





# Appendices

## Abbreviations

<b>ABWR</b>	advanced boiling-water reactor	<b>EPZ</b>	emergency planning zone
<b>AC</b>	Allis Chalmers	<b>ERO</b>	emergency response organization
<b>ACRS</b>	Advisory Committee on Reactor Safeguards	<b>ESBWR</b>	Economic Simplified Boiling-Water Reactor
<b>ADAMS</b>	Agencywide Documents Access and Management System	<b>ESP</b>	early site permit
<b>ADR</b>	Alternative Dispute Resolution	<b>EVESR</b>	ESADA (Empire States Atomic Development Associates)
<b>AEC</b>	Atomic Energy Commission (U.S.)		Valleccitos Experimental Superheat Reactor
<b>AEP</b>	American Electric Power Company	<b>Exp. DATE</b>	expiration date of operating license
<b>AGN</b>	solid homogeneous core (Aerojet-General Nucleonics)	<b>FB</b>	Federal Bureau of Investigation (U.S.)
<b>ASLB</b>	Atomic Safety and Licensing Board	<b>FBR</b>	fast breeder reactor
<b>B&amp;R</b>	Burns & Roe	<b>FEMA</b>	Federal Emergency Management Agency
<b>B&amp;W</b>	Babcock & Wilcox	<b>FERC</b>	Federal Energy Regulatory Commission
<b>BALD</b>	Baldwin Associates	<b>FLUR</b>	Fluor Pioneer
<b>BECH</b>	Bechtel	<b>FOIA</b>	Freedom of Information Act
<b>BRRT</b>	Brown & Root	<b>FTE</b>	full-time equivalent
<b>BWR</b>	boiling-water reactor	<b>FW</b>	Foster Wheeler
<b>CE</b>	Combustion Engineering	<b>FY</b>	fiscal year
<b>CEUS</b>	Central and Eastern United States Seismic Source	<b>G&amp;H</b>	Gibbs & Hill
<b>CFR</b>	<i>Code of Federal Regulations</i>	<b>GA</b>	General Atomic
<b>CO</b>	Commission order	<b>GCR</b>	gas-cooled reactor
<b>Co</b>	company	<b>GE</b>	General Electric
<b>COGGE</b>	Committee on Geological and geotechnical Engineering	<b>GEH</b>	General Electric-Hitachi Nuclear Energy
<b>COL</b>	combined license	<b>GEIS</b>	generic environmental impact statement
<b>COMM. OP.</b>	date of commercial operation	<b>GETR</b>	General Electric Test Reactor
<b>CON TYPE</b>	containment type	<b>GHDR</b>	Gibbs & Hill & Durham & Richardson
<b>DRYAMB</b>	dry, ambient pressure	<b>GIL</b>	Gilbert Associates
<b>DRYSUB</b>	dry, subatmospheric	<b>GL</b>	general license
<b>ICECND</b>	wet, ice condenser	<b>GPC</b>	Georgia Power Company
<b>MARK 1</b>	wet, Mark I	<b>GWe</b>	gigawatt(s) electrical
<b>MARK 2</b>	wet, Mark II	<b>GWh</b>	gigawatts hours
<b>MARK 3</b>	wet, Mark III	<b>HTG</b>	high-temperature gas (reactor)
<b>CP</b>	civil penalty	<b>HWR</b>	heavy-water reactor
<b>CP ISSUED</b>	date of construction permit issuance	<b>IAEA</b>	International Atomic Energy Agency
<b>CRGR</b>	Committee To Review Generic Requirements	<b>INES</b>	International Nuclear Event Scale
<b>CVP</b>	civil penalties	<b>ISFSI</b>	independent spent fuel storage installation
<b>CVTR</b>	Carolas-Virginia Tube Reactor	<b>ISR</b>	in situ recovery
<b>CWE</b>	Commonwealth Edison Company	<b>KAIS</b>	Kaiser Engineers
<b>CY</b>	calendar year	<b>KI</b>	potassium iodide
<b>DANI</b>	Daniel International	<b>kW</b>	kilowatt(s)
<b>DBDB</b>	Duke & Bechtel	<b>LES</b>	Louisiana Energy Services
<b>DBT</b>	design-basis threat	<b>LLP</b>	B&W lowered loop
<b>DC</b>	design certification	<b>LLW</b>	low-level radioactive waste
<b>DHS</b>	Department of Homeland Security (U.S.)	<b>LMFB</b>	liquid metal fast breeder (reactor)
<b>DOE</b>	Department of Energy (U.S.)	<b>LR ISSUED</b>	license renewal issued
<b>DOT</b>	Department of Transportation (U.S.)	<b>LWGR</b>	light-water-cooled graphite moderated reactor
<b>DUKE</b>	Duke Power Company	<b>MOX</b>	mixed-oxide
<b>EBSO</b>	Ebasco	<b>MW</b>	megawatt(s)
<b>EIA</b>	Energy Information Administration (DOE)	<b>MWe</b>	megawatt(s) electrical
<b>EIS</b>	environmental impact statement	<b>MWh</b>	megawatt-hour(s)
<b>EPA</b>	Environmental Protection Agency (U.S.)		
<b>EPR</b>	Evolutionary Power Reactor		

<b>MWt</b>	megawatt(s) thermal	<b>RLP</b>	B&W raised loop
<b>NIAG</b>	Niagara Mohawk Power Corporation	<b>ROP</b>	Reactor Oversight Process
<b>NEA</b>	Nuclear Energy Agency	<b>RTR</b>	research and test reactors
<b>NMMSS</b>	Nuclear Material Management and Safeguards System	<b>S&amp;L</b>	Sargent & Lundy
<b>NOV</b>	notice(s) of violation	<b>S&amp;W</b>	Stone & Webster
<b>NOVF</b>	notice(s) of violation associated with inspection findings	<b>SAMG</b>	Severe Accident Management Guidance
<b>NOVSL</b>	notice(s) of violation for severity level	<b>SCF</b>	sodium-cooled fast (reactor)
<b>NRC</b>	Nuclear Regulatory Commission (U.S.)	<b>SDP</b>	significance determination process
<b>NSP</b>	Northern States Power Company	<b>SGEC</b>	architect for Vogtle
<b>NSSS</b>	nuclear steam system supplier and design type	<b>SI</b>	système internationale (d'unités) (International System of Units)
<b>GE 2</b>	GE Type 2	<b>SL</b>	severity level
<b>GE 3</b>	GE Type 3	<b>SOARCA</b>	State-of-the-Art Consequence Analysis
<b>GE 4</b>	GE Type 4	<b>SSI</b>	Southern Services Incorporated
<b>GE 5</b>	GE Type 5	<b>STARS</b>	Strategic Teaming and Resource Sharing Group
<b>GE 6</b>	GE Type 6	<b>STP</b>	South Texas Project
<b>WEST 2LP</b>	Westinghouse Two-Loop	<b>TMI-2</b>	Three Mile Island Unit 2
<b>WEST 3LP</b>	Westinghouse Three-Loop	<b>Sv</b>	sievert
<b>WEST 4LP</b>	Westinghouse Four-Loop	<b>TRACE</b>	reactor systems codes
<b>NSTS</b>	National Source Tracking System	<b>TRIGA</b>	Training Reactor and Isotopes Production, General Atomics
<b>OECD</b>	Organisation for Economic Co-operation and Development	<b>TVA</b>	Tennessee Valley Authority
<b>OL</b>	operating license	<b>UE&amp;C</b>	United Engineers & Constructors
<b>OL ISSUED</b>	date of latest full power operating license	<b>USEC</b>	U.S. Enrichment Corporation
<b>PG&amp;E</b>	Pacific Gas & Electric Company	<b>US-APWR</b>	United States [version of] Advanced Pressurized-Water Reactor
<b>PRA</b>	probabilistic risk assessment	<b>VBWR</b>	Vallecitos Boiling-Water Reactor
<b>PRIS</b>	Power Reactor Information System	<b>WDCO</b>	Westinghouse Development Corporation
<b>PSEG</b>	Public Service Electric and Gas Company	<b>WEST</b>	Westinghouse Electric
<b>PWR</b>	pressurized-water reactor	<b>WNA</b>	World Nuclear Association
<b>RIC</b>	Regulatory Information Conference		

