



# REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

## REGULATORY GUIDE 3.53 (Task CE 037-4)

### APPLICABILITY OF EXISTING REGULATORY GUIDES TO THE DESIGN AND OPERATION OF AN INDEPENDENT SPENT FUEL STORAGE INSTALLATION

#### A. INTRODUCTION

The storage of spent fuel in an independent spent fuel storage installation (ISFSI) pending its ultimate disposal is a new step in the nuclear fuel cycle that is licensed pursuant to 10 CFR Part 72, "Licensing Requirements for the Storage of Spent Fuel in an Independent Spent Fuel Storage Installation." The conventional method for such storage is in water basins embedded in the ground with their water surface approximately at grade level. Other methods using dry storage are also being considered. These methods may include air-cooled canyons or vaults, underground caissons or dry wells, or surface-storage casks or silos. Applicants may determine that other regulatory guides contain useful information for particular situations. Potential use of other guides may be discussed with the NRC staff.

This regulatory guide identifies existing regulatory guides that may be applicable in whole or in part to the design and operation of an ISFSI. Since the different modes of storage vary widely in design, the guides cited will obviously not all be applicable to all design technologies. Also, as a general rule, the technologies and operating conditions involved in the receipt and storage of aged spent fuel (i.e., spent fuel that has undergone at least 1 year of decay since removal from a reactor core) are not only much less complex and dynamic than those of production and utilization facilities (i.e., reactor and reprocessing facilities), but they are also less complex and dynamic than the technologies and conditions involved in the receipt and storage of spent fuel in reactor basins designed to receive spent fuel directly from a reactor core after a decay of a few days or less. The referenced guides are useful not only because the methods of design and operation cited have been examined by the NRC staff and found to be appropriate as a means of meeting the requirements of NRC regulations, but also because these guides are familiar to licensees and applicants. Thus, while the guides may exceed the requirements of Part

72 in some cases (in particular, those guides written with reference to power reactors), they can be of benefit to applicants and licensees who already have experience with the solutions endorsed in them and who may wish to apply familiar solutions rather than develop alternative solutions less certain of being acceptable to the NRC staff.

#### B. DISCUSSION

Existing regulatory guides were examined for their potential applicability to the design and operation of an ISFSI that may use either a wet or dry mode of storage. The specific revision of each guide that may be applicable, in whole or in part, is listed in the tables of this guide. This guide will be updated as referenced guides are revised.

The user and staff must exercise discretion in using all of the detailed information associated with each regulatory position cited, e.g., not all appendices and examples contained in the cited guides are applicable to an ISFSI. If the guidance in a guide written specifically for an ISFSI differs from that in a guide developed for another facility, (e.g., a Division 1 guide), the guidance in the guide specific to an ISFSI should be followed.

#### C. REGULATORY POSITION

Tables 1, 2, and 3 list existing regulatory guides that may be applicable to an ISFSI. Table 1 identifies guides applicable to ISFSI design and Table 2 identifies guides applicable to ISFSI operation. Table 3 identifies guides that are specific to an ISFSI. The guides are listed in the tables by number, title, and revision under general subjects that are arranged alphabetically. Relevant regulatory positions in each guide are identified and briefly described. In Tables 1 and 2, the portions of the NRC regulations addressed by the regulatory positions are also identified and other pertinent information is provided.

#### USNRC REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public methods acceptable to the NRC staff of implementing specific parts of the Commission's regulations, to delineate techniques used by the staff in evaluating specific problems or postulated accidents, or to provide guidance to applicants. Regulatory Guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

This guide was issued after consideration of comments received from the public. Comments and suggestions for improvements in these guides are encouraged at all times, and guides will be revised, as appropriate, to accommodate comments and to reflect new information or experience.

Comments should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch.

The guides are issued in the following ten broad divisions:

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. Power Reactors                 | 6. Products                       |
| 2. Research and Test Reactors     | 7. Transportation                 |
| 3. Fuels and Materials Facilities | 8. Occupational Health            |
| 4. Environmental and Siting       | 9. Antitrust and Financial Review |
| 5. Materials and Plant Protection | 10. General                       |

Copies of issued guides may be purchased at the current Government Printing Office price. A subscription service for future guides in specific divisions is available through the Government Printing Office. Information on the subscription service and current GPO prices may be obtained by writing the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Publications Sales Manager.

