U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REGULATORY RESEARCH

August 2000
Division 1
Draft DG-1100

DRAFT REGULATORY GUIDE

Contact: H. Graves (301)415-5880

DRAFT REGULATORY GUIDE DG-1100

(Proposed Revision 2 to Regulatory Guide 1.143)

DESIGN GUIDANCE FOR RADIOACTIVE WASTE MANAGEMENT SYSTEMS, STRUCTURES, AND COMPONENTS INSTALLED IN LIGHT-WATER-COOLED NUCLEAR POWER PLANTS

A. INTRODUCTION

This regulatory guide is being revised to provide guidance to licensees and applicants on methods acceptable to the staff for complying with the NRC's regulations in the design, construction, installation, and testing of radioactive waste management facilities, and the structures, systems, and components in light-water-reactor nuclear power plants.

In 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," § 50.34, "Contents of Applications; Technical Information," requires that each application for a construction permit include a preliminary safety analysis report. Part of the information required is related to quality assurance and the preliminary design of the facility, including, among other things, the principal design criteria for the facility. Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50 establishes overall quality assurance requirements for structures, systems, and components important to safety. Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 establishes minimum requirements for the principal design criteria for light-water-cooled nuclear power plants.

Criterion 1, "Quality Standards and Records," of Appendix A requires that structures, systems, and components important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance to safety of the safety function to be performed and that a quality assurance program be established and implemented in order to provide adequate assurance that these structures, systems, and components will satisfactorily perform their safety function.

Criterion 2, "Design Bases for Protection Against Natural Phenomena," of Appendix A requires, among other things, that structures, systems, and components important to safety be designed to

This regulatory guide is being issued in draft form to involve the public in the early stages of the development of a regulatory position in this area. It has not received complete staff review and does not represent an official NRC staff position.

Public comments are being solicited on the draft guide (including any implementation schedule) and its associated regulatory analysis or value/impact statement. Comments should be accompanied by appropriate supporting data. Written comments may be submitted to the Rules and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Comments may be submitted electronically or downloaded through the NRC's interactive web site at <WWW.NRC.GOV> through Rulemaking. Copies of comments received may be examined at the NRC Public Document Room, 2120 L Street NW., Washington, DC. Comments will be most helpful if received by November 20, 2000.

Requests for single copies of draft or active regulatory guides (which may be reproduced) or for placement on an automatic distribution list for single copies of future draft guides in specific divisions should be made in writing to the U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Reproduction and Distribution Services Section, or by fax to (301)415-2289; or by email to DISTRIBUTION@NRC.GOV. Electronic copies of this draft guide, Accession Number ML003740970, are available in NRC's Public Electronic Reading Room, which may be accessed through the NRC's web site, <www.nrc.gov>.

withstand the effects of natural phenomena such as earthquakes, extreme winds, tornados, or flooding without loss of capability to perform their safety functions. The design bases for these structures, systems, and components are to reflect the importance of the safety functions to be performed. Appendix S,"Earthquake Engineering Criteria for Nuclear Power Plants," of 10 CFR Part 50 states general design requirements for the implementation of General Design Criterion 2. Criterion 60, "Control of Releases of Radioactive Materials to the Environment," of Appendix A requires that the nuclear power unit design include suitable means to control the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid waste produced during normal reactor operation, including anticipated operational and external man-induced and design basis accident occurrences.

This regulatory guide is being revised to provide design guidance acceptable to the NRC staff on natural phenomena hazards, internal and external man-induced hazards, and quality group classification and quality assurance provisions for radioactive waste management systems, structures, and components.[1] Further, it describes provisions for mitigating design basis accidents, controlling releases of liquids containing radioactive materials, e.g., spills or tank overflows, from all plant systems outside reactor containment.

Licensees and applicants may propose means other than those specified by the provisions of the Regulatory Position of this for meeting applicable regulations. No new requirements are being imposed by this draft regulatory guide. Implementation of this guidance by licensees will be on a strictly voluntary basis.

Regulatory guides are issued to describe to the public methods acceptable to the NRC staff for implementing specific parts of the NRC's regulations, to explain techniques used by the staff in evaluating specific problems or postulated accidents, and to provide guidance to applicants. Regulatory guides are not substitutes for regulations, and compliance with regulatory guides is not required. Regulatory guides are issued in draft form for public comment to involve the public in developing Regulatory Positions. Draft regulatory guides have not received complete staff review; they therefore do not represent official NRC staff positions.

The information collections contained in this draft regulatory guide are covered by the requirements in 10 CFR Part 50, which were approved by the Office Management and Budget, approval number 3150-0011. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

B. DISCUSSION

One aspect of nuclear power plant operation is the control and management of liquid, gaseous, and solid radioactive waste[2] (radwaste) generated as a byproduct of nuclear power.

---

[1] Adams et al, "Re-evaluation of Regulatory Guidance Provided in Regulatory Guides 1.142 and 1.142," NUREG/CR-5733, August 1999. Copies are available at current rates from the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20402-9328 (telephone (202)512-1800); or from the National Technical Information Service by writing NTIS at 5285 Port Royal Road, Springfield, VA 22161; (telephone (703)487-4650; <http://www.ntis.gov/ordernow>. Copies are available for inspection or copying for a fee from the NRC Public Document Room at 2120 L Street NW., Washington, DC; the PDR's mailing address is Mail Stop LL-6, Washington, DC 20555; telephone (202)634-3273 or (800)397-4209; fax (202)634-3343; email is PDR@NRC.GOV.T.M.

[9] Radioactive waste, as used in this guide, means those liquids, gases or solids containing radioactive materials that by design or operating practice will be processed prior to final disposition.

The purpose of this guide is to provide information and criteria that will provide reasonable assurance that components and structures used in the radioactive waste management and steam generator blowdown systems are designed, constructed, installed, and tested on a level commensurate with the need to protect the health and safety of the public and plant operating personnel. It sets forth minimum staff recommendations and is not intended to prohibit the implementation of more rigorous design considerations, codes, standards, or quality assurance measures.

ANSI/ANS Standards 55.1-1992, "Solid Radioactive Waste Processing System for Light Water Cooled Reactor Plants,"[3] 55.4-1993, "Gaseous Radioactive Waste Processing Systems for Light Water Plants,"[3] and 55.6-1993, "Liquid Radioactive Waste Processing Systems for Light Water Reactor Plants,"[3] have been reviewed for applicability to this guide. These ANSI/ANS Standards provide a wider range of guidance than that provided in Section 11.0 of NUREG-0800, "USNRC Standard Review Plan."[4] As appropriate, guidance from the ANSI/ANS Standards has been incorporated by reference.

For the purposes of this guide, the radwaste systems are considered to begin at the interface valves in each line from other systems provided for collecting wastes that may contain radioactive materials and to include related instrumentation and control systems. The radwaste system terminates at the point of controlled discharged to the environment, at the point of recycle to the primary or secondary water system storage tanks, or at the point of storage of packaged solid wastes prior to shipment offsite to a licensed burial ground.

The steam generator blowdown system begins at, but does not include, the outermost containment isolation valve on the blowdown line. It terminates at the point of controlled discharge to the environment, at that point of interface with other liquid systems, or at the point of recycle back to the secondary system. For design purposes, portions of radwaste systems that interface with other systems are considered to be in the system with more rigorous requirements.