Alabama	AL	Kentucky	KY	Ohio	OH
Alaska	AK	Louisiana	LA	Oklahoma	OK
Arizona	AZ	Maine	ME	Oregon	OR
Arkansas	AR	Maryland	MD	Pennsylvania	PA
California	CA	Massachusetts	MA	Puerto Rico	PR
Colorado	CO	Michigan	MI	Rhode Island	RI
Connecticut	CT	Minnesota	MN	South Carolina	SC
Delaware	DE	Mississippi	MS	South Dakota	SD
District of Columbia	DC	Missouri	MO	Tennessee	TN
Florida	FL	Montana	MT	Texas	TX
Georgia	GA	Nebraska	NE	Utah	UT
Guam	GU	Nevada	NV	Vermont	VT
Hawaii	HI	New Hampshire	NH	Virgin Islands	VI
Idaho	ID	New Jersey	NJ	Virginia	VA
Illinois	IL	New Mexico	NM	Washington	WA
Indiana	IN	New York	NY	West Virginia	WV
Iowa	IA	North Carolina	NC	Wisconsin	WI
Kansas	KS	North Dakota	ND	Wyoming	WY

## APPENDIX A

### U.S. Commercial Nuclear Power Reactors Operating Reactors

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Arkansas Nuclear One, Unit 1 Entergy Operations, Inc. London, AR (6 miles NW of Russellville, AR) 05000313 <a href="http://www.nrc.gov/info-finder/reactor/ano1.html">www.nrc.gov/info-finder/reactor/ano1.html</a>	IV	PWR-DRYAMB	2,568	12/06/1968	99
		B&W LLP		05/21/1974	90
		BECH		12/19/1974	87
		BECH		06/20/2001	102
				05/20/2034	56
				98	
Arkansas Nuclear One, Unit 2 Entergy Operations, Inc. London, AR (6 miles NW of Russellville, AR) 05000368 <a href="http://www.nrc.gov/info-finder/reactor/ano2.html">www.nrc.gov/info-finder/reactor/ano2.html</a>	IV	PWR-DRYAMB	3,026	12/06/1972	90
		CE		09/01/1978	97
		BECH		03/26/1980	90
		BECH		06/30/2005	93
				07/17/2038	91
			85		
Beaver Valley Power Station, Unit 1 FirstEnergy Nuclear Operating Co. Shippingport, PA (17 miles W of McCandless, PA) 05000334 <a href="http://www.nrc.gov/info-finder/reactor/bv1.html">www.nrc.gov/info-finder/reactor/bv1.html</a>	I	PWR-DRYAMB	2,900	06/26/1970	92
		WEST 3LP		07/02/1976	91
		S&W		10/01/1976	101
		S&W		11/05/2009	92
				01/29/2036	86
			86		
Beaver Valley Power Station, Unit 2 FirstEnergy Nuclear Operating Co. Shippingport, PA (17 miles W of McCandless, PA) 05000412 <a href="http://www.nrc.gov/info-finder/reactor/bv2.html">www.nrc.gov/info-finder/reactor/bv2.html</a>	I	PWR-DRYAMB	2,900	05/03/1974	87
		WEST 3LP		08/14/1987	84
		S&W		11/17/1987	102
		S&W		11/05/2009	91
				05/27/2047	97
			98		
Braidwood Station, Unit 1 Exelon Generation Co., LLC Braceville, IL (20 miles SW of Joliet, IL) 05000456 <a href="http://www.nrc.gov/info-finder/reactor/brai1.html">www.nrc.gov/info-finder/reactor/brai1.html</a>	III	PWR-DRYAMB	3,645	12/31/1975	95
		WEST 4LP		07/02/1987	89
		S&L		07/29/1988	101
		CWE		N/A	91
				10/17/2026	95
			103		
Braidwood Station, Unit 2 Exelon Generation Co., LLC Braceville, IL (20 miles SW of Joliet, IL) 05000457 <a href="http://www.nrc.gov/info-finder/reactor/brai2.html">www.nrc.gov/info-finder/reactor/brai2.html</a>	III	PWR-DRYAMB	3,645	12/31/1975	93
		WEST 4LP		05/20/1988	99
		S&L		10/17/1988	93
		CWE		N/A	93
				12/18/2027	98
			96		
Browns Ferry Nuclear Plant, Unit 1 Tennessee Valley Authority Athens (Limestone County), AL (32 miles W of Huntsville, AL) 05000259 <a href="http://www.nrc.gov/info-finder/reactor/bf1.html">www.nrc.gov/info-finder/reactor/bf1.html</a>	II	BWR-MARK 1	3,458	05/10/1967	94
		GE 4		12/20/1973	86
		TVA		08/01/1974	91
		TVA		05/04/2006	88
				12/20/2033	94
			90		