**Table 1**

**DESIGN**

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed		
Accident Analysis	1.25, Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors (Safety Guide 25).	2	- Atmospheric diffusion assumptions	72.65(a), 72.74(d)	
		3.b	- External whole-body approximations assumptions	72.65(a), 72.74(d)	
	1.91, Revision 1, Evaluations of Explosions Postulated To Occur on Transportation Routes Near Nuclear Power Plants	1	- Explosive transport	72.63, 72.72(c)	
		2	- Explosive transport	72.63, 72.72(c)	
		3	- Explosive transport	72.63, 72.72(c)	
	1.145, Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants	1.2	- Distances for $\chi/Q$	72.65(a), 72.74(d)	
		1.3	- $\chi/Q$ at the controlled area	72.65(a), 72.74(d)	
		1.4	- $\chi/Q$ at EPZ	72.65(a), 72.74(d)	
		2	- Maximum sector $\chi/Q$ values	72.65(a), 72.74(d)	
		3	- 5% overall site $\chi/Q$ value	72.65(a), 72.74(d)	
		4	- Selection of $\chi/Q$	72.65(a), 72.74(d)	
		In applying this guide to an ISFSI, substitute the terms "controlled area" as defined in § 72.3(h) and "ISFSI-emergency planning zone (ISFSI-EPZ)" as defined in § 72.3(n) respectively for the terms "exclusion area" and "low population zone (LPZ)" wherever they appear.	1.78, Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release	1	- Stored chemicals
	2			- Transported chemicals	72.61(b), 72.72(j)
	3			- Onsite chemicals	72.61(b), 72.72(j)
	4			- Toxicity limits	72.72(j)
5.a	- Accident concentration			72.61(b), 72.72(j)	
6	- Dilution factor			72.61(b), 72.72(j)	
11	- Removal systems			72.72(j)	
12	- Natural phenomena and chemical release	72.61(b), 72.72(j)			
15	- Emergency procedures	72.15(a)(11)			
Control Room-- Chemical Release					

Table 1 (Continued)

DESIGN

Subject	Regulatory Guide	Regulatory Position		Portions of 10 CFR Addressed
<b>Criticality Safety</b>	3.41, Revision 1, Validation of Computational Methods for Nuclear Criticality Safety	All	- Endorsement of ANSI N16.9-1975	72.73(a)
<b>Floods</b>	1.59, Revision 2, Design Basis Floods for Nuclear Power Plants	1	- Flood conditions	72.33(c)(4), 72.61(c), 72.62, 72.72(b)(2), 72.72(b)(4)
		2.a	- Hardened protection alternative—warning time	72.33(c)(4), 72.61(c), 72.62, 72.72(b)(2), 72.72(b)(4)
		2.c	- Hardened protection alternative—less severe flood conditions	72.33(c)(4), 72.61(c), 72.62, 72.72(b)(2), 72.72(b)(4)
		3	- Unanticipated changes	72.33(c)(4), 72.61(c), 72.62, 72.72(b)(2), 72.72(b)(4)
		4	- Data utilization	72.33(c)(4), 72.61(c), 72.62, 72.72(b)(2), 72.72(b)(4)
<b>Flood Protection</b>	1.102, Revision 1, Flood Protection for Nuclear Power Plants	1	- Types of protection	72.72(b)(2)
		2	- Shutdown specifications	72.72(b)(2)
		3	- Vulnerability of safety-related equipment	72.72(b)(2)
<b>Physical Hydraulic Models</b>	1.125, Revision 1, Physical Models for Design and Operation of Hydraulic Structures and Systems for Nuclear Power Plants	1	- Model preconstruction submittals	72.15(a)(3), 72.33(c)(4), 72.61(c), 72.62
		2	- Early staff discussions	72.15(a)(3), 72.33(c)(4), 72.61(c), 72.62
		3	- Documentation	72.15(a)(3), 72.33(c)(4), 72.61(c), 72.62
		4	- Comparison of data and model	72.15(a)(3), 72.33(c)(4), 72.61(c), 72.62, 72.72(b)(3)
		5	- Design changes	72.15(a)(3), 72.33(c)(4), 72.61(c), 72.62, 72.72(b)(3)
		6	- Report contents	72.15(a)(3), 72.33(c)(4), 72.61(c), 72.62, 72.72(b)(3)