Except as noted, this guide does not apply to the reactor water cleanup system, the condensate cleanup system, the chemical and volume control system, the reactor coolant and auxilliary building equipment drain tanks, the sumps and floor drains provided for collecting liquid wastes, the boron recovery system, equipment used to prepare solid waste solidification agents, the building ventilation systems (heating, ventilating, and air conditioning), instrumentation and sampling systems beyond the first root valve, or the chemical fume hood exhaust systems. In addition, this guide does not apply to the main condenser circulating or component cooling water systems, or the spent fuel handing and storage systems, or the fuel pool water cleanup system.

The design and construction of radioactive waste management and steam generator blowdown systems should provide assurance that radiation exposures to operating personnel and to the general public are as low as is reasonably achievable. One aspect of this consideration is ensuring that these systems are designed to quality standards that enhance system reliability, operability, and availability. In developing this design guidance, the NRC staff has considered designs and concepts submitted in license applications and resulting

[9]Copies may be obtained from the American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Illinois 60525.

[9]Copies of sections of NUREG 0800 are available by email to DISTRIBUTION@NRC.GOV or by fax to (301)415-2289.

operating system histories. It has also been guided by industry practices and the cost of design features, taking into account the potential impact on the health and safety of operating personnel and the general public.

C. REGULATORY POSITION

1. SYSTEMS HANDLING RADIOACTIVE MATERIALS IN LIQUIDS

1.1 Liquid Radwaste Treatment System

The liquid radwaste treatment system, including the steam generator blowdown system, downstream of the outer most containment isolation valve should meet the following criteria:

1.1.1 The structures, systems, and components (SSCs) of the liquid radwaste treatment system should be designed and tested to requirements set forth in the codes and standards listed in Table 1, supplemented by Regulatory Positions 1.1.2 and 1.1.3 of this guide.

1.1.2 Materials for pressure-retaining components, excluding HVAC duct and fire protection piping, should conform to the requirements of the specifications for materials listed in Section II of the ASME Boiler and Pressure Vessel Code,[5] except that malleable, wrought, or cast iron materials and plastic pipe should not be used. Materials should be compatible with the chemical, physical, and radioactive environment of specific applications during normal conditions and anticipated operational occurrences. Manufacturers' material certificates of compliance with material specifications such as those contained in the codes referenced in Table 1 may be provided in lieu of certified material test reports.

1.1.3 Foundations and walls of structures that house the liquid radwaste system should be designed to the natural phenomena and internal and external man-induced hazards criteria described in Regulatory Position 6 of this guide to a height sufficient to contain the maximum liquid inventory expected to be in the building.

1.2 SSCs Outside Containment that Contain Radioactive Liquids

All SSCs located outside of the reactor containment and containing radioactive materials in liquid form should be classified as described in Regulatory Position 5 and designed to the criteria put forth in Regulatory Position 6. In addition, any such component should be designed to prevent uncontrolled releases of radioactive materials caused by spillage in buildings or from outdoor components. The following design features should be included for such components and should meet the criteria contained in Sections 5.2, 5.3, and 5.4 of ANSI/ANS 55.1-1191.

1.2.1 All tanks inside and outside the plant, including the condensate storage tanks, should have provisions to monitor liquid levels. Designated high-liquid-level conditions should actuate alarms both locally and in the control room.

---

[9] Copies may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017.

1.2.2 All radwaste tanks, overflows, drains, and sample lines should be routed to the liquid radwaste treatment system.[6]

1.2.3 Indoor radwaste tanks should have curbs or elevated thresholds with floor drains routed to the liquid radwaste treatment system.[6]

1.2.4 The design should include provisions to prevent leakage from entering unmonitored and nonradioactive systems and ductwork in the area.

1.2.5 Outdoor tanks should have a dike or retention pond capable of preventing runoff in the event of a tank overflow and should have provisions for sampling collected liquids and routing them to the liquid radwaste treatment system.

2. GASEOUS RADWASTE SYSTEMS

The gaseous radwaste treatment system[7] should meet the following criteria:

2.1 The SSCs of the gaseous radwaste treatment system should be designed and tested to requirements set forth in the codes and standards listed in Table 1 supplemented by Regulatory Positions 2.2 and 2.3 of this guide.

2.2 Materials for pressure-retaining components, excluding HVAC duct and fire protection piping, should conform to the requirements of the specifications for materials listed in Section II of the ASME Boiler and Pressure Vessel Code, except that malleable, wrought, or cast iron materials and plastic pipe should not be used. Materials should be compatible with the chemical, physical, and radioactive environment of specific applications during normal conditions and anticipated operational occurrences. If the potential for an explosive mixture of hydrogen and oxygen exists, adequate provisions should be made to preclude buildup of explosive mixtures, or the system should be designed to withstand the effects of an explosion. Manufacturers' material certificates of compliance with material specifications such as those contained in the codes referenced in Table 1 may be provided in lieu of certified materials test reports.

2.3 The portions of the gaseous radwaste treatment system that are intended to store or delay the release of gaseous radioactive waste, including portions of structures housing these systems, should be classified as described in Regulatory Position 5 and designed to the criteria of Regulatory Position 6.

3. SOLID RADWASTE SYSTEM

The solid radwaste system consists of slurry waste collection and settling tanks, spent resin storage tanks, phase separators, and components and subsystems used to solidify radwastes prior to offsite shipment. The solid radwaste handling and treatment system should meet the following criteria.

---

[9] Retention by an intermediate sump or drain tank that is designed for handling radioactive materials and that has provisions for routing to the liquid radwaste system is acceptable.

[9] For a BWR this includes the system provided for treatment of normal offgas releases from the main condenser vacuum system beginning at the point of discharge from the condenser air removal equipment; for a PWR this includes the sytem provided for the treatment of gases stripped from the primary coolant.

3.1 The SSCs of the solid radwaste treatment system should be designed and tested to the requirements set forth in the codes and standards listed in Table 1 supplemented by Regulatory Positions 3.2 and 3.3 of this guide.

3.2 Materials for pressure-retaining components, excluding HVAC duct and fire protection piping, should conform to the requirements of the specifications for materials listed in Section II of the ASME Boiler and Pressure Vessel Code, except that malleable, wrought, or cast iron materials and plastic pipe should not be used. Materials should be compatible with the chemical, physical, and radioactive environment of specific applications during normal conditions and anticipated operational occurrences. Manufacturers' material certificates of compliance with material specifications such as those contained in the codes referenced in Table 1 may be provided in lieu of certified materials test reports.

3.3 Foundations and adjacent walls of structures that house the solid radwaste system should be designed to the natural phenomena and internal and external man-induced hazards criteria given in Regulatory Position 6 of this guide to a height sufficient to contain the maximum liquid inventory expected to be in the building.

3.4 Equipment and components used to collect, process, or store solid radwastes need not be designed to the seismic criteria in Regulatory Position 6 of this guide.

4. ADDITIONAL DESIGN, CONSTRUCTION, AND TESTING CRITERIA

In addition to the requirements inherent in the codes and standards listed in Table 1, the following criteria, as a minimum, should be applicable to SSCs listed in Regulatory Position 6 of this guideline.