## APPENDIX A

### U.S. Commercial Nuclear Power Reactors (continued) Operating Reactors

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Browns Ferry Nuclear Plant, Unit 2 Tennessee Valley Authority Athens (Limestone County), AL (32 miles W of Huntsville, AL) 05000260 <a href="http://www.nrc.gov/info-finder/reactor/bf2.html">www.nrc.gov/info-finder/reactor/bf2.html</a>	II	BWR-MARK 1	3,458	05/10/1967	94
		GE 4		06/28/1974	91
		TVA		03/01/1975	80
		TVA		05/04/2006	99
				06/28/2034	79
					98
Browns Ferry Nuclear Plant, Unit 3 Tennessee Valley Authority Athens (Limestone County), AL (32 miles W of Huntsville, AL) 05000296 <a href="http://www.nrc.gov/info-finder/reactor/bf3.html">www.nrc.gov/info-finder/reactor/bf3.html</a>	II	BWR-MARK 1	3,458	07/31/1968	95
		GE 4		07/02/1976	81
		TVA		03/01/1977	87
		TVA		05/04/2006	83
				07/02/2036	89
				88	
Brunswick Steam Electric Plant, Unit 1 Duke Energy Progress, Inc. Southport, NC (30 miles S of Wilmington, NC) 05000325 <a href="http://www.nrc.gov/info-finder/reactor/bru1.html">www.nrc.gov/info-finder/reactor/bru1.html</a>	II	BWR-MARK 1	2,923	02/07/1970	98
		GE 4		09/08/1976	83
		UE&C		03/18/1977	100
		BRRT		06/26/2006	77
				09/08/2036	92
				89	
Brunswick Steam Electric Plant, Unit 2 Duke Energy Progress, Inc. Southport, NC (30 miles S of Wilmington, NC) 05000324 <a href="http://www.nrc.gov/info-finder/reactor/bru2.html">www.nrc.gov/info-finder/reactor/bru2.html</a>	II	BWR-MARK 1	2,923	02/07/1970	80
		GE 4		12/27/1974	99
		UE&C		11/03/1975	79
		BRRT		06/26/2006	98
				12/27/2034	73
				98	
Byron Station, Unit 1 Exelon Generation Co., LLC Byron, IL (17 miles SW of Rockford, IL) 05000454 <a href="http://www.nrc.gov/info-finder/reactor/byro1.html">www.nrc.gov/info-finder/reactor/byro1.html</a>	III	PWR-DRYAMB	3,645	12/31/1975	94
		WEST 4LP		02/14/1985	101
		S&L		09/16/1985	88
		CWE		N/A	88
				10/31/2024	96
				97	
Byron Station, Unit 2 Exelon Generation Co., LLC Byron, IL (17 miles SW of Rockford, IL) 05000455 <a href="http://www.nrc.gov/info-finder/reactor/byro2.html">www.nrc.gov/info-finder/reactor/byro2.html</a>	III	PWR-DRYAMB	3,645	12/31/1975	102
		WEST 4LP		01/30/1987	96
		S&L		08/02/1987	93
		CWE		N/A	94
				11/06/2026	86
				94	
Callaway Plant Union Electric Co. Fulton, MO (25 miles NE of Jefferson City, MO) 05000483 <a href="http://www.nrc.gov/info-finder/reactor/call.html">www.nrc.gov/info-finder/reactor/call.html</a>	IV	PWR-DRYAMB	3,565	04/16/1976	98
		WEST 4LP		10/18/1984	86
		BECH		12/19/1984	90
		DANI		03/06/2015	103
				10/18/2044	77
				89	

**APPENDIX A**  
**U.S. Commercial Nuclear Power Reactors (continued)**  
**Operating Reactors**

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Calvert Cliffs Nuclear Power Plant, Unit 1 Calvert Cliffs Nuclear Power Plant, LLC Exelon Generation Co., LLC Lusby, MD (40 miles S of Annapolis, MD) 05000317 <a href="http://www.nrc.gov/info-finder/reactor/calv1.html">www.nrc.gov/info-finder/reactor/calv1.html</a>	I	PWR-DRYAMB	2,737	07/07/1969	98
		CE		07/31/1974	90
		BECH		05/08/1975	101
		BECH		03/23/2000	81
				07/31/2034	97
					91
Calvert Cliffs Nuclear Power Plant, Unit 2 Calvert Cliffs Nuclear Power Plant, LLC Exelon Generation Co., LLC Lusby, MD (40 miles S of Annapolis, MD) 05000318 <a href="http://www.nrc.gov/info-finder/reactor/calv2.html">www.nrc.gov/info-finder/reactor/calv2.html</a>	I	PWR-DRYAMB	2,737	07/07/1969	93
		CE		08/13/1976	97
		BECH		04/01/1977	92
		BECH		03/23/2000	101
				08/13/2036	81
					100
Catawba Nuclear Station, Unit 1 Duke Energy Carolinas, LLC York, SC (18 miles S of Charlotte, NC) 05000413 <a href="http://www.nrc.gov/info-finder/reactor/cat1.html">www.nrc.gov/info-finder/reactor/cat1.html</a>	II	PWR-ICECND	3,411	08/07/1975	91
		WEST 4LP		01/17/1985	100
		DUKE		06/29/1985	89
		DUKE		12/05/2003	89
				12/05/2043	96
					86
Catawba Nuclear Station, Unit 2 Duke Energy Carolinas, LLC York, SC (18 miles S of Charlotte, NC) 05000414 <a href="http://www.nrc.gov/info-finder/reactor/cat2.html">www.nrc.gov/info-finder/reactor/cat2.html</a>	II	PWR-ICECND	3,411	08/07/1975	90
		WEST 4LP		05/15/1986	92
		DUKE		08/19/1986	101
		DUKE		12/05/2003	92
				12/05/2043	86
					100
Clinton Power Station, Unit 1 Exelon Generation Co., LLC Clinton, IL (23 miles SSE of Bloomington, IL) 05000461 <a href="http://www.nrc.gov/info-finder/reactor/clin.html">www.nrc.gov/info-finder/reactor/clin.html</a>	III	BWR-MARK 3	3,473	02/24/1976	97
		GE 6		04/17/1987	92
		S&L		11/24/1987	93
		BALD		N/A	100
				09/29/2026	82
					97
Columbia Generating Station Energy Northwest Benton County, WA (12 miles NW of Richland, WA) 05000397 <a href="http://www.nrc.gov/info-finder/reactor/wash2.html">www.nrc.gov/info-finder/reactor/wash2.html</a>	IV	BWR-MARK 2	3,486	03/19/1973	67
		GE 5		04/13/1984	95
		B&R		12/13/1984	50
		BECH		05/22/2012	97
				12/20/2043	80
					98
Comanche Peak Nuclear Power Plant, Unit 1 Luminant Generation Co., LLC Glen Rose, TX (40 miles SW of Fort Worth, TX) 05000445 <a href="http://www.nrc.gov/info-finder/reactor/cp1.html">www.nrc.gov/info-finder/reactor/cp1.html</a>	IV	PWR-DRYAMB	3,612	12/19/1974	100
		WEST 4LP		04/17/1990	91
		G&H		08/13/1990	91
		BRRT		N/A	98
				02/08/2030	94
					85