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Table 1 (Continued)

DESIGN

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed
Quality Assurance--Design and Construction	1.28, Revision 2, Quality Assurance Program Requirements (Design and Construction)	General - Endorsement of ANSI N45.2-1977	
		1 4	72.15(a)(14), 72.72(a), 72.80 72.15(a)(14), 72.72(a), 72.80
Quality Assurance--Terms	1.74, Quality Assurance Terms and Definitions	Second Paragraph - Procurement documents	72.80
Radiological Protection--ALARA	8.8, Revision 3, Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable		In applying this guide to an ISFSI, substitute the term "ISFSI" for the terms "LWR" and "nuclear power station" wherever they appear. Disregard references to the nuclear steam supply vendor.
		1.d - Review of designs and equipment	20.1(c), 72.15(a)(5), 72.74(a)
		2.a - Access control of radiation areas	20.1(c), 72.15(a)(5), 72.74(a)
		2.b(1) - Shielding for service personnel	20.1(c), 72.15(a)(5), 72.74(a)
		2.b(2) - Temporary shielding and distance	20.1(c), 72.15(a)(5), 72.74(a)
		2.b(4) - Streaming and scattering	20.1(c), 72.15(a)(5), 72.74(a)
		2.b(5) - Streaming	20.1(c), 72.15(a)(5), 72.74(a)
		2.b(6) - Reduction of exposure from pipes	20.1(c), 72.15(a)(5), 72.74(a)
		2.b(7) - Expeditious design features	20.1(c), 72.15(a)(5), 72.74(a)
		2.b(8) - Laydown space	20.1(c), 72.15(a)(5), 72.74(a)
		2.b(9) - Removal of equipment	20.1(c), 72.15(a)(5), 72.74(a)
		2.b(10) - Drains	20.1(c), 72.15(a)(5), 72.74(a)
		2.c - Process instrumentation and controls	20.1(c), 72.15(a)(5), 72.74(a)
		2.d(1) - Control of airborne contaminants (air flow)	20.1(c), 72.15(a)(5), 72.74(a), 72.74(c), 72.74(d)
2.d(2) - Ventilation systems	20.1(c), 72.15(a)(5), 72.15(a)(12), 72.74(a), 72.74(d)		

Table 1 (Continued)

Subject	Regulatory Guide	DESIGN	Regulatory Position	Portions of 10 CFR Addressed
		2.d(3)	- Auxiliary ventilation systems	20.1(c), 72.15(a)(5), 72.15(a)(12), 72.74(a), 72.74(c), 72.74(d)
		2.f	- Isolation and decontamination	20.1(c), 72.15(a)(5), 72.74(a), 72.74(b)
		2.g	- Radiation monitoring systems	20.1(c), 72.15(a)(5), 72.74(b), 72.74(c)
		2.h(1)	- Reduction of accumulation	20.1(c), 72.15(a)(5), 72.74(a)
		2.h(2)	- Need for maintenance	20.1(c), 72.15(a)(5), 72.74(a)
		2.h(3)	- Pipe bends	20.1(c), 72.15(a)(5), 72.74(a)
		2.h(4)	- Pipe surfaces	20.1(c), 72.15(a)(5), 72.74(a)
		2.h(5)	- Pipe tees	20.1(c), 72.15(a)(5), 72.74(a)
		2.h(6)	- Slurry piping	20.1(c), 72.15(a)(5), 72.74(a)
		2.h(7)	- Sparging	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(1)	- Radiation-damage-resistant materials	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(2)	- Stainless steel piping	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(3)	- Pipe routing	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(4)	- Filters	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(5)	- Servicing valves	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(7)	- Valve selection	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(8)	- Pumps	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(9)	- Sedimentation	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(10)	- Spare pipe connections	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(11)	- Station design	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(12)	- Component removal	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(13)	- Working environment	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(14)	- Lamp replacement	20.1(c), 72.15(a)(5), 72.74(a)
		2.i(15)	- Emergency lighting	20.1(c), 72.15(a)(5), 72.74(a)
		3.a	- Radiation protection program preparation and planning	20.1(c), 72.33(c)(5)
		3.b(1)	- Health physics technicians	20.1(c), 72.33(c)(5)
		3.b(3)	- Communications	20.1(c), 72.33(c)(5)
		3.c	- Postoperations	20.1(c), 72.33(c)(5)
		4	- Radiation protection facilities instrumentation and equipment	20.1(c), 72.33(c)(5), 72.74