4.1 Radioactive waste management SSCs should be designed to control leakage and facilitate access, operation, inspection, testing, and maintenance in order to maintain radiation exposures to operating and maintenance personnel as low as is reasonably achievable. Regulatory Guide 8.8, “Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable,” provides guidelines that are acceptable to the NRC staff on this subject.

4.2 The quality assurance provisions described in Regulatory Position 7 of this guide should be applied.

4.3 Pressure-retaining components of process systems should use welded construction to the maximum practicable extent. Process systems include the first root valve on sample and instrument lines. Flanged joints or suitable rapid-disconnect fittings should be used only where maintenance or operational requirements clearly indicate such construction is preferable. Screwed connections in which threads provide the only seal should not be used except for instrumentation and cast pump body drain and vent connections where welded connections are not suitable. Process lines should not be less than 3/4 inch (nominal). Screwed connections backed up by seal welding, mechanical joints, or socket welding may be used on lines 3/4 inches or larger but less than 2-1/2 inches. For lines 2–1/2 inches and above, pipe welds should be of the butt-joint type. Nonconsumable backing rings should not be used in lines carrying resins or other particulate material. All welding constituting the pressure boundary of pressure-retaining components should be performed in accordance with ASME Boiler and Pressure Vessel Code Section IX.

4.4 Piping systems should be hydrostatically tested in their entirety except (1) at atmospheric tanks where no isolation valves exist, (2) where such testing would damage equipment, and (3) where such testing could seriously interfere with other system or component testing. In the case of (2) and (3), pneumatic testing should be performed. Pressure testing should be performed on as large a portion of the in-place systems as practicable. Testing of piping systems should be performed in accordance with applicable ASME or ANSI codes listed in Table 1.

4.5 In-service inspection and testing provisions should be incorporated to enable periodic evaluation of the operability and required functional performance of active components of the system.

5. CLASSIFICATION OF RADWASTE SYSTEMS FOR DESIGN PURPOSE

Three safety classes, or classifications, are established for radwaste management facilities: RW-IIa (High Hazard), RW-IIb (Hazardous), and RW-IIc (Non-Safety). RW-IIa is the most stringent class and RW-IIc is the least stringent. These classifications were developed primarily for natural phenomena and man-induced hazard design. This safety classification is applied to the SSC as follows.

5.1 For a given structure housing radwaste processing systems or components, if the total design basis unmitigated release (considering the maximum inventory) at the boundary of the unprotected area is greater than 500 millirem per year or the maximum unmitigated exposure to site personnel within the protected area is greater than 5.0 rem per year, the external structures are classified as RW-IIa.

5.2 For a given structure housing radwaste processing systems or components, if the total design basis unmitigated radiological release (considering the maximum inventory) at the boundary of the unprotected area is less than 500 millirem per year and the maximum unmitigated exposure to site personnel within the protected area is less than 5 rem per year, the external structure is classified as RE-IIb.

5.3 Any systems or components in a RW-IIa facility (see Regulatory Position 5.1) that store, process, or handle radioactive waste in excess of the A_1 quantities given in Appendix A, "Determination of A_1 and A_2," to 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," are classified as RW-IIa. These systems or components that process radioactive waste in excess of the A_2 quantities but less than the A_1 quantities given in Appendix A to 10 CFR Part 71 are classified as RW-IIb. All other components are classified as RW-IIc. This classification may be modified for specific radwaste components as discussed in the subsections that follow.

5.4 Any systems or components in a RW-IIb structure (see Regulatory Position 5.2) that are used to store or process specified radioactive waste in excess of the A_1 quantities given in Appendix A to 10 CFR Part 71 are classified as RW-IIb. All other systems or components are classified as RW-IIc.

The unprotected area boundary mentioned in Regulatory Position 5.1 is shown in Figure 1. A flowchart of the Safety Classification Process is shown in Figure 2.

6. NATURAL PHENOMENA AND MAN-INDUCED HAZARDS DESIGN FOR RADWASTE MANAGEMENT SYSTEMS AND STRUCTURES

6.1 General Design Criteria

Solid, liquid, and gaseous radwaste SSCs described in Regulatory Positions 1, 2, and 3 for natural phenomena and internal and external man-induced hazards should be evaluated as put forth in this position.

6.1.1 The natural phenomena and internal and external man-induced hazards demand definition is as given in Table 2.

6.1.2 The natural phenomena and internal and external man-induced hazards design load combinations are as given in Table 3.

6.1.3 The natural phenomena and internal and external man-induced hazards should meet capacity criteria as defined in Table 4.

The acceptability evaluation should be based on the requirements of the codes and standards given in Table 1, using the capacity criteria in Table 4.

6.2 Buildings Housing Radwaste Systems

6.2.1 Regardless of its safety classification, the foundation and walls up to the spill height of the building housing the radwaste systems should be classified RW-IIa and they are to be designed to the criteria of Tables 1, 2, 3, and 4.

For classifications RW-IIb and RW-IIc, the staff recommends that all SSCs be designed at least for local building code seismic base shear requirements. In the absence of such local building criteria, it is recommended that the guidance of Volume 2 of the Standard Uniform Building Code 1997,[8] and American Society of Civil Engineers ASCE 7-957, "Minimum Design Loads for Buildings and Other Structures,"[9] be used as noted in Table 2 of this regulatory guide.

6.2.2 In lieu of the criteria and procedures referenced in Regulatory Position 6, optional shield structures constructed around and supporting the radwaste systems may be erected to protect the radwaste systems from effects of failure of the housing structure. If this option is adopted, the procedure described in Regulatory Position 6.2.1 need only be applied to the shield structures.

7. QUALITY ASSURANCE FOR RADWASTE MANAGEMENT SYSTEMS

Since the impact of these systems on safety is limited, the extent of control required by Appendix B to 10 CFR Part 50 is similarly limited. To ensure that systems will perform their intended functions, a quality assurance program sufficient to ensure that all design,

[9] Copies may be obtained from the International Conference of Building Officials, 5360 Workman Mill Road, Whittier, CA 90601-2798.

[9] Copies may be obtained from the American Society of Civil Engineers, 345 East 47th Street, New York, NY 10017-2398.

construction, and testing provisions are met should be established and documented. A quality assurance program acceptable to the NRC staff is presented in ANSI N199-1993/ANS-55.2, "Liquid Radioactive Waste Processing System for Pressurized Water Reactor Plants."

Section 4.3, "Quality Assurance," of ANSI N199-1993/ANS 55.2 provides quality assurance guidance that is acceptable to the NRC staff for the system designer and procurer and for the system constructor. The design, procurement, fabrication, and construction activities should conform to the quality control provisions of the codes and standards specified in Table 1 of this draft guide. In addition, or where not covered by the referenced codes and standards, sufficient records should be maintained to furnish evidence that quality assurance measures are being implemented. The records should include results of reviews and inspections and should be identifiable and retrievable.

