria as defined in SRP Section 11.2 and Regulatory Guide 1.143 for wastes produced during normal operation and anticipated operational occurrences. Foundations and walls shall also be designed and fabricated to contain the liquid inventory that might be released during a container/tank failure.

   B. All tanks or containers should be designed to withstand the corrosive nature of the wet waste being stored. The design shall also consider the duration of storage under which the corrosive conditions exist.

   C. All storage structures should have curbs or elevated thresholds with floor drains and sumps to safely collect wet waste in the event of the failure of all tanks or containers. There should be provisions to remove spilled wet waste to the radwaste treatment systems.

   D. All tanks and containers shall have provisions to monitor liquid levels and to sound an alarm in the event of potential overflow conditions.

E. All potential release pathways of radionuclides (e.g., evolved gases, breach of container) shall be controlled, if feasible, and monitored in accordance with Appendix A to 10 CFR Part 50, GDC 60 and 64. Surveillance programs should incorporate adequate methods for monitoring breach of container integrity or accidental releases.

F. All temporarily stored wet waste will require additional reprocessing before shipment off site; therefore, provisions should be made to integrate the required treatment with the waste processing and stabilization systems. The interface and associated systems should be designed and tested in accordance with the codes and standards described in SRP Section 11.2 and Regulatory Guide 1.143 for wastes produced during normal operation and anticipated operational occurrences.

G. The facility design should include provisions for a ventilation exhaust system (for storage areas) and an airborne radioactivity monitoring system (building exhaust vents) where there is a potential for airborne radioactivity to be generated or to accumulate.

V. STABILIZED RADIOACTIVE WASTE STORAGE

1. Stabilized radwaste for storage purposes is defined as waste that meets stabilized waste criteria for licensed facilities. For purposes of this document, resins or filter sludge dewatered to the above criteria are defined under this waste classification/criteria.

2. Any storage plans should address container protection and any reprocessing requirements for eventual shipment and burial.

3. Casks, tanks, and liners containing stabilized radioactive waste should be designed with good engineering judgment to preclude or reduce the probability of uncontrolled releases of radioactive materials during handling, transportation, or storage. Licensees must evaluate the accident mitigation and control procedures and their ability to protect the facility from design basis events (e.g., fire, flooding, tornadoes) unless otherwise justified.

4. The following design objectives and criteria are applicable to stabilized waste storage containers and facilities:

A. All stabilized radwaste should be located in restricted areas where effective material control and accountability can be maintained. While structures are not required to meet seismic criteria, licensees should employ good engineering judgment to ensure that radioactive materials are contained safely, such as by the use of curbs and drains to contain spills of dewatered resins or sludge.

B. If liquids exist in a corrosive form, licensees should implement proven measures to protect the container (i.e., special liners or coatings) and/or neutralize the excess liquids. If deemed appropriate and necessary, highly noncorrosive materials (e.g., stainless steel) should be used. Potential corrosion between the solid waste forms and the container should also be considered. In the case of dewatered resins, highly corrosive acids and bases can be generated, which will significantly reduce the longevity of the container. The PCP should implement

steps to assure the above does not occur; provisions should be made to govern container material selection and precoating to ensure that container breach does not occur during temporary storage periods.

C. There should be provisions for additional reprocessing or repackaging in the event of container failure and/or as required by DOT regulations and license disposal facility criteria for final transportation and disposal. Licensees should develop contamination isolation and decontamination capabilities. When significant handling and personnel exposure can be anticipated, licensees should incorporate ALARA methodology in accordance with Regulatory Guides 8.8 and 8.10.

D. Licensees should develop and implement procedures for early detection, prevention, and mitigation of accidents (e.g., fires). Storage areas and facility designs should incorporate good engineering features and capabilities for handling accidents and provide safeguard systems, such as fire detectors and suppression systems (e.g., smoke detectors and sprinklers). If water sprinkler systems are used, floors should be sloped to drain into local floor sumps or curbed to prevent water runoff to uncontrolled areas. Licensees should establish personnel training and administrative procedures to ensure both control of radioactive materials and minimum personnel exposures. Fire suppression devices may not be necessary if combustible materials in the area are minimal.