Table 1 (Continued)

DESIGN

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed
Seismic	1.29, Revision 3, Seismic Design Classification	<ul style="list-style-type: none"> <li>1.d - All sections listed for position 1 describe applicable activities to be included</li> <li>1.g -</li> <li>1.i -</li> <li>1.j -</li> <li>1.k -</li> <li>1.l -</li> <li>1.n -</li> <li>1.p -</li> <li>1.q -</li> <li>2 - Non-safety-related components</li> <li>3 - Defined boundaries</li> </ul>	<p>In applying this guide to an ISFSI, substitute the term "ISFSI Design Earthquake (ISFSI-DE)" for the "Safe Shutdown Earthquake (SSE)" wherever it appears.</p> <p>72.72(b)(2)</p> <p>72.72(b)(2)</p> <p>72.72(b)(2)</p> <p>72.72(b)(2)</p> <p>72.72(b)(2), 72.72(i)</p> <p>72.72(b)(2)</p> <p>72.72(j)</p> <p>72.75(a)</p> <p>72.72(b)(2)</p> <p>72.72(b)(2)</p> <p>72.72(b)(2)</p>
	1.60, Revision 1, Design Response Spectra for Seismic Design of Nuclear Power Plants	<ul style="list-style-type: none"> <li>1 - Horizontal component</li> <li>2 - Vertical component</li> </ul>	<p>In applying this guide to an ISFSI, substitute the term "ISFSI Design Earthquake (ISFSI-DE)" for the term "Safe Shutdown Earthquake (SSE)" wherever it appears. The term "Operating Basis Earthquake (OBE)" is not applicable to an ISFSI.</p> <p>72.66(a)(2), 72.66(a)(6), 72.66(b)</p> <p>72.66(a)(2), 72.66(a)(6), 72.66(b)</p>
	1.61, Damping Values for Seismic Design of Nuclear Power Plants		<p>In applying this guide to an ISFSI, substitute the term "ISFSI Design Earthquake (ISFSI-DE)" for the term</p>

Table 1 (Continued)

DESIGN

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed
			<p>“Safe Shutdown Earthquake (SSE)” wherever it appears. The term “Operating Basis Earthquake (OBE)” is not applicable to an ISFSI.</p>
		1	- Modal damping values
		2	- High damping values
		3	- Combined stress
	1.92, Revision 1, Combining Modal Responses and Spatial Components in Seismic Response Analysis	1	- Combining of modal responses
		2	- Combination of effects
	1.122, Revision 1, Development of Floor Design Response Spectra for Seismic Design of Floor-Supported Equipment or Components	1	- Directional analysis
		2	- Uncertainties
		3	- Response spectrum
Site Investigations-- Foundations	1.132, Revision 1, Site Investigations for Foundations of Nuclear Power Plants		<p>This guide applies to all types of ISFSI designs (§ 72.66). If massive structures or foundations are required by the specific design (i.e., water basin, vault, canyon, support hot cell), this guide would provide applicable guidance for the site investigation.</p>
		1	- General site investigation
		2	- Boring logs
		3	- Ground-water investigations

Table 1 (Continued)