D. IMPLEMENTATION

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

This proposed revision has been released to encourage public participation in its development. Except in those cases in which the applicant or licensee proposes an acceptable alternative method for complying with specified portions of the NRC's regulations, the method described in the active guide reflecting public comments will be used in the evaluation of a licensee's or applicant's design, construction, installation, and testing of radioactive waste management facilities, and in the evaluation of structures, systems, and components in light-water-cooled nuclear power plants.

Table 1 - Codes and Standards for the Design of SSC in Radwaste Facilities[1]				
Component	**Design and Construction**	**Materials**	**Welding**	**Inspection and Testing**
Structures - Concrete	ACI-318 or ACI 349[(2)(3)]	ACI-318 or ACI 349	ACI-318 or ACI 349	ACI-318 or ACI 349
Structures-Steel (Hot Rolled)	AISC-ASD or AISC LFRD or AISC N-690(S327) [(2)(4)]	ASTM-A36	AWS-D1.1	AISC Standards and AWS Standards
Structures-Steel (Cold Formed)	AISI-CFSDM	ASTM-A500	AWS-D1.3, D9.1	AISC Standards and AWS Standards
Piping & Valves	ANSI/ASME B31.3 [(5)(6)]	ASME-Sec. II[(7)]	ASME, Sec. IX	ANSI/ASME B31.3
Atmospheric Tanks	API-650	ASME Sec. II	ASME, Sec. IX	API-620
Tanks (0-15 psig)	API-620	ASME Sec. II	ASME, Sec. IX	API-650
Pressure Vessels and Tanks (>15 psig)	ASME BPVC Div. 1 or Div. 2	ASME Sec. II	ASME, Sec. IX	ASME Section VIII, Div. 1 or 2
Pumps	API-610; API-674; API-675; ASME BPVC Section VIII, Div. 1 or Div. 2	ASTM or ASME Sec. II	ASME, Sec. IX	ASME BPVC Code Section III, Class 3[(8)]
Heat Exchangers	TEMA STD, 7th Edition; ASME BPVC Section VIII Div. 1 or Div. 2	ASTM-B359 or ASME Sec. II	ASME, Sec. IX	ASME Section VIII, Div. 1 or 2
HVAC Systems	SMACNA Stds. [(9)(6)]	ASTM	AWS-D1.1, D1.3, D9.1	SMACNA Stds
Conduit and Cable Trays	ANSI/NEMA Standards	ASTM/NEMA	AWS-D1.1, D1.3, D9.1,	ANSI/NEMA Stds.
Fire Protection Systems	NFPA-13[(10)(6)]; NFPA-14	ASTM-A795	AWS-D1.1, D1.3, D9.1, D10.9	NFPA-13

Footnotes for Table 1:

(1) For a comprehensive lists of codes and standards referenced in Tables 1-4 see Appendix A to this regulatory guide.
(2) Applicable to structure enclosing or supporting pressurized gaseous waste or liquid waste systems up to spill height. Also applicable to solid waste facility foundations slab and connected wall or column sections up to a height of 10.0 feet.
(3) Appropriate load combinations and capacity criteria for component designs are specified in Table 3 of this regulatory guide.
(4) Class RW-IIa Structures are to use ACI-349 and/or AISC N-690(S327) as applicable.

(5) Class RW-IIa and RW-IIb Piping Systems are to be designed as category "M" systems.
(6) Classes RW-IIa, RW-IIb, and RW-IIc are discussed in Regulatory Position 5 of this regulatory guide.
(7) ASME BPVC Section II required for Pressure Retaining Components.
(8) ASME Code Stamp, material traceability, and the quality assurance criteria of ASME BPVC, Section III, Div. 1, Article NCA are not required. Therefore, these components are not classified as ASME Code Class 3.
(9) Class RW-IIa and RW-IIb HVAC systems are to use SMACNA "Seismic Restraint Manual Guides for Mechanical Systems."
(10) Class RW-IIa and RW-IIb Fire Protection Systems are to be designed to NFPA-13, Section 4-14.4.3.

Table 2 - Natural Phenomena and External Man-Induced Hazard Design Criteria for Safety Classification			
Loading	**Classification**		
	RW-IIa (High Hazard)	**RW-IIb (Hazardous)**	**RW-IIc (Non-Safety)**
Earthquake	OBE or 1/2 SSE	ASCE 7-95, Category III[1] or UBC 97, Category 2[2]	ASCE 7-95, Category II[1] UBC-97, Category 4[2]
Wind	ASCE 7-95, Category III[1]	ASCE 7-95, Category III[1]	ASCE 7-95, Category II[1]
Tornado	ANS 2.3 at a Probability of 1 x 10^{-5}/yr or three-fifths of Criteria in Regulatory Guide 1.76, Table 1.	ASCE 7-95, Category III[1]	ASCE 7-95, Category II[1]
Tornado Missile **from SRP Section 3.5**	A. 75 lbs, 3 in. nominal diameter sch. 40 pipe. Maximum velocity 0.4 x max. wind speed horizontal and 0.28 times max. wind speed vertical direction.[3] B. Automobile wt. 4000 lbs with frontal area of 20.0 sq. ft. traveling horizontally at 0.2 times maximum wind speed horizontally and 0.14 times maximum wind speed up to a height of 35 ft above grade[4].	Not Required	Not Required
Flood	Regulatory Guide 1.59, one-half of the PMF.(5).	ASCE 7-95, Category III[1]	ASCE 7-95, Category II[1]
Precipitation [6] (Rain, Snow)	ANS 2.6 at Probability of 1 x 10^{-3}/yr or Regulatory Guide 1.59, one-half precipitation specific for the PMF[5]	ASCE 7-95, Category III[1]	ASCE 7-95, Category II[1]
Accidental Explosion Fixed Facility	To Be Evaluated on a Case-by-Case Basis, Plant-Specific Definition	Not Required	Not Required
Accidental Explosion Transportation Vehicle	See Regulatory Guide 1.91	Not Required	Not Required
Malevolent Vehicle Assault	Regulatory Guide 5.68 or Plant Specific Definition	Not Required	Not Required
Small Aircraft Crash	Plant-Specific Definition	Not Required	Not Required

Footnotes for Table 2:

(1) ASCE 7-95, Table 1-1
(2) UBC-97, Table 16-k
(3) Penetrating-type missile.
(4) Impact-type missile.
(5) PMF = Probable Maximum Flood.
(4) Resistance to lightening strike should also be included in the design.