E. The facility design should incorporate provisions for a ventilation exhaust system (for storage areas) and an airborne radioactivity monitoring system (building exhaust vents) where there is a potential for airborne radioactivity to be generated or to accumulate.

VI. LOW-LEVEL DRY WASTE STORAGE

1. Low-level dry waste is classified as contaminated material (e.g., paper, trash, plastics, glass, metals scraps, air filters, and spent charcoal media) that contains radioactive materials dispersed randomly in relatively small concentrations throughout large volumes of inert material and contains no free water. Generally, this consists of dry materials, such as rags, clothing, paper, and small equipment (i.e., tools and instruments), that cannot be easily decontaminated.

2. Licensees should implement controls to segregate and minimize the generation of low-level dry waste to lessen the impact on waste storage. Licensees should consider the integration of volume reduction hardware to minimize the need for additional waste storage facilities.

3. The following design objectives and criteria are applicable for low-level dry waste storage containers and facilities:

   A. All dry or compacted radwaste should be located in restricted areas where effective material control and accountability can be maintained. While structures are not required to meet seismic criteria, licensees should use good engineering judgment to ensure the radioactive material is contained safely.

B. The waste container design should ensure radioactive material containment during normal and abnormal occurrences. The waste container materials should not support combustion. The packaged material should not cause fires through spontaneous chemical reactions, retained heat, or the like.

C. Containers should generally comply with the criteria of 10 CFR Part 71 and 49 CFR Parts 171–180 to minimize the need for repackaging for shipment.

D. Increased container handling and personnel exposure can be anticipated; consequently, licensees should incorporate all ALARA methodology in accordance with Regulatory Guides 8.8 and 8.10.

E. Facility design should provide for a ventilation exhaust system (for storage areas) and an airborne radioactivity monitoring system (building exhaust vents) where there is a potential for airborne radioactivity to be generated or to accumulate.

VII. REFERENCES

1. 10 CFR Part 20, “Standards for Protection Against Radiation.”

2. 10 CFR 20.1301, “Dose Limits for Individual Members of the Public.”

3. 10 CFR 20.1302, “Compliance with Dose Limits for Individual Members of the Public.”

4. 10 CFR 20.1406, “Minimization of Contamination.”

5. 10 CFR Part 30, “Rules of General Applicability to Domestic Licensing of Byproduct Material.”

6. 10 CFR Part 50, Appendix A, General Design Criterion 60, “Control of Releases of Radioactive Materials to the Environment.”

7. 10 CFR Part 50, Appendix A, General Design Criterion 64, “Monitoring Radioactivity Releases.”

8. 10 CFR Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste.”

9. 10 CFR Part 71, “Packaging and Transportation of Radioactive Material.”

10. 10 CFR Part 100, “Reactor Site Criteria.”

11. 49 CFR Parts 171–180, “Subpart C—Hazardous Materials Regulations.”

12. Regulatory Guide 1.143, “Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants.”

13. Regulatory Guide 8.8, “Information Relevant to Ensuring That Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable.”

14. Regulatory Guide 8.10, “Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable.”

15. Generic Letter 80-009, “Low Level Radioactive Waste Disposal.”

16. Generic Letter 81-038, “Storage of Low Level Radioactive Wastes at Power Reactor Sites.”

17. Generic Letter 81-039, “NRC Volume Reduction Policy.”

18. SECY 93-323, “Withdrawal of Proposed Rulemaking to Establish Procedures and Criteria for On-Site Storage of low-Level Radioactive Waste After January 1, 1996,” Nov. 29, 1993. Issued under SRM dated Feb. 1, 1994.

19. SECY 94-198, “Review of Existing Guidance Concerning the Extended Storage of Low-Level Radioactive Waste, Aug. 1, 1994.”