DESIGN

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed	
		4	- Procedures	72.61(a), 72.66(a)(4)
		5	- Spacing and depth	72.61(a), 72.66(a)(4)
		6	- Sampling	72.61(a), 72.66(a)(4)
		7	- Retention of records and samples	72.61(a), 72.66(a)(4)
Site Investigations-- Soils	1.138, Laboratory Investigations of Soils for Engineering Analysis and Design of Nuclear Power Plants	1	- Requirements for testing program	72.61(a), 72.66(a)(4)
		2	- Handling and storage of samples	72.61(a), 72.66(a)(4)
		3	- Selection and preparation of specimens	72.61(a), 72.66(a)(4)
		4	- Criteria for testing procedures	72.61(a), 72.66(a)(4)
		5	- Documentation	72.61(a), 72.66(a)(4)
Structures--Concrete Shields	1.69, Concrete Radiation Shields for Nuclear Power Plants	General	- Endorsement of ANSI-N101.6-1972	72.15(a)(3), 72.33(c)(4), 72.74(a)
		1		72.80
		2		72.80
		3		72.15(a)(3), 72.33(c)(4), 72.74(a)
		4		72.15(a)(3), 72.33(c)(4), 72.74(a)
		5		72.15(a)(3), 72.33(c)(4), 72.74(a)
		6		72.15(a)(3), 72.33(c)(4), 72.74(a)
		7		72.15(a)(3), 72.33(c)(4), 72.74(a)
		8		72.15(a)(3), 72.33(c)(4), 72.74(a)
Testing--Diesel Generator	1.108, Revision 1, Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants	1	- General design	72.72(f), 72.72(k)
		2	- Testing	72.72(k)
		3	- Records and reports	Reports are not submitted pursuant to Regulatory Guide 1.16. 72.72(k)

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Table 1 (Continued)

DESIGN

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed		
Testing--Protective	1.22, Periodic Testing of Protection System Actuation Functions (Safety Guide 22)	1	- Testing requirements	In applying this guide to an ISFSI, substitute the expression "ISFSI receiving and storage operations" for the expression "reactor operation" wherever it appears. 72.72(f) 72.72(f) 72.72(f)	
		2	- Testing methods		
		4	- Untested equipment		
		Tornado	1.76, Design Basis Tornado for Nuclear Power Plants		1
2	- Less conservative design basis tornado				
Waste Management Systems	1.143, Revision 1, Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants	<b>Liquid Waste System</b>		This guide does not refer to the spent fuel storage systems such as the basin, cask, vault, etc., but only applies to the systems that are used to collect, store, control, or process waste that is generated during the ISFSI operation.	
		1.1.1	- Design and test requirements		72.72(a)
		1.1.3	- Seismic criteria		72.72(b)(1), 72.72(b)(2)
		1.1.4	- Seismic criteria		72.72(b)(1), 72.72(b)(2)
		1.2	- Tank design		72.75

Table 1 (Continued)

DESIGN

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed
<b>Solid Waste System</b>			
		3.1.1 - Design and test requirements	72.72(a)
		3.1.3 - Seismic criteria	72.72(b)(1), 72.72(b)(2)
		3.1.4 - Seismic criteria	72.72(b)(1), 72.72(b)(2)
		4.1 - ALARA	72.75
		4.4 - Hydrostatic testing	72.75
		4.5 - Testing	72.75
		5.2 - Buildings housing radwaste systems	72.72(b)(1), 72.72(b)(2)
		5.3 - Optional shielding	72.72(b)(1), 72.72(b)(2)

Table 2

OPERATIONS

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed	
Atmospheric Releases	4.16, Measuring, Evaluating, and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Airborne Effluents from Nuclear Fuel Processing and Fabrication Plants	1	- Methods of sampling analysis	Examples in this guide are not applicable to an ISFSI. Environmental reports for an ISFSI should be submitted on an annual basis rather than semiannually as stated in position 5.1. 72.74(c) 72.74(c) 72.74(c) 72.74(c) 72.33(d)(3)
		2	- Sampling program	
		3	- Analysis of samples	
		4	- Precision and accuracy of results	
		5	- Reporting of results	
Atmospheric Transport	1.111, Revision 1, Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors	1	- Atmospheric transport and diffusion models	72.33(d)(3), 72.61(e), 72.65(a), 72.74(d)
		2	- Source configuration	72.33(d)(3), 72.61(e), 72.65(a), 72.74(d)
		3	- Removal mechanisms	72.33(d)(3), 72.61(e), 72.65(a), 72.74(d)
		4	- Meteorological data for models	72.33(d)(3), 72.61(e), 72.65(a), 72.74(d)
Aquatic Dispersion	1.113, Revision 1, Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I	1	- Transport and water-use models	72.15(a)(13), 72.33(d)(3), 72.61(e), 72.65(a), 72.74(d)
		2	- Selection of models	72.15(a)(13), 72.33(d)(3), 72.61(e), 72.65(a), 72.74(d)
Dose Assessment	1.109, Revision 1, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I	1	- Doses from liquid effluent pathways	72.33(d)(3), 72.61(e), 72.65(a), 72.74(d)
		3	- Doses from airborne particulates	72.33(d)(3), 72.61(e), 72.65(a), 72.74(d)
		4	- Integrated doses to population	72.33(d)(3), 72.61(e), 72.65(a), 72.74(d)