Table 3 - Design Load Combinations				
System, Structure, Component (SSC)	**Service Levels**	**SSC Safety Class**		
		RW - IIa	**RW- IIb**	**RW- IIc**
External Structures (Concrete, Steel, Component Support Structures[1]) External Conduits and Cable Trays	A (Normal)	D + L + To	D + L + To	D + L + To
	B (Severe; Upset)	D + L + Tb D + L + To + Eo D + L + To + W + R D + L + To + F	D + L + Tb D + L + To + E'o D + L + To + W + R D + L + To + F	D + L + Tb D + L + To + E"o D + L + To + W + R D + L + To + F
	D (Abnormal Extreme; Faulted)	D + L + To + W_t D + L + To + V_m D + L + To + A_c D + L + T_a + A_D D + L + T_a + A	N/R	N/R
Internal Structures (Concrete, Steel Component Support Structures[1]) Internal Conduit and Cable Trays	A (Normal)	D + L + To	D + L + To	D + L + To
	B (Severe, Upset)	D + L + T_b D + L + T_o + E_o D + L + T_o + F	D + L + T_b D + L + T_o + E_o D + L + T_o + F	D + L + T_b D + L + T_o + E_o D + L + T_o + F
	D (Abnormal Extreme; Faulted)	D + L + T_a + A_D D + L + T_a + A	N/R	N/R
Pressure Retaining Components[2] (Piping, Valves, Pressure Vessels, Atmosphere, Tanks, 0-15 psig Tanks, Pumps Heat Exchangers) HVAC Systems Fire Protection Systems	A (Normal)	P_D + D + D_m T_o	P_d + D + D_M T_o	P_D + D + D_m T_o
	B (Severe, Upset)	P_o + D + D_m + E_o P_o + D + D_m + W + R P + D + D_m + F T_b	P_o + D + D_m + E_o P_o + D + D_m + W + R P + D + D_m + F T_b	P_o + D + D_m + E_o P_o + D + D_m + W + R P + D + D_m + F T_b
	D (Abnormal, Extreme Faulted)	P + D + D_m + W_t P_o + D + D_m + Y_m P_o + D + D_m + A_c P_a + D + D_m + A_D P_a + D + D_m + A	N/R	N/R

Nomenclature:

D	=	Dead Loads
L	=	Live loads
T_o	=	Normal Operating Thermal Expansion Loads
T_b	=	Upset Thermal Expansion Loads
T_a	=	Accident Thermal Loads

E_o	=	OBE or ½ SSE Seismic Loads
E'_o	=	Seismic Loads per Table 2 For RW-IIb Components
E''_o	=	Seismic Loads per Table 2 For RW-IIc Components
W	=	Wind Load Including Missile Effects
R	=	Precipitation Loads (Rain, Snow)
F	=	Flood Loadings
W_t	=	Tornado Loads Including Missile Effects
V_m	=	Malevolent Vehicle Assault Loads
A_c	=	Aircraft Crash Loads
A_D	=	Design Basis Accident Loads
A	=	Other Accident Loads
P_D	=	Design Pressure
P_b	=	Maximum Upset Pressure
P_o	=	Normal Operating Pressure
P_a	=	Applicable Accident Pressure
D_M	=	Design Mechanical Loads

Footnotes:

(1) Components support structures include supporting elements for piping, tanks, vessels pumps, heat exchangers, conduits, cable trays, HVAC systems, fire protection systems, etc.

(2) For most pressure-retaining components, primary and secondary stresses are evaluated separately to separate criteria. The design code of record is the controlling document in the establishment of the primary and secondary stress combination and evaluation methods.

Table 4 - SSC Design Capacity Criteria				
Code or Standard	**Service Level**	**Capacity Criteria**		
		RW-IIa	**RW-IIb**	**RW-IIc**
ACI-349	A, B, D	Load Factors and Capacity Criteria per ACI-349 as modified by Regulatory Guide 1.143	N/A	N/A
ACI-318	A, B, D	Load Factors and capacity criteria per ACI-349 as modified by Regulatory Guide 1.142. All other design per ACI-318 criteria	Load Factors and capacity criteria per ACI-349 as modified by Regulatory Guide 1.142. All other design per ACI-318 criteria	Load Factors and capacity criteria per ACI-349 as modified by Guide 1.142. All other design per ACI-318 criteria
AISC-N690	A	Capacity criteria Table Q 1.5.7.1 for normal loads.	Capacity criteria Table Q 1.5.7.1 for normal loads.	Capacity criteria Table Q 1.5.7.1 for normal loads
	B	Capacity criteria 1.33 times that for Level A loads	Capacity criteria 1.33 times that for Level A loads	Capacity criteria 1.33 times that for Level A loads
	D	Capacity criteria per Table Q.1.5.7.1 for Abnormal Extreme Loads	N/R	N/R
AISC-ASD	A	Capacity Criteria per “Specification for Structural Steel Buildings Stress Design and Plastic Design, Part 1"	Capacity Criteria per “Specification for Structural Steel Buildings Stress Design and Plastic Design, Part 1"	Capacity Criteria per “Specification for Structural Steel Buildings Stress Design and Plastic Design, Part 1"
	B	Capacity Criteria 1.33 times that for Level A loads.	Capacity Criteria 1.33 times that for level A loads.	Capacity Criteria 1.33 times that for level A loads.
	D	Capacity Criteria per “Specification for Structural Steel Buildings Stress Design and Plastic Design, Part 2".	N/R	N/R

Table 4 - SSC Design Capacity Criteria (continued)				
Code or Standard	**Service Level**	**Capacity Criteria**		
		RW-IIa	**RW-IIb**	**RW-IIc**
AISI-CFSDM	A	Capacity criteria per "Specification for the Design of Cold Formed Steel Structural Members"	Capacity criteria per "Specification for the Design of Cold Formed Steel Structural Members"	Capacity criteria per "Specification for the Design of Cold Formed Steel Structural Members"
	B	Capacity criteria 1.33 times Level A	Capacity criteria 1.33 times Level A	Capacity criteria 1.33 times Level A
	D	Capacity criteria 1.6 times Level A	N/R	N/R
ANSI/ASME B31.3	A	B31.3 Design Load Capacities	B31.3 Design Load Capacities	B31.3 Design Load Capacities
	B	B31.3 Occasional Load Capacities	B31.3 Occasional Load Capacities	B31.3 Occasional Load Capacities
	D	1.8 Times B31.3 Occasional Load Capacities	N/R	N/R
ASME BPVC, Section VIII, Div. 1 or Div. 2	A	ASME BPVC, Section VIII, Div. 1 or Div. 2 Design Capacities	ASME BPVC, Section VIII, Div. 1 or Div. 2 Design Capacities	ASME BPVC, Section VIII, Div. 1 or Div. 2 Design Capacities
	B	Capacity criteria 1.2 Times Level A criteria	Capacity criteria 1.2 Times Level A criteria	Capacity criteria 1.2 Times Level A criteria
	D	Capacity criteria 1.8 times Level A criteria	N/R	N/R
SMACNA Stds.[(1)]	A	SMACNA Design Criteria	SMACNA Design Criteria	SMACNA Design Criteria
	B	SMACNA Design Criteria	SMACNA Design Criteria	SMACNA Design Criteria
	D	(1) Duct support members to meet capacity criteria for AISI-DFSDM or AISC-ASD for Level D Loads (2) Ducting stresses to be less than the material yield stress and shall be limited to 2/3 critical buckling	N/R	N/R
NFPA-13[(1)]	A	NFPA Design Criteria	NFPA Design Criteria	NFPA Design Criteria
	B	NFPA Design Criteria for Earthquake and Wind Loads	NFPA Design Criteria for Earthquake and Wind Loads	NFPA Design Criteria for Earthquake and Wind Loads