## APPENDIX A

### U.S. Commercial Nuclear Power Reactors (continued) Operating Reactors

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Comanche Peak Nuclear Power Plant, Unit 2 Luminant Generation Company, LLC Glen Rose, TX (40 miles SW of Fort Worth, TX) 05000446 www.nrc.gov/info-finder/reactor/cp2.html	IV	PWR-DRYAMB	3,612	12/19/1974	94
		WEST 4LP		04/06/1993	104
		BECH		08/03/1993	92
		BRRT		N/A	91
				02/02/2033	99
Cooper Nuclear Station Nebraska Public Power District Brownville, NE (23 miles S of Nebraska City, NE) 05000298 www.nrc.gov/info-finder/reactor/cns.html	IV	BWR-MARK 1	2,419	06/04/1968	72
		GE 4		01/18/1974	100
		B&R		07/01/1974	86
		B&R		11/29/2010	87
				01/18/2034	97
Davis-Besse Nuclear Power Station, Unit 1 FirstEnergy Nuclear Operating Co. Oak Harbor, OH (21 miles ESE of Toledo, OH) 05000346 www.nrc.gov/info-finder/reactor/davi.html	III	PWR-DRYAMB	2,817	03/24/1971	99
		B&W RLP		04/22/1977	66
		BECH		07/31/1978	81
		B&W		N/A	91
				04/22/2017	95
Diablo Canyon Nuclear Power Plant, Unit 1 Pacific Gas & Electric Co. Avila Beach, CA (12 miles SW of San Luis Obispo, CA) 05000275 www.nrc.gov/info-finder/reactor/diab1.html	IV	PWR-DRYAMB	3,411	4/23/1968	84
		WEST 4LP		11/02/1984	88
		PG&E		05/07/1985	100
		PG&E		N/A	84
				11/02/2024	95
Diablo Canyon Nuclear Power Plant, Unit 2 Pacific Gas & Electric Co. Avila Beach, CA (12 miles SW of San Luis Obispo, CA) 05000323 www.nrc.gov/info-finder/reactor/diab2.html	IV	PWR-DRYAMB	3,411	12/09/1970	84
		WEST 4LP		08/26/1985	100
		PG&E		03/13/1986	89
		PG&E		N/A	97
				08/26/2025	82
Donald C. Cook Nuclear Plant, Unit 1 Indiana Michigan Power Co. Bridgman, MI (13 miles S of Benton Harbor, MI) 05000315 www.nrc.gov/info-finder/reactor/cook1.html	III	PWR-ICECND	3,304	03/25/1969	3
		WEST 4LP		10/25/1974	88
		AEP		08/28/1975	87
		AEP		08/30/2005	104
				10/25/2034	78
Donald C. Cook Nuclear Plant, Unit 2 Indiana Michigan Power Co. Bridgman, MI (13 miles S of Benton Harbor, MI) 05000316 www.nrc.gov/info-finder/reactor/cook2.html	III	PWR-ICECND	3,468	03/25/1969	87
		WEST 4LP		12/23/1977	84
		AEP		07/01/1978	104
		AEP		08/30/2005	91
				12/23/2037	85
			101		

**APPENDIX A**  
**U.S. Commercial Nuclear Power Reactors (continued)**  
**Operating Reactors**

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Dresden Nuclear Power Station, Unit 2 Exelon Generation Co., LLC Morris, IL (25 miles SW of Joliet, IL) 05000237 www.nrc.gov/info-finder/reactor/dres2.html	III	BWR-MARK 1 GE 3 S&L UE&C	2,957	01/10/1966 02/20/1991 <sup>A</sup> 06/09/1970 10/28/2004 12/22/2029	91 102 95 104 85 98
Dresden Nuclear Power Station, Unit 3 Exelon Generation Co., LLC Morris, IL (25 miles SW of Joliet, IL) 05000249 www.nrc.gov/info-finder/reactor/dres3.html	III	BWR-MARK 1 GE 3 S&L UE&C	2,957	10/14/1966 01/12/1971 11/16/1971 10/28/2004 01/12/2031	97 90 99 91 89 95
Duane Arnold Energy Center NextEra Energy Duane Arnold, LLC Palo, IA (8 miles NW of Cedar Rapids, IA) 05000331 www.nrc.gov/info-finder/reactor/duan.html	III	BWR-MARK 1 GE 4 BECH BECH	1,912	06/22/1970 02/22/1974 02/01/1975 12/16/2010 02/21/2034	92 89 99 83 89 79
Edwin I. Hatch Nuclear Plant, Unit 1 Southern Nuclear Operating Co. Baxley, GA (20 miles S of Vidalia, GA) 05000321 www.nrc.gov/info-finder/reactor/hat1.html	II	BWR-MARK 1 GE 4 BECH GPC	2,804	09/30/1969 10/13/1974 12/31/1975 01/15/2002 08/06/2034	94 85 98 89 94 89
Edwin I. Hatch Nuclear Plant, Unit 2 Southern Nuclear Operating Co., Inc. Baxley, GA (20 miles S of Vidalia, GA) 05000366 www.nrc.gov/info-finder/reactor/hat2.html	II	BWR-MARK 1 GE 4 BECH GPC	2,804	12/27/1972 06/13/1978 09/05/1979 01/15/2002 06/13/2038	67 96 78 98 89 99
Fermi, Unit 2 DTE Electric Company Newport, MI (25 miles NE of Toledo, OH) 05000341 www.nrc.gov/info-finder/reactor/ferm2.html	III	BWR-MARK 1 GE 4 S&L DANI	3,486	09/26/1972 07/15/1985 01/23/1988 N/A 03/20/2025	75 80 94 54 62 82
Fort Calhoun Station, Unit 1 Omaha Public Power District Ft. Calhoun, NE (19 miles N of Omaha, NE) 05000285 www.nrc.gov/info-finder/reactor/fcs.html	IV	PWR-DRYAMB CE GHDR GHDR	1,500	06/07/1968 08/09/1973 09/26/1973 11/04/2003 08/09/2033	100 102 28 0 1 100

A: AEC issued a provisional OL on 12/22/1969, allowing commercial operation. The NRC issued a full-term OL on 02/20/1991.

**APPENDIX A**  
**U.S. Commercial Nuclear Power Reactors (continued)**  
**Operating Reactors**

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Grand Gulf Nuclear Station, Unit 1 Entergy Operations, Inc. Port Gibson, MS (20 miles S of Vicksburg, MS) 05000416 <a href="http://www.nrc.gov/info-finder/reactor/gg1.html">www.nrc.gov/info-finder/reactor/gg1.html</a>	IV	BWR-MARK 3 GE 6 BECH BECH	4,408	09/04/1974 11/01/1984 07/01/1985 N/A 11/01/2024	100 88 94 70 86 82
H.B. Robinson Steam Electric Plant, Unit 2 Duke Energy Progress, Inc. Hartsville, SC (26 miles NW of Florence, SC) 05000261 <a href="http://www.nrc.gov/info-finder/reactor/rob2.html">www.nrc.gov/info-finder/reactor/rob2.html</a>	II	PWR-DRYAMB WEST 3LP EBSO EBSO	2,339	04/13/1967 07/31/1970 03/07/1971 04/19/2004 07/31/2030	104 57 100 85 85 86
Hope Creek Generating Station, Unit 1 PSEG Nuclear, LLC Hancocks Bridge, NJ (18 miles SE of Wilmington, DE) 05000354 <a href="http://www.nrc.gov/info-finder/reactor/hope.html">www.nrc.gov/info-finder/reactor/hope.html</a>	I	BWR-MARK 1 GE 4 BECH BECH	3,840	11/04/1974 07/25/1986 12/20/1986 07/20/2011 04/11/2046	95 93 103 93 80 102
Indian Point Nuclear Generating, Unit 2 Entergy Nuclear Indian Point 2, LLC Buchanan, NY (24 miles N of New York, NY) 05000247 <a href="http://www.nrc.gov/info-finder/reactor/ip2.html">www.nrc.gov/info-finder/reactor/ip2.html</a>	I	PWR-DRYAMB WEST 4LP UE&C WDCCO	3,216	10/14/1966 09/28/1973 08/01/1974 N/A 09/28/2013	98 82 98 90 77 93
Indian Point Nuclear Generating, Unit 3 Entergy Nuclear Indian Point 3, LLC Buchanan, NY (24 miles N of New York, NY) 05000286 <a href="http://www.nrc.gov/info-finder/reactor/ip3.html">www.nrc.gov/info-finder/reactor/ip3.html</a>	I	PWR-DRYAMB WEST 4LP UE&C WDCCO	3,216	08/13/1969 12/12/1975 08/30/1976 N/A 12/12/2015	85 99 90 100 94 98
James A. FitzPatrick Nuclear Power Plant Entergy Nuclear FitzPatrick, LLC Scriba, NY (6 miles NE of Oswego, NY) 05000333 <a href="http://www.nrc.gov/info-finder/reactor/fitz.html">www.nrc.gov/info-finder/reactor/fitz.html</a>	I	BWR-MARK 1 GE 4 S&W S&W	2,536	05/20/1970 10/17/1974 07/28/1975 09/08/2008 10/17/2034	99 85 97 84 89 79
Joseph M. Farley Nuclear Plant, Unit 1 Southern Nuclear Operating Co. Columbia, AL (18 miles E of Dothan, AL) 05000348 <a href="http://www.nrc.gov/info-finder/reactor/far1.html">www.nrc.gov/info-finder/reactor/far1.html</a>	II	PWR-DRYAMB WEST 3LP SSI DANI	2,775	08/16/1972 06/25/1977 12/01/1977 05/12/2005 06/25/2037	90 88 101 91 90 102

**APPENDIX A**  
**U.S. Commercial Nuclear Power Reactors (continued)**  
**Operating Reactors**

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Joseph M. Farley Nuclear Plant, Unit 2 Southern Nuclear Operating Co. Columbia, AL (18 miles E of Dothan, AL) 05000364 <a href="http://www.nrc.gov/info-finder/reactor/far2.html">www.nrc.gov/info-finder/reactor/far2.html</a>	II	PWR-DRYAMB WEST 3LP SSI BECH	2,775	08/16/1972 03/31/1981 07/30/1981 05/12/2005 03/31/2041	96 88 89 104 91 89
LaSalle County Station, Unit 1 Exelon Generation Co., LLC Marseilles, IL (11 miles SE of Ottawa, IL) 05000373 <a href="http://www.nrc.gov/info-finder/reactor/lasa1.html">www.nrc.gov/info-finder/reactor/lasa1.html</a>	III	BWR-MARK 2 GE 5 S&L CWE	3,546	09/10/1973 04/17/1982 01/01/1984 N/A 04/17/2022	99 94 101 97 95 93
LaSalle County Station, Unit 2 Exelon Generation Co., LLC Marseilles, IL (11 miles SE of Ottawa, IL) 05000374 <a href="http://www.nrc.gov/info-finder/reactor/lasa2.html">www.nrc.gov/info-finder/reactor/lasa2.html</a>	III	BWR-MARK 2 GE 5 S&L CWE	3,546	09/10/1973 12/16/1983 10/19/1984 N/A 12/16/2023	93 101 96 103 88 95
Limerick Generating Station, Unit 1 Exelon Generation Co., LLC Limerick, PA (21 miles NW of Philadelphia, PA) 05000352 <a href="http://www.nrc.gov/info-finder/reactor/lim1.html">www.nrc.gov/info-finder/reactor/lim1.html</a>	I	BWR-MARK 2 GE 4 BECH BECH	3,515	06/19/1974 08/08/1985 02/01/1986 N/A 10/26/2024	101 91 96 85 101 91
Limerick Generating Station, Unit 2 Exelon Generation Co., LLC Limerick, PA (21 miles NW of Philadelphia, PA) 05000353 <a href="http://www.nrc.gov/info-finder/reactor/lim2.html">www.nrc.gov/info-finder/reactor/lim2.html</a>	I	BWR-MARK 2 GE 4 BECH BECH	3,515	06/19/1974 08/25/1989 01/08/1990 N/A 06/22/2029	94 99 90 95 94 99
McGuire Nuclear Station, Unit 1 Duke Energy Carolinas, LLC Huntersville, NC (17 miles N of Charlotte, NC) 05000369 <a href="http://www.nrc.gov/info-finder/reactor/mcg1.html">www.nrc.gov/info-finder/reactor/mcg1.html</a>	II	PWR-ICECND WEST 4LP DUKE DUKE	3,411	02/23/1973 07/08/1981 12/01/1981 12/05/2003 06/12/2041	104 92 94 105 82 82
McGuire Nuclear Station, Unit 2 Duke Energy Carolinas, LLC Huntersville, NC (17 miles N of Charlotte, NC) 05000370 <a href="http://www.nrc.gov/info-finder/reactor/mcg2.html">www.nrc.gov/info-finder/reactor/mcg2.html</a>	II	PWR-ICECND WEST 4LP DUKE DUKE	3,411	02/23/1973 05/27/1983 03/01/1984 12/05/2003 03/03/2043	94 104 91 82 95 94

## APPENDIX A

### U.S. Commercial Nuclear Power Reactors (continued) Operating Reactors

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Millstone Power Station, Unit 2 Dominion Nuclear Connecticut, Inc. Waterford, CT (3.2 miles SW of New London, CT) 05000336 <a href="http://www.nrc.gov/info-finder/reactor/mill2.html">www.nrc.gov/info-finder/reactor/mill2.html</a>	I	PWR-DRYAMB CE BECH BECH	2,700	12/11/1970 09/26/1975 12/26/1975 11/28/2005 07/31/2035	81 97 87 83 95 85
Millstone Power Station, Unit 3 Dominion Nuclear Connecticut, Inc. Waterford, CT (3.2 miles SW of New London, CT) 05000423 <a href="http://www.nrc.gov/info-finder/reactor/mill3.html">www.nrc.gov/info-finder/reactor/mill3.html</a>	I	PWR-DRYSUB WEST 4LP S&W S&W	3,650	08/09/1974 01/31/1986 04/23/1986 11/28/2005 11/25/2045	105 86 87 100 87 87
Monticello Nuclear Generating Plant, Unit 1 Northern States Power Company-Minnesota Monticello, MN (30 miles NW of Minneapolis, MN) 05000263 <a href="http://www.nrc.gov/info-finder/reactor/mont.html">www.nrc.gov/info-finder/reactor/mont.html</a>	III	BWR-MARK 1 GE 3 BECH BECH	2,004	06/19/1967 01/09/1981 <sup>B</sup> 06/30/1971 11/08/2006 09/08/2030	83 94 69 101 50 78
Nine Mile Point Nuclear Station, Unit 1 Nine Mile Point Nuclear Station, LLC Scriba, NY (6 miles NE of Oswego, NY) 05000220 <a href="http://www.nrc.gov/info-finder/reactor/nmp1.html">www.nrc.gov/info-finder/reactor/nmp1.html</a>	I	BWR-MARK 1 GE 2 NIAG S&W	1,850	04/12/1965 12/26/1974 <sup>C</sup> 12/01/1969 10/31/2006 08/22/2029	92 97 84 87 88 98
Nine Mile Point Nuclear Station, Unit 2 Nine Mile Point Nuclear Station, LLC Scriba, NY (6 miles NE of Oswego, NY) 05000410 <a href="http://www.nrc.gov/info-finder/reactor/nmp2.html">www.nrc.gov/info-finder/reactor/nmp2.html</a>	I	BWR-MARK 2 GE 5 S&W S&W	3,988	06/24/1974 07/02/1987 03/11/1988 10/31/2006 10/31/2046	99 89 95 83 99 87
North Anna Power Station, Unit 1 Virginia Electric & Power Co. Mineral (Louisa County), VA (40 miles NW of Richmond, VA) 05000338 <a href="http://www.nrc.gov/info-finder/reactor/na1.html">www.nrc.gov/info-finder/reactor/na1.html</a>	II	PWR-DRYSUB WEST 3LP S&W S&W	2,940	02/19/1971 04/01/1978 06/06/1978 03/20/2003 04/01/2038	92 86 78 89 89 100

B: AEC issued a provisional OL on 09/08/1970, allowing commercial operation. The NRC issued a full-term OL on 01/09/1981.

C: AEC issued a provisional OL on 08/22/1969, allowing commercial operation. The NRC issued a full-term OL on 12/26/1974.

**APPENDIX A**  
**U.S. Commercial Nuclear Power Reactors (continued)**  
**Operating Reactors**

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
North Anna Power Station, Unit 2 Virginia Electric & Power Co. Mineral (Louisa County), VA (40 miles NW of Richmond, VA) 05000339 <a href="http://www.nrc.gov/info-finder/reactor/na2.html">www.nrc.gov/info-finder/reactor/na2.html</a>	II	PWR-DRYSUB WEST 3LP S&W S&W	2,940	02/19/1971 08/21/1980 12/14/1980 03/20/2003 08/21/2040	100 100 76 99 85 92
Oconee Nuclear Station, Unit 1 Duke Energy Carolinas, LLC Seneca, SC (30 miles W of Greenville, SC) 05000269 <a href="http://www.nrc.gov/info-finder/reactor/oco1.html">www.nrc.gov/info-finder/reactor/oco1.html</a>	II	PWR-DRYAMB B&W LLP DBDB DUKE	2,568	11/06/1967 02/06/1973 07/15/1973 05/23/2000 02/06/2033	85 100 79 90 91 91
Oconee Nuclear Station, Unit 2 Duke Energy Carolinas, LLC Seneca, SC (30 miles W of Greenville, SC) 05000270 <a href="http://www.nrc.gov/info-finder/reactor/oco2.html">www.nrc.gov/info-finder/reactor/oco2.html</a>	II	PWR-DRYAMB B&W LLP DBDB DUKE	2,568	11/06/1967 10/06/1973 09/09/1974 05/23/2000 10/06/2033	103 91 93 102 82 101
Oconee Nuclear Station, Unit 3 Duke Energy Carolinas, LLC Seneca, SC (30 miles W of Greenville, SC) 05000287 <a href="http://www.nrc.gov/info-finder/reactor/oco3.html">www.nrc.gov/info-finder/reactor/oco3.html</a>	II	PWR-DRYAMB B&W LLP DBDB DUKE	2,568	11/06/1967 07/19/1974 12/16/1974 05/23/2000 07/19/2034	94 91 103 86 97 92
Oyster Creek Nuclear Generating Station Exelon Generation Co., LLC Forked River, NJ (9 miles S of Toms River, NJ) 05000219 <a href="http://www.nrc.gov/info-finder/reactor/oc.html">www.nrc.gov/info-finder/reactor/oc.html</a>	I	BWR-MARK 1 GE 2 B&R B&R	1,930	12/15/1964 07/02/1991 <sup>D</sup> 12/23/1969 04/08/2009 04/09/2029	92 85 98 88 106 90
Palisades Nuclear Plant Entergy Nuclear Operations, Inc. Covert, MI (5 miles S of South Haven, MI) 05000255 <a href="http://www.nrc.gov/info-finder/reactor/pali.html">www.nrc.gov/info-finder/reactor/pali.html</a>	III	PWR-DRYAMB CE BECH BECH	2,565.4	03/14/1967 02/21/1991 <sup>E</sup> 12/31/1971 01/17/2007 03/24/2031	90 92 96 74 85 86
Palo Verde Nuclear Generating Station, Unit 1 Arizona Public Service Company Wintersburg, AZ (50 miles W of Phoenix, AZ) 05000528 <a href="http://www.nrc.gov/info-finder/reactor/palo1.html">www.nrc.gov/info-finder/reactor/palo1.html</a>	IV	PWR-DRYAMB CE80-2L BECH BECH	3,990	05/25/1976 06/01/1985 01/28/1986 04/21/2011 06/01/2045	101 81 83 100 85 90

D: AEC issued a provisional OL on 04/09/1969, allowing commercial operation. The NRC issued a full-term OL on 07/02/1991.

E: AEC issued a provisional OL on 03/24/1971, allowing commercial operation. The NRC issued a full-term OL on 02/21/1991.

## APPENDIX A

### U.S. Commercial Nuclear Power Reactors (continued) Operating Reactors

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Palo Verde Nuclear Generating Station, Unit 2 Arizona Public Service Company Wintersburg, AZ (50 miles W of Phoenix, AZ) 05000529 <a href="http://www.nrc.gov/info-finder/reactor/palo2.html">www.nrc.gov/info-finder/reactor/palo2.html</a>	IV	PWR-DRYAMB CE80-2L BECH BECH	3,990	05/25/1976	83
				04/24/1986	101
				09/19/1986	91
				04/21/2011	90
				04/24/2046	91
Palo Verde Nuclear Generating Station, Unit 3 Arizona Public Service Company Wintersburg, AZ (50 miles W of Phoenix, AZ) 05000530 <a href="http://www.nrc.gov/info-finder/reactor/palo3.html">www.nrc.gov/info-finder/reactor/palo3.html</a>	IV	PWR-DRYAMB CE80-2L BECH BECH	3,990	05/25/1976	83
				11/25/1987	89
				01/08/1988	97
				04/21/2011	88
				11/25/2047	79
Peach Bottom Atomic Power Station, Unit 2 Exelon Generation Co., LLC Delta, PA (17.9 miles S of Lancaster, PA) 05000277 <a href="http://www.nrc.gov/info-finder/reactor/pb2.html">www.nrc.gov/info-finder/reactor/pb2.html</a>	I	BWR-MARK 1 GE 4 BECH BECH	3,514	01/31/1968	102
				10/25/1973	92
				07/05/1974	101
				05/07/2003	88
				08/08/2033	100
Peach Bottom Atomic Power Station, Unit 3 Exelon Generation Co., LLC Delta, PA (17.9 miles S of Lancaster, PA) 05000278 <a href="http://www.nrc.gov/info-finder/reactor/pb3.html">www.nrc.gov/info-finder/reactor/pb3.html</a>	I	BWR-MARK 1 GE 4 BECH BECH	3,514	01/31/1968	89
				07/02/1974	100
				12/23/1974	90
				05/07/2003	103
				07/02/2034	85
Perry Nuclear Power Plant, Unit 1 FirstEnergy Nuclear Operating Co. Perry, OH (35 miles NE of Cleveland, OH) 05000440 <a href="http://www.nrc.gov/info-finder/reactor/perr1.html">www.nrc.gov/info-finder/reactor/perr1.html</a>	III	BWR-MARK 3 GE 6 GIL KAIS	3,758	05/03/1977	67
				11/13/1986	98
				11/18/1987	79
				N/A	92
				03/18/2026	73
Pilgrim Nuclear Power Station Entergy Nuclear Operations, Inc. Plymouth, MA (38 miles SE of Boston, MA) 05000293 <a href="http://www.nrc.gov/info-finder/reactor/pilg.html">www.nrc.gov/info-finder/reactor/pilg.html</a>	I	BWR-MARK 1 GE 3 BECH BECH	2,028	08/26/1968	90
				06/08/1972	99
				12/01/1972	85
				05/29/2012	98
				06/08/2032	74
Point Beach Nuclear Plant, Unit 1 NextEra Energy Point Beach, LLC Two Rivers, WI (13 miles NW of Manitowoc, WI) 05000266 <a href="http://www.nrc.gov/info-finder/reactor/poin1.html">www.nrc.gov/info-finder/reactor/poin1.html</a>	III	PWR-DRYAMB WEST 2LP BECH BECH	1,800	07/19/1967	98
				10/05/1970	88
				12/21/1970	79
				12/22/2005	100
				10/05/2030	84
					90

**APPENDIX A**  
**U.S. Commercial Nuclear Power Reactors (continued)**  
**Operating Reactors**

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Point Beach Nuclear Plant, Unit 2 NextEra Energy Point Beach, LLC Two Rivers, WI (13 miles NW of Manitowoc, WI) 05000301 www.nrc.gov/info-finder/reactor/poin2.html	III	PWR-DRYAMB WEST 2LP BECH BECH	1,800	07/25/1968	84
				03/08/1973 <sup>F</sup>	96
				10/01/1972	67
				12/22/2005	89
				03/08/2033	93
90					
Prairie Island Nuclear Generating Plant, Unit 1 Northern States Power Co.—Minnesota Welch, MN (28 miles SE of Minneapolis, MN) 05000282 www.nrc.gov/info-finder/reactor/prai1.html	III	PWR-DRYAMB WEST 2LP FLUR NSP	1,677	06/25/1968	97
				04/05/1974 <sup>G</sup>	96
				12/16/1973	91
				06/27/2011	81
				08/09/2033	90
84					
Prairie Island Nuclear Generating Plant, Unit 2 Northern States Power Co.—Minnesota Welch, MN (28 miles SE of Minneapolis, MN) 05000306 www.nrc.gov/info-finder/reactor/prai2.html	III	PWR-DRYAMB WEST 2LP FLUR NSP	1,677	06/25/1968	75
				10/29/1974	86
				12/21/1974	99
				06/27/2011	74
				10/29/2034	59
101					
Quad Cities Nuclear Power Station, Unit 1 Exelon Generation Co., LLC Cordova, IL (20 miles NE of Moline, IL) 05000254 www.nrc.gov/info-finder/reactor/quad1.html	III	BWR-MARK 1 GE 3 S&L UE&C	2,957	02/15/1967	82
				12/14/1972	99
				02/18/1973	92
				10/28/2004	102
				12/14/2032	85
103					
Quad Cities Nuclear Power Station, Unit 2 Exelon Generation Co., LLC Cordova, IL (20 miles NE of Moline, IL) 05000265 www.nrc.gov/info-finder/reactor/quad2.html	III	BWR-MARK 1 GE 3 S&L UE&C	2,957	02/15/1967	91
				12/14/1972	92
				03/10/1973	104
				10/28/2004	92
				12/14/2032	91
90					
River Bend Station, Unit 1 Entergy Nuclear Operations, Inc. St. Francisville, LA (24 miles NW of Baton Rouge, LA) 05000458 www.nrc.gov/info-finder/reactor/rbs1.html	IV	BWR-MARK 3 GE 6 S&W S&W	3,091	03/25/1977	113
				11/20/1985	98
				06/16/1986	90
				N/A	91
				08/29/2025	84
96					

F: AEC issued a provisional OL on 11/18/1971. The NRC issued a full-term OL on 03/08/1973.

G: AEC issued a provisional OL on 08/09/1973. The NRC issued a full-term OL on 04/05/1974.

## APPENDIX A

### U.S. Commercial Nuclear Power Reactors (continued) Operating Reactors

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
R.E. Ginna Nuclear Power Plant R.E. Ginna Nuclear Power Plant, LLC Ontario, NY (20 miles NE of Rochester, NY) 05000244 <a href="http://www.nrc.gov/info-finder/reactor/ginn.html">www.nrc.gov/info-finder/reactor/ginn.html</a>	I	PWR-DRYAMB WEST 2LP GIL BECH	1,775	04/25/1966 09/19/1969 07/01/1970 05/19/2004 09/18/2029	91 97 84 90 93 91
St. Lucie Plant, Unit 1 Florida Power & Light Co. Jensen Beach, FL (10 miles SE of Ft. Pierce, FL) 05000335 <a href="http://www.nrc.gov/info-finder/reactor/stl1.html">www.nrc.gov/info-finder/reactor/stl1.html</a>	II	PWR-DRYAMB CE EBSO EBSO	3,020	07/01/1970 03/01/1976 12/21/1976 10/02/2003 03/01/2036	100 72 85 72 74 101
St. Lucie Plant, Unit 2 Florida Power & Light Co. Jensen Beach, FL (10 miles SE of Ft. Pierce, FL) 05000389 <a href="http://www.nrc.gov/info-finder/reactor/stl2.html">www.nrc.gov/info-finder/reactor/stl2.html</a>	II	PWR-DRYAMB CE EBSO EBSO	3,020	05/02/1977 06/10/1983 08/08/1983 10/02/2003 04/06/2043	80 100 66 68 91 82
Salem Nuclear Generating Station, Unit 1 PSE&G Nuclear, LLC Hancocks Bridge, NJ (18 miles SE of Wilmington, DE) 05000272 <a href="http://www.nrc.gov/info-finder/reactor/salm1.html">www.nrc.gov/info-finder/reactor/salm1.html</a>	I	PWR-DRYAMB WEST 4LP PSEG UE&C	3,459	09/25/1968 12/01/1976 06/30/1977 06/30/2011 08/13/2036	99 85 86 97 88 86
Salem Nuclear Generating Station, Unit 2 PSE&G Nuclear, LLC Hancocks Bridge, NJ (18 miles SE of Wilmington, DE) 05000311 <a href="http://www.nrc.gov/info-finder/reactor/salm2.html">www.nrc.gov/info-finder/reactor/salm2.html</a>	I	PWR-DRYAMB WEST 4LP PSEG UE&C	3,459	09/25/1968 05/20/1981 10/13/1981 06/30/2011 04/18/2040	93 98 89 88 100 73
Seabrook Station, Unit 1 NextEra Energy Seabrook, LLC Seabrook, NH (13 miles S of Portsmouth, NH) 05000443 <a href="http://www.nrc.gov/info-finder/reactor/seab1.html">www.nrc.gov/info-finder/reactor/seab1.html</a>	I	PWR-DRYAMB WEST 4LP UE&C UE&C	3,648	07/07/1976 03/15/1990 08/19/1990 N/A 03/15/2030	81 100 77 75 100 93
Sequoyah Nuclear Plant, Unit 1 Tennessee Valley Authority Soddy-Daisy, TN (16 miles NE of Chattanooga, TN) 05000327 <a href="http://www.nrc.gov/info-finder/reactor/seq1.html">www.nrc.gov/info-finder/reactor/seq1.html</a>	II	PWR-ICECND WEST 4LP TVA TVA	3,455	05/27/1970 09/17/1980 07/01/1981 N/A 09/17/2020	89 84 98 89 83 100

**APPENDIX A**  
**U.S. Commercial Nuclear Power Reactors (continued)**  
**Operating Reactors**

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Sequoyah Nuclear Plant, Unit 2 Tennessee Valley Authority Soddy-Daisy, TN (16 miles NE of Chattanooga, TN) 05000328 www.nrc.gov/info-finder/reactor/seq2.html	II	PWR-ICECND WEST 4LP TVA TVA	3,455	05/27/1970 09/15/1981 06/01/1982 N/A 09/15/2021	89 97 89 77 90 90
Shearon Harris Nuclear Power Plant, Unit 1 Duke Energy Progress, Inc. New Hill, NC (20 miles SW of Raleigh, NC) 05000400 www.nrc.gov/info-finder/reactor/har1.html	II	PWR-DRYAMB WEST 3LP EBSO DANI	2,900	01/27/1978 10/24/1986 05/02/1987 12/17/2008 10/24/2046	94 90 103 90 83 99
South Texas Project, Unit 1 STP Nuclear Operating Co. Bay City, TX (90 miles SW of Houston, TX) 05000498 www.nrc.gov/info-finder/reactor/stp1.html	IV	PWR-DRYAMB WEST 4LP BECH EBSO	3,853	12/22/1975 03/22/1988 08/25/1988 N/A 08/20/2027	90 101 94 93 91 81
South Texas Project, Unit 2 STP Nuclear Operating Co. Bay City, TX (90 miles SW of Houston, TX) 05000499 www.nrc.gov/info-finder/reactor/stp2.html	IV	PWR-DRYAMB WEST 4LP BECH EBSO	3,853	12/22/1975 03/28/1989 06/19/1989 N/A 12/15/2028	101 88 88 72 59 103
Surry Power Station, Unit 1 Virginia Electric and Power Co. Surry, VA (17 miles NW of Newport News, VA) 05000280 www.nrc.gov/info-finder/reactor/sur1.html	II	PWR-DRYSUB WEST 3LP S&W S&W	2,587	06/25/1968 05/25/1972 12/22/1972 03/20/2003 05/25/2032	94 89 101 92 91 99
Surry Power Station, Unit 2 Virginia Electric and Power Co. Surry, VA (17 miles NW of Newport News, VA) 05000281 www.nrc.gov/info-finder/reactor/sur2.html	II	PWR-DRYSUB WEST 3LP S&W S&W	2,587	06/25/1968 01/29/1973 05/01/1973 03/20/2003 01/29/2033	92 100 76 91 101 95
Susquehanna Steam Electric Station, Unit 1 PPL Susquehanna, LLC Berwick, PA (70 miles NE of Harrisburg, PA) 05000387 www.nrc.gov/info-finder/reactor/susq1.html	I	BWR-MARK 2 GE 4 BECH BECH	3,952	11/03/1973 07/17/1982 06/08/1983 11/24/2009 07/17/2042	101 80 86 70 87 83

## APPENDIX A

### U.S. Commercial Nuclear Power Reactors (continued) Operating Reactors

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Susquehanna Steam Electric Station, Unit 2 PPL Susquehanna, LLC Berwick, PA (70 miles NE of Harrisburg, PA) 05000388 www.nrc.gov/info-finder/reactor/susq2.html	I	BWR-MARK 2 GE 4 BECH BECH	3,952	11/03/1973 03/23/1984 02/12/1985 11/24/2009 03/23/2044	90 96 72 83 80 88
Three Mile Island Nuclear Station, Unit 1 Exelon Generation Co., LLC Middletown, PA (10 miles SE of Harrisburg, PA) 05000289 www.nrc.gov/info-finder/reactor/tmi1.html	I	PWR-DRYAMB B&W LLP GIL UE&C	2,568	05/18/1968 04/19/1974 09/02/1974 10/22/2009 04/19/2034	86 94 92 100 78 104
Turkey Point Nuclear Generating, Unit 3 Florida Power & Light Co. Homestead, FL (20 miles S of Miami, FL) 05000250 www.nrc.gov/info-finder/reactor/tp3.html	II	PWR-DRYAMB WEST 3LP BECH BECH	2,644	04/27/1967 07/19/1972 12/14/1972 06/06/2002 07/19/2032	86 88 96 40 81 84
Turkey Point Nuclear Generating, Unit 4 Florida Power & Light Co. Homestead, FL (20 miles S of Miami, FL) 05000251 www.nrc.gov/info-finder/reactor/tp4.html	II	PWR-DRYAMB WEST 3LP BECH BECH	2,644	04/27/1967 04/10/1973 09/07/1973 06/06/2002 04/10/2033	99 98 84 85 70 88
Virgil C. Summer Nuclear Station, Unit 1 South Carolina Electric & Gas Co. Jenkinsville, SC (26 miles NW of Columbia, SC) 05000395 www.nrc.gov/info-finder/reactor/sum.html	II	PWR-DRYAMB WEST 3LP GIL DANI	2,900	03/21/1973 11/12/1982 01/01/1984 04/23/2004 08/06/2042	81 100 88 86 93 81
Vogtle Electric Generating Plant, Unit 1 Southern Nuclear Operating Co., Inc. Waynesboro, GA (26 miles SE of Augusta, GA) 05000424 www.nrc.gov/info-finder/reactor/vog1.html	II	PWR-DRYAMB WEST 4LP SBEC GPC	3,625.6	06/28/1974 03/16/1987 06/01/1987 06/03/2009 01/16/2047	91 102 92 91 101 87
Vogtle Electric Generating Plant, Unit 2 Southern Nuclear Operating Co., Inc. Waynesboro, GA (26 miles SE of Augusta, GA) 05000425 www.nrc.gov/info-finder/reactor/vog2.html	II	PWR-DRYAMB WEST 4LP SBEC GPC	3,625.6	06/28/1974 03/31/1989 05/20/1989 06/03/2009 02/09/2049	101 93 94 102 87 92

**APPENDIX