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Table 2 (Continued)

OPERATIONS

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed		
Effluent Monitoring	1.21, Revision 1, 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	2	- Location of monitoring	For an ISFSI that is co-located at a reactor site, as opposed to an ISFSI at a separate site, the monitoring requirements may be reduced. Monitoring may be needed at the fuel receiving and storage areas on a continuous basis only when spent fuel is being handled. Otherwise, periodic measurements may suffice, particularly for possible sealed storage modes. 72.74(c)(1), 72.74(d)	
		3	- Type of monitoring		72.33(d), 72.74(c)(1), 72.74(d)
		4	- Gross radioactivity measurements		72.33(d), 72.74(c)(1), 72.74(d)
		5	- Measurements of specific radionuclides		72.33(d), 72.74(c)(1), 72.74(d)
		6	- Representative samples		72.33(d), 72.74(c)(1)
		7	- Composite samples		72.33(d), 72.74(c)(1)
		8	- Time between collection and analysis		72.33(d), 72.74(c)(1)
		9	- Corrections for decay		72.33(d), 72.74(c)(1)
		11.a	- Errors in measurement		72.33(d), 72.74(d)
		11.b	- Quality controls		72.80(b)
		11.c	- Calibrations		72.74(d)
		12.b	- Significant figures		72.33(d), 72.74(d)
		12.c	- Numerical values		72.33(d), 72.74(d)
Environmental Monitoring	4.1, Revision 1, Programs for Monitoring Radioactivity in the Environs of Nuclear Power Plants	1	- Preoperational program	The preoperational monitoring period as stated in regulatory position 1 should be reduced from 2 years to 1 year. 72.33(d)(2), 72.67	
		2.a	- Sample media		72.33(d)(2), 72.67
		2.b	- Sample frequency		72.33(d)(2), 72.67

Table 2 (Continued)

OPERATIONS

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed.
		2.d	- Analysis 72.33(d)(2)
		2.e	- Quality control 72.33(d)(2), 72.80
		3	- Detection capabilities 72.33(d)(2), 72.67
Environmental Monitoring--TLD	4.13, Revision 1, Performance, Testing, and Procedural Specifications for Thermoluminescence Dosimetry: Environmental Applications	General	- Endorsement of ANSI N545-1979
		1	72.33(d)(2), 72.74(c)(2)
		2	72.33(d)(2), 72.74(c)(2)
		3	72.33(d)(2), 72.74(c)(2)
		4	72.33(d)(2), 72.74(c)(2)
		5	72.33(d)(2), 72.74(c)(2)
Quality Assurance-- Environmental Monitoring	4.15, Revision 1, Quality Assurance for Radio- logical Monitoring Programs (Normal Opera- tions)--Effluent Streams and the Environment	1	- Organization and responsibilities 72.17
		2	- Personnel qualifications 72.17
		4	- Records 72.33(c)(5), 72.80
		5	- Quality control in sampling 72.33(c)(5), 72.80
		6	- Quality control in analysis 72.33(c)(5), 72.80
		7	- Quality control for continuous monitoring systems 72.33(c)(5), 72.80
		8	- Review and analysis of data 72.33(c)(5), 72.80
		9	- Audits 72.33(c)(5), 72.80
Radiological Protection--ALARA	8.8, Revision 3, Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable	1	In applying this guide to an ISFSI, substitute the term "ISFSI" for the terms "LWR" and "nuclear power station" wherever they appear. Dis- regard references to the nuclear steam supply vendor. 20.1(c), 72.33(c)(5)
		1.a	- General--program goals 20.1(c), 72.33(c)(5)
		1.b	- Establishment of program 20.1(c), 72.33(c)(5)
			- Organization and personnel responsibilities 20.1(c), 72.17
		1.c	- Training and instruction 20.1(c), 72.17, 72.92