Table 4 - SSC Design Capacity Criteria (continued)				
Code or Standard	**Service Level**	**Capacity Criteria**		
		RW-IIa	**RW-IIb**	**RW-IIc**
	D	(3) Support members to meet capacity criteria for AISI-CFSDM or AISC-ASD for Level D Loads (4) Piping Stresses to meet the B31.3 Level D Capacity Criteria	N/R	N/R
ANSI/NEMA STDS (Cable Trays/Conduit)	A	ANSI/NEMA Design Criteria for Normal Loads	ANSI/NEMA Design Criteria for Normal Loads	ANSI/NEMA Design Criteria for Normal Loads
	B	ANSI/NEMA Design Criteria for Wind and Seismic Loads	ANSI/NEMA Design Criteria for Wind and Seismic Loads	ANSI/NEMA Design Criteria for Wind and Seismic Loads
	D	(5) Support members to meet capacity criteria for AISI-CFSDM or AISC-ASD for Level D Load (6) Trays and members to meet the capacity criteria for AISI-CFSDM for Level D Loads	N/R	N/R
Pumps (API Series STDS)	A	Applicable API Standards for Design Criteria	Applicable API Standards for Design Criteria	Applicable API Standards for Design Criteria
	B	ASME QME-1 1997	ASME QME-1 1997	ASME QME-1 1997
	D	ASME QME-1 1997	N/R	N/R
API-620/650 (Tanks)	A	API Design Capacity Criteria	API Design Capacity Criteria	API Design Capacity Criteria
	B	Capacity Criteria per ASME-BPVC - Section III, NC-3800, NC-3900 for Level B loads. All other Design per API Criteria.	Capacity Criteria per ASME-BPVC - Section III, NC-3800, NC-3900 for Level B loads. All other Design per API Criteria.	Capacity Criteria per ASME-BPVC - Section III, NC-3800, NC-3900 for Level B loads. All other Design per API Criteria.
	D	Capacity Criteria per ASME-BPVC - Section III, NC-3800, NC-3900 Level D Loads. All other Design per API Criteria.	N/R	N/R

Footnotes for Table 4:

(1) For Level A and B Loads, the Design Criteria is primarily a "design by rule" approach versus a specific analysis criteria.

