



**FuelSolutions™ Storage System
Final Safety Analysis Report**

Revision 5

April 2015

Document No. WSNF-220

Docket No. 72-1026

Prepared by:

EnergySolutions Spent Fuel Division, Inc.

Campbell, California

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ACRONYMS AND ABBREVIATIONS

ACI	American Concrete Institute
ACTL	Activation Library
AISC	American Institute of Steel Construction
ALARA	As Low As Reasonably Achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASME Code	ASME B&PV Code
ASTM	American Society of Testing and Materials
AWS	American Welding Society
AW/OS	Automated Welding/Opening System
B&PV Code or BPVC	Boiler and Pressure Vessel Code
BRL	Ballistic Research Laboratory
BRP	Big Rock Point
BU	Burnup
BWR	Boiling Water Reactor
C of C	Certificate of Compliance
CE	Combustion Engineering
CFR	Code of Federal Regulation
CG	Center of Gravity
CGA	Compressed Gas Association
CISF	Centralized Interim Storage Facility
CMAA	Crane Manufacturers Association of America
CMTR	Certified Material Test Report
CNFD	Westinghouse Commercial Nuclear Fuel Division
CRUD	Chalk River Unidentified Deposits (debris/residues)
CRWMS	Civilian Radioactive Waste Management System
CS	Carbon Steel
DAR	Design Analysis Report
DBE	Design Basis Earthquake

ACRONYMS AND ABBREVIATIONS (continued)

DBT	Design Basis Tornado
DBW	Design Basis Wind
DCCG	Diffusion Controlled Cavity Growth
DFD	Design for Disassembly
DLF	Dynamic Load Factor
DM	Design Margins
DOE	U.S. Department of Energy
DU	Depleted Uranium
ENDF	Evaluated Nuclear Data File
ENDL	Evaluated Nuclear Data Library
EPRI	Electric Power Research Institute
ESBU	Westinghouse Energy Systems Business Unit
FSAR	Final Safety Analysis Report
FuelSolutions™ System	EnergySolutions Spent Fuel Management System (formerly referred to as the Wesflex™ System)
GE	General Electric
GTCC	Greater than Class C
GTSD	Westinghouse Government Technical Services Division
HAC	Hypothetical Accident Condition
HCN	United States Historical Climatology Network
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilating, and Air Conditioning
IPEEE	Individual Plant Examination of External Events
ISFSI	Independent Spent Fuel Storage Installation
ISI	Inservice Inspection
ITS	Important to Safety
LLNL	Lawrence Livermore National Laboratory
LOCA	Loss-of-Coolant Accident
LSA	Low Specific Activity
LTP	Long-Term Performance
LWR	Light Water Reactor

ACRONYMS AND ABBREVIATIONS (continued)

MGDS	Mined Geological Disposal Site
MOX	Mixed Oxide
MPC	Multi-Purpose Canister
MRC	Material Review Committee
MRS	Monitored Retrievable Storage
MT	Magnetic Particle Examination
M&TE	Measuring and Testing Equipment/Instrumentation
NA or N/A	Not Applicable
NCT	Normal Conditions of Transport
NDE or NDT	Non-Destructive Examination or Testing
NDRC	National Defense Research Council
NFC	Non-fuel Components
NFPA	National Fire Protection Association
NIAC	Nuclear Industry Assessment Committee
NITS	Not Important to Safety
NLTP	Non-Long-Term Performance
NOAA	National Oceanographic and Atmospheric Agency
NP	Non-Proprietary
NPP	Nuclear Power Plant
NPT	National Pipe Thread
NRC	U.S. Nuclear Regulatory Commission
OCRWM	Office of Civilian Radioactive Waste Management
PC	Personal Computer
PT	Liquid Penetrant Examination
PWR	Pressurized Water Reactor
QA	Quality Assurance
QMS	Quality Management System
RC	Reinforced Concrete
RG	Regulatory Guide
RT	Radiographic Examination
SAE	Society of Automotive Engineers

ACRONYMS AND ABBREVIATIONS (continued)