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## OPERATIONS

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed
	8.10, Revision 1-R, Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable	1.a	- Management commitment 20.1(c), 72.15(a)(8), 72.17, 72.33(c)(5)
		1.b	- Audits 20.1(c), 72.15(a)(8), 72.33(c)(5)
		1.c	- Responsibilities 20.1(c), 72.15(a)(8), 72.17, 72.33(b)(4), 72.33(c)(5), 72.92
		1.d	- Training 19.12, 72.17(d), 72.33(b)(4), 72.92
		1.e	- RSO authority 20.1(c), 72.15(a)(8), 72.33(c)(5)
		1.f	- Procedure modifications 20.1(c), 72.15(a)(8), 72.33(c)(5)
Radiological Protection-- Air Sampling Instruments	8.25, Calibration and Error Limits of Air Sampling Instruments for Total Volume of Air Sampled	2	- Staff vigilance 20.1(c), 72.15(a)(8), 72.33(c)(3), 72.33(c)(5)
		1	- Calibration frequency 20.103(a)(3), 72.74(b)
		2	- Error limit 20.103(a)(3), 72.74(b)
Radiological Protection-- Bioassay	8.9, Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program	3	- Documentation 20.103(a)(3), 72.74(b)
		All	- Assumption, models, concepts 20.108, 72.15(a)(12)
	8.26, Applications of Bioassay for Fission and Activation Products	All	- Endorsement of ANSI N343-1978 20.108, 72.15(a)(8)
Radiological Protection-- Evacuation Signal	8.5, Revision 1, Criticality and Other Interior Evacuation Signals	All	- Endorsement of ANSI/ANS N2.3-1979 72.74(b)
Radiological Protection-- Pocket Dosimeters	8.4, Direct-Reading and Indirect-Reading Pocket Dosimeters	1	- Testing 20.202(a), 20.401, 72.15(a)(5)
		2	- Rejection 20.202(a), 20.401, 72.15(a)(5)
		3	- Mixed radiation fields 20.202(a), 20.401, 72.15(a)(5)

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OPERATIONS

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed
Radiological Protection-- Prenatal Exposure	8.13, Revision 1, Instruction Concerning Prenatal Radiation Exposure	1	- Instruction 19.12
		2	- Reasons 19.12
Radiological Protection-- Respiratory Protection	8.15, Acceptable Programs for Respiratory Protection	1	- Written policy 20.103
		2	- Equipment selection 20.103
		3	- Individual use of respirator 20.103
		4	- Requirements of program 20.103
		5	- Equipment approval 20.103
		6	- Unapproved equipment 20.103
		7	- Protection factors 20.103
		8	- Technical requirements 20.103
Radiological Protection-- Symbol	8.1, Radiation Symbol	General	20.203
Safeguards--Alarm Systems	5.44, Revision 2, Perimeter Intrusion Alarm Systems	1	- Qualification 72.81
		2	- Testing 72.81
Safeguards--Contingency Plans	5.55, Standard Format and Content of Safe- guards Contingency Plans for Fuel Cycle Facilities	All	- Contingency plans 72.83
Safeguards--Entry/Exit Control	5.7, Revision 1, Entry/Exit Control for Protected Areas, Vital Areas, and Material Access Areas	1	- Protected Areas 72.81
		2	- Material Access Areas 72.81
		3	- Vital Areas 72.81
		4	- Emergency procedures 72.71(q), 72.81
Safeguards--Locks	5.12, General Use of Locks in the Protection and Control of Facilities and Special Nuclear Materials	1	- Combination locks 72.81
		2	- Combination padlocks 72.81
		3	- Key locks 72.81
		4	- Key padlocks 72.81

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Table 2 (Continued)