N/A= Not Applicable

N/R = Not Required

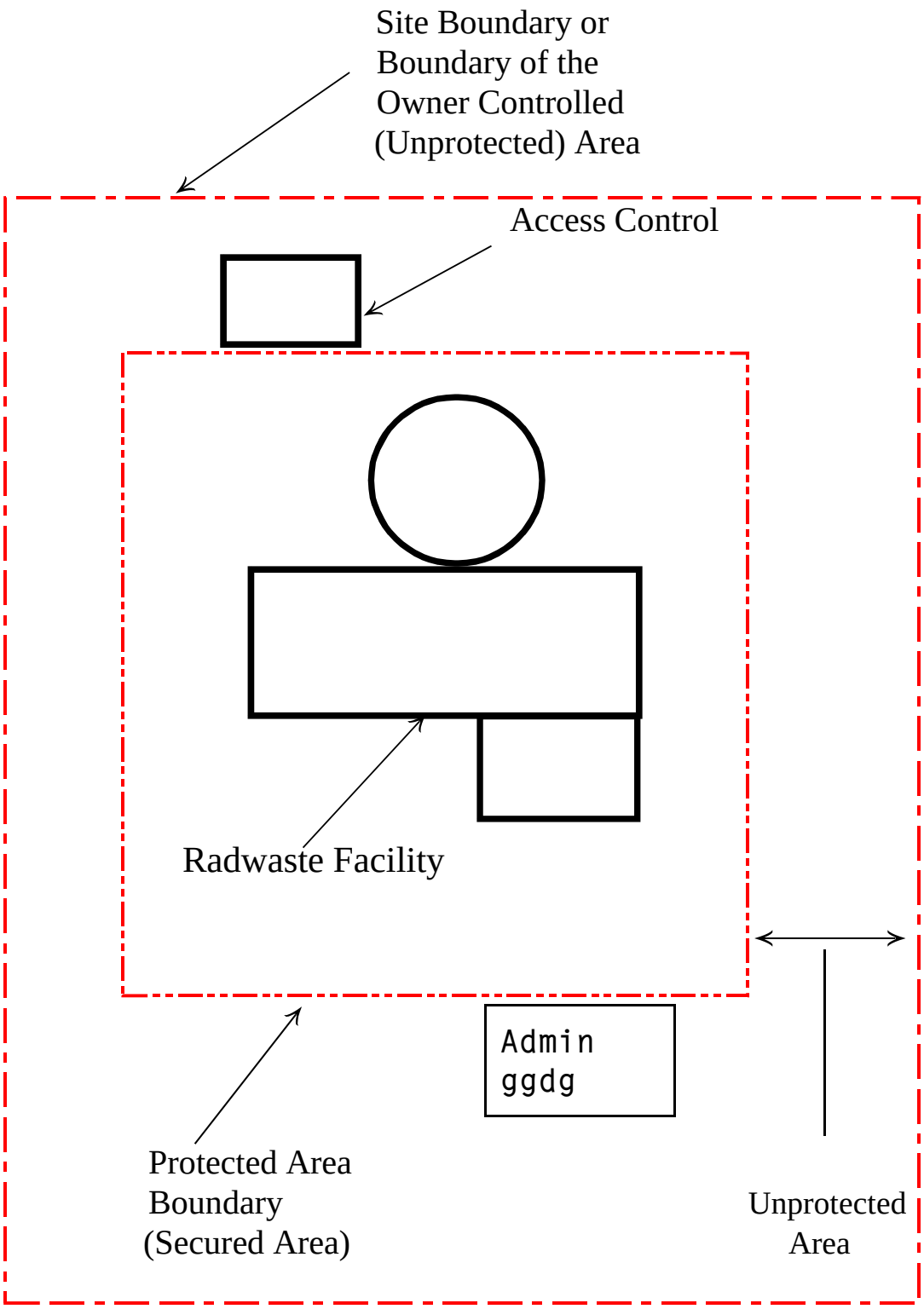

Figure 1 - Informational Schematic Describing
Protected and Unprotected Areas

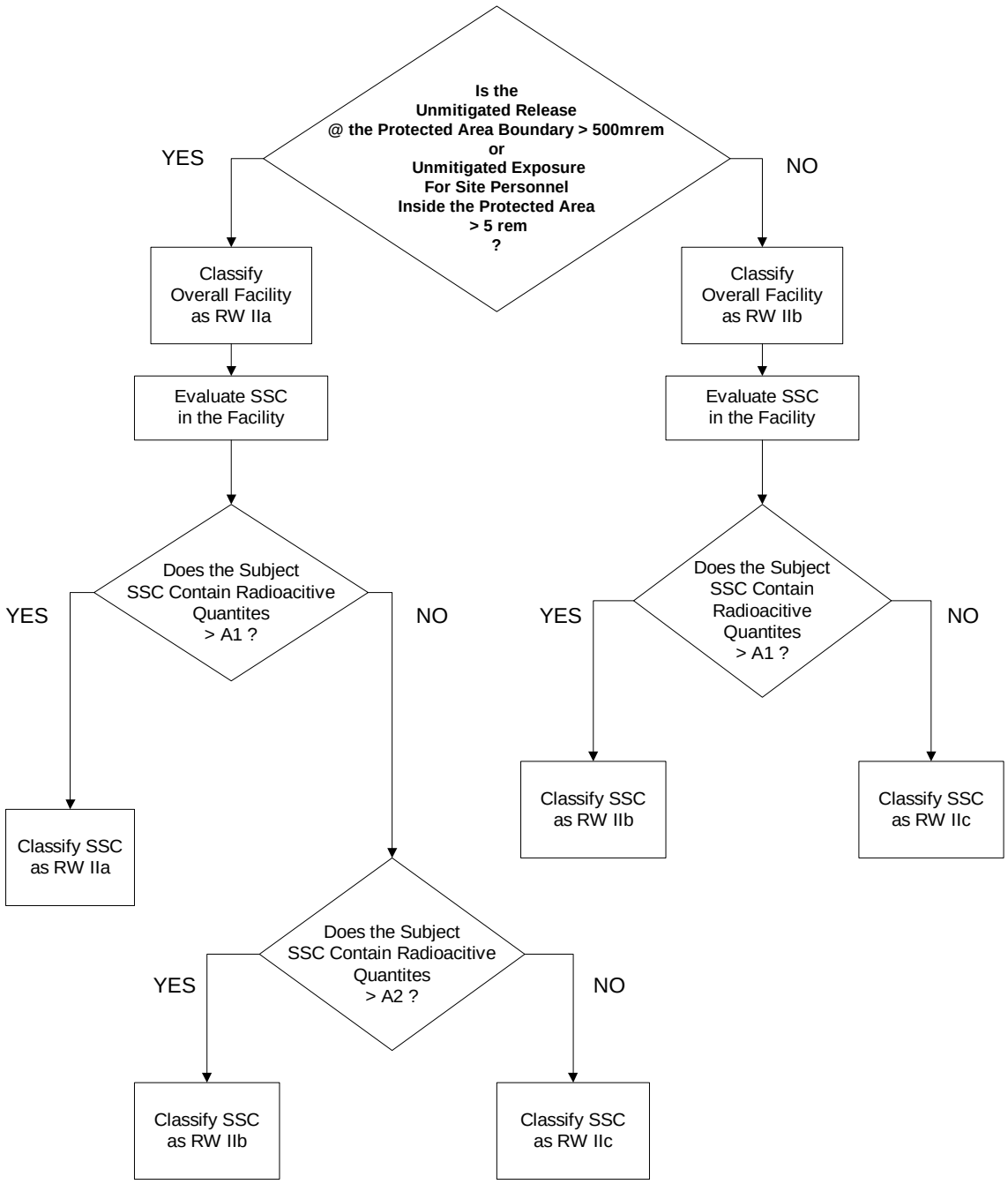

Figure 2 - Flowchart of Safety Classification Process

Appendix A
INDUSTRY CODES AND STANDARDS

American Concrete Institute, ACI-318, "Building Code Requirements for Reinforced Concrete" (ACI 318-89, Revised 1999), 1999.

American Concrete Institute, ACI-349, “Code Requirements for Nuclear Safety Related Concrete Structures," 1997.

American Institute of Steel Construction, N690 (S327), “Nuclear Facilities, Steel Safety-Related Structures For Design and Fabrication,” 1984.

American Institute of Steel Construction, “Specifications for Structural Steel Buildings, Manual of Steel Construction,” 2nd Edition, 1995.

American Institute of Steel Construction, "Specifications for Structural Steel Buildings, Allowable Stress Design and Plastic Design, Manual of Steel Construction,” 9th Edition, 1993.

American Iron and Steel Institute, SG-673, “Specification for the Design of Cold-Formed Steel Structural Members,” August 1986 with December 1989 Addendum.

American Nuclear Society, "Gaseous Radioactive Waste Processing Systems for Light-Water Cooled Reactor Plants," ANSI/ANS-55.4-1993.

American Nuclear Society, "Liquid Radioactive Waste Processing System for Light Water Cooled Reactor Plants," ANSI/ANS 55.6-1993.

American Nuclear Society, "Solid Waste Processing System for Light Water Cooled Reactor Plants," ANSI/ANS-55.1-1992.

American Petroleum Institute, 610, “Centrifugal Pumps for Petroleum, Heavy Duty Chemical, and Gas Industry Services,” 1995.

American Petroleum Institute, 620, “Design and Construction of Large, Welded, Low-Pressure Storage Tanks, 1990.

American Petroleum Institute, 650, “Welded Steel Tanks for Oil Storage,” 1998.

American Petroleum Institute, 674, “Positive Displacement Pumps-Reciprocating,” 1995.

American Petroleum Institute, 675, “Positive Displacement Pumps-Controlled Volume,” 1994.

American Society of Civil Engineers, 7-95, "Minimum Design Loads for Buildings and Other Structures," 1995.

American Society for Mechanical Engineers, Boiler and Pressure Vessel Code, Section II, “Material Specification,” 1999.

American Society for Mechanical Engineers, Boiler and Pressure Vessel Code, Section VIII, “Pressure Vessels,” 1999.

American Society for Mechanical Engineers, Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualification," 1999.

American Society for Mechanical Engineers, Boiler and Pressure Vessel Code, B31.3, "Process Piping," 1999.

American Society for Testing & Materials, A36-00, "Standard Specification for Carbon Structural Steel," 2000.

American Society for Testing & Materials, A500-99, "Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes," 1999.

American Society for Testing & Materials, A795-97, "Standard Specification for Black and Hot-Dipped Zinc-Coated Welded and Seamless Steel Pipe for Fire Protection Use," 1997.

American Society for Testing & Materials, B359-98, "Standard Specification for Copper and Copper-Alloy Seamless Condenser and Heat Exchanger Tubes With Integral Fins," 1998.

American Society of Mechanical Engineers, QME-1-1997, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants," December 31, 1997.

American Welding Society, D1.1, "Structural Welding Code-Steel," 17th Edition, 2000.

American Welding Society, D1.3, "Structural Welding Code-Sheet Steel," 1998.

American Welding Society, D9.1, "Sheet Metal Welding Code," 1990.

American Welding Society, D10.9, "Specification for Qualification of Welding Procedures and Welders for Piping and Tubing," 1980.

National Electrical Manufacturers Association, Publication Number TC2, "Electrical Polyvinyl Chloride(PVC) Tubing and Conduit," 1998.

National Electrical Manufacturers Association, Publication Number VE1, "Metal Cable Tray Systems," 1996.

National Fire Protection Association, NFPA 13, "Installation of Sprinkler Systems," 1999.

National Fire Protection Association, NFPA 14, "Standard for the Installation of Standpipe Fire Protection, Private Hydrant, and Hose Systems," 2000.

Sheet Metal and Air Conditioners Contractor National Association, "Seismic Restraint Manual Guideline for Mechanical Systems," 2nd Edition, 1998.

Tubular Exchanger Manufacturers Association, "Standards of the Tubular Exchanger Manufacturers Association, Eighth Edition," 2000.

The Codes and Standards are available from:

American Concrete Institute (ACI),

American Institute of Steel Construction (AISC), One E. Wacker Drive, Suite 3100, Chicago, IL 60601-2001.

American Iron and Steel Institute (AISI),1101 17th Street, NW, Washington, DC 20036.

American Nuclear Society (ANS), 555 N. Kensington Avenue, La Grange Park, IL 60525.

American Petroleum Institute (API), 1220 L Street, NW, Washington, DC 20005.

American Society of Mechanical Engineers (ASME), 345 East 47th Street, New York, NY 10017.

American Society for Testing & Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

American Welding Society (AWS), 550 NW LeJeune Road, Miami, FL 33126.

National Electrical Manufacturers Association (NEMA), 1300 N. 17th Street, Rosslyn, VA 22209.

National Fire Protection Association (NFPA), Inc., Battery March Park, Quincy, MA 02269.

Sheet Metal and Air Conditioners Contractor National Association (SMACNA), 4201 Lafayette Center Drive, Chantilly, VA 20153-1230.

Tubular Exchanger Manufacturers Association (TEMA), 25 N. Broadway, Tarrytown, NY 10591.

REGULATORY ANALYSIS

1. STATEMENT OF PROBLEM

Revision 1 of Regulatory Guide 1.143, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants," was issued in October 1979. This guide furnishes design guidance acceptable to the NRC staff related to seismic and quality group classification and quality assurance provisions for radioactive waste management structures, systems, and components. Further, it describes provisions for controlling releases of liquids containing radioactive materials, e.g., spills or tank overflows, from all plant systems outside reactor containment. Regulatory Guide 1.143 encompassed the design of buildings, structures, systems, and components and referred to several design and construction codes and standards, such as American National Standards Institute (ANSI) N197-1976, ANSI N199-1976, American Nuclear Society (ANS) ANS 55.1-1979, ANS 55.4-1979, American Concrete Institute ACI-318-1977, and American Institute of Steel Construction AISC-1969.

These references are now obsolete or have been superseded by newer ANSI and ANS radioactive waste facility design standards. ANS has recently issued ANS-55.1-92, ANS-55.4-93, and ANS-55.6-93, which are the industry consensus standards currently applicable to the overall design of radioactive waste facilities. In addition, several other referenced codes such as "Building Code and Commentary," ACI-318-77; or "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings," AISC-1969, have been updated and modified since the issuance of Revision 1 of Regulatory Guide 1.143. Also, there has been increased understanding of, and corresponding changes in relation to, radiation exposure and monitoring and quality assurance needs for the design and construction of radioactive waste facilities and the associated systems, structures and components.

The Operating Basis Earthquake (OBE), as was used in Revision 1 of Regulatory Guide 1.143 as the design basis, creates further difficulties. In 1997, the NRC staff revised 10 CFR 100.23 and added Appendix S to 10 CFR Part 50 that essentially state that, if the review level earthquake (OBE) is defined as less than 1/3 of the safe-shutdown earthquake (SSE), no explicit design analysis for the OBE level earthquake will be required. In other words, the revised criteria have effectively eliminated the OBE as a design basis seismic event. In recent staff licensing actions, the Standard (Advanced) Reactor Designs used only a SSE event as the design basis, consistent with the methodology in the recent revision to 10 CFR 100.23 and the addition of Appendix S to 10 CFR Part 50. Thus, Revision 1 of Regulatory Guide 1.143 was almost not usable for standard reactor designs.

The staff maintains that recommendations based on the latest editions of the Design and Construction Standards and Codes mentioned above and reference to current quality assurance standards and NRC regulations provides a means to achieve better evaluation of radioactive waste management systems, structures, and components installed in light water-cooled nuclear power plants.

2. OBJECTIVES

The objective of the regulatory action is to update NRC guidance on the design, construction, and quality assurance of radioactive waste management systems, structures, and components installed in light-water-cooled nuclear power plants.

3. ALTERNATIVES AND CONSEQUENCES OF PROPOSED ACTION

3.1 Alternative 1 - Do Not Revise Regulatory Guide 1.143

Regulatory Guide 1.143 would not be revised and licensees would continue to rely on the current version of Regulatory Guide 1.143 with references from the late 1960s and mid 1970s. The staff acknowledges that many licensees who are presently involved in the design of radioactive waste management systems, structures, and components installed in light-water-cooled nuclear power plants, as a matter of practice, already rely on more recent editions of ANSI and ANS radioactive waste facility design standards and ACI and AISC codes.

3.2 Alternative 2 - Update Regulatory Guide 1.143

The NRC staff has identified the following consequences associated with adopting Alternative 2.

3.2.1 Licensees will use the latest consensus standards available, thereby improving design, evaluation, and quality assurance of radioactive waste management systems, structures, and components. The staff views the latest standards as improved because they incorporate the latest technology and knowledge on the subject.

3.2.2 Regulatory efficiency will be improved by reducing uncertainty as to what is acceptable and by encouraging consistency in the design, evaluation, and quality assurance of radioactive waste management systems, structures, and components. The benefits to both the NRC and industry will be to the extent this occurs. An updated regulatory guide would facilitate NRC review because licensee submittals should be more predictable and consistent analytically. Similarly, licensee's adherence to the latest consensus standards should benefit licensees by reducing the likelihood for follow-up questions and possible revisions to licensees' plans.

3.2.3 An updated regulatory guide could result in cost savings for both the NRC and industry. From the NRC's perspective, relative to the baseline, NRC will incur one-time incremental costs to develop the regulatory guide for public comment and to finalize the regulatory guide. However, the NRC should also realize cost savings associated with the review of licensee submittals. In the staff's view, the continuous and on-going cost savings associated with these reviews should more than off-set this one-time cost.

On balance, it is expected that industry would realize a net savings, as their one-time incremental cost to review and comment on a revised regulatory guide would be more than compensated for by the efficiencies (e.g., reduced follow-up questions and revisions) associated with each licensee submittal.

3.2.4 The use of industry consensus standards that are already being used by licensees would enhance the continued use of the guidance contained in ANS-55.1-92, ANS-55.4-93, and ANS-55.6-93, thereby avoiding costs related to a "new" agency-prepared standard. This approach would also comply with the Commission's directive that standards developed by consensus bodies be utilized per Public Law 104-113, "National Technology and Transfer Act of 1995."

4. CONCLUSION

Based on this regulatory analysis, it is recommended that the NRC revise Regulatory Guide 1.143. The staff concludes that the proposed action will reduce unnecessary burden on both the NRC and its licensees, and it will result in an improved process for the design, evaluation, and quality assurance of radioactive waste management systems, structures, and components. Furthermore, the staff sees no adverse effects associated with a revision to Regulatory Guide 1.143.

BACKFIT ANALYSIS

The regulatory guide does not require a backfit analysis as described in 10 CFR 50.109(c) because it does not impose a new or amended provision in the NRC's rules or a regulatory staff position interpreting the NRC's rules that is either new or different from a previous applicable staff position. In addition, this regulatory guide does not require the modification or addition to systems, structures, components, or design of a facility or the procedures or organization required to design, construct, or operate a facility. Rather, a licensee or applicant may select a preferred method for achieving compliance with a license or the rules or the orders of the Commission as described in 10 CFR 50.109(a)(7). This regulatory guide provides an opportunity to use industry-developed standards, if that is a licensee's or applicant's preferred method.

Accession Number
for DG-1100:
ML003740970