SAR	Safety Analysis Report
SER	Safety Evaluation Report
SFMS	Spent Fuel Management System
SNF	Spent Nuclear Fuel
SRP	Standard Review Plan
SRSS	Square Root Sum of the Squares
SS	Stainless Steel
SSC	Structures, Systems, and Components
TEDE	Total Effective Dose Equivalent
TSC	Transportable Storage Canister
U.S.	United States
UT	Ultrasonic Examination
VDS	Vacuum Drying System
VT	Visual Inspection
WELCO	Westinghouse Electric Company
Wesflex™ System	Former name of the FuelSolutions™ System (any reference to Wesflex™ shall be taken to mean FuelSolutions™)
ZPA	Zero Period Acceleration

13. QUALITY ASSURANCE

This chapter establishes the Quality Assurance (QA) program being applied to the design, analysis, fabrication, assembly, and testing of FuelSolutions™ Storage System components that are important to safety and the support equipment that is either important to safety or safety-related, as defined in Section 2.1.1 of this FSAR.

All quality-related activities will be controlled under an NRC-approved quality assurance program, meeting the requirements of 10CFR50,¹ Appendix B; 10CFR71,² Subpart H; and 10CFR72,³ Subpart G. For activities that are performed by EnergySolutions Spent Fuel Division, Inc. (EnergySolutions SFD), this program is contained in the approved EnergySolutions Quality Assurance Program (QAP).⁴ The licensee's QA program will be used to control activities performed by the licensee.

EnergySolutions SFD is responsible for the FuelSolutions™ SFMS, as discussed in Section 1.3 of this FSAR. EnergySolutions SFD implements its Quality Assurance Program for nuclear quality-related activities. The EnergySolutions SFD Quality Assurance Procedures are used to implement the provisions of the EnergySolutions Quality Assurance Manual for the nuclear quality-related activities associated with the FuelSolutions™ SFMS.

The EnergySolutions Quality Assurance Program will be applied to the important to safety (10CFR72) components, to the important to safety (10CFR72) and support equipment of the FuelSolutions™ SFMS, and to the associated nuclear quality-related activities. In addition to compliance with 10CFR72, Subpart G, the EnergySolutions SFD Quality Assurance Procedures are based on the requirements of Regulatory Guide 7.10.⁵ Guidance is also taken from NUREG/CR-6407.⁶ These quality procedures are used to establish the quality category of components, subassemblies, and piece parts according to each item's importance to nuclear safety.

The matrix in Table 13-1 shows the 10CFR72, Subpart G, criteria and the respective sections of the EnergySolutions Quality Assurance Manual that address the criteria.

¹ Title 10, U.S. Code of Federal Regulations, Part 50 (10CFR50), *Domestic Licensing of Production and Utilization Facilities*, 1995.

² Title 10, U.S. Code of Federal Regulations Part 71 (10CFR71), *Packaging Requirements for Transportation of Radioactive Materials*, 1996.

³ Title 10, U.S. Code of Federal Regulations, Part 72 (10CFR72), *Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste*, 1995.

⁴ EnergySolutions. Quality Assurance Program, NRC Docket No 71-0935.

⁵ Regulatory Guide 7.10, *Establishing Quality Assurance Programs for Packaging Used in the Transport of Radioactive Material*, U.S. Nuclear Regulatory Commission, June 1974.

⁶ NUREG/CR-6407, *Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety*, U.S. Nuclear Regulatory Commission, February 1996.

Table 13-1 - Quality Assurance Criteria Matrix

10CFR72, Subpart G		EnergySolutions Quality Assurance Manual Section
Section	Criteria	
72.142	Organization	1
72.144	Quality Assurance Program	2
72.146	Design Control	3
72.148	Procurement Document Control	4
72.150	Instructions, Procedures, and Drawings	5
72.152	Document Control	6
72.154	Control of Purchased Material, Equipment, and Services	7
72.156	Identification and Control of Material, Parts, and Components	8
72.158	Control of Special Processes	9
72.160	Licensee Inspection	10
72.162	Test Control	11
72.164	Control of Measuring and Test Equipment	12
72.166	Handling, Storage, and Shipping Control	13
72.168	Inspection, Test, and Operating Status	14
72.170	Nonconforming Materials, Parts, or Components	15
72.172	Corrective Action	16
72.174	Quality Assurance Records	17
72.176	Audits	18