OPERATIONS

Subject	Regulatory Guide	Regulatory Position	Portions of 10 CFR Addressed	
		5	- Electric locks 72.81	
		6	- Pushbutton mechanical locks 72.81	
		7	- Mechanical locks 72.81	
		8	- Combinations 72.81	
Safeguards--Security Force	5.20, Training, Equipping, and Qualifying of Guards and Watchmen	1	- Preemployment screening 72.81	
		2	- Training 72.81	
		3	- Testing and requalification 72.81	
		4	- Equipment 72.81	
	5.43, Plant Security Force Duties	1	- Organization 72.81	
		2	- Duties 72.81	
	Safeguards--Transportation	5.57, Revision 1, Shipping and Receiving Control of Strategic Special Nuclear Material	1	- Preshipment controls on waste 72.81
			2	- Overchecks 72.81
3			- Additional shipping controls 72.54, 72.81	
4			- Receipts 72.54, 72.81	
Safeguards--Visual Surveillance	5.14, Revision 1, Use of Observation (Visual Surveillance) Techniques in Material Access Areas	1	- Operational measures 72.81	
		2	- Aids to effective surveillance 72.81	

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Table 3

GUIDES SPECIFIC TO AN ISFSI\*

Subject	Regulatory Guide	Regulatory Position	
Design--Water Basin	3.49, Design of an Independent Spent Fuel Storage Installation (Water-Basin Type)	All	Endorsement of ANSI/ANS 57.7-1981
License Application	3.50, Guidance on Preparing a License Application To Store Spent Fuel in an Independent Spent Fuel Storage Installation	All	
Safety Analysis Report-- Water Basin	3.44, Revision 1, Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation (Water-Basin Type)	All	
Safety Analysis Report-- Dry Storage	3.48, Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation (Dry Storage)	All	

\* The regulatory basis for all guides in Table 3 is 10 CFR Part 72.

## VALUE/IMPACT STATEMENT

### 1. PROPOSED ACTION

#### 1.1 Description

The storage of spent fuel in an independent spent fuel storage installation (ISFSI) is licensed under 10 CFR Part 72. For this type of installation, much of the material in existing regulatory guides is applicable. The proposed action would be the issuance of a regulatory guide that would identify the guides that are applicable to ISFSIs and the extent of their applicability.

#### 1.2 Need

Applications covering spent fuel storage in an ISFSI are expected to be received in increasing quantity during the next few years. The regulatory base applicable to ISFSIs is not comparable to that for nuclear reactors, therefore, the issuance of this guide is a major step toward meeting this deficiency.

#### 1.3 Value/Impact Assessment

##### 1.3.1 NRC

The guidance provided by this guide is likely to expedite the NRC staff's evaluation of the applications.

##### 1.3.2 Other Government Agencies

None.

##### 1.3.3 Industry

This guide will be of particular value to industry since there are no precedents specifically applicable to a license application under 10 CFR Part 72.

##### 1.3.4 Workers

The principle of maintaining occupational exposures as low as is reasonably achievable (ALARA) is covered in the proposed document.

##### 1.3.5 Public

This guide is designed primarily for the protection of the public and the environment.

### 1.4 Decision on Proposed Action

This guide is considered the most expeditious way to convey to the public, the industry, and the staff the applicability of existing guidance to licensing actions pursuant to Part 72.

### 2. TECHNICAL APPROACH

This guide addresses all technical subjects applicable to ISFSIs on which there is existing guidance.

### 3. PROCEDURAL APPROACH

Among the procedural alternatives considered for making this guidance available, a regulatory guide was determined to be the most appropriate.

### 4. STATUTORY CONSIDERATIONS

#### 4.1 NRC Authority

The NRC derives its statutory authority from the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended, to provide guidance on acceptable means of meeting the requirements of its regulations.

#### 4.2 Need for NEPA Assessment

The issuance of this guide is not a major action as defined in paragraph 51.5(a) of 10 CFR Part 51, hence, the action does not require an environmental impact statement.

### 5. RELATIONSHIP TO OTHER EXISTING OR PROPOSED REGULATIONS OR POLICIES

This guide is one of a series of guides on the storage of spent fuel in an ISFSI.

### 6. SUMMARY AND CONCLUSIONS

This guide is the most expeditious way of establishing part of the regulatory base required for the licensing of the storage of spent fuel in an ISFSI.

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NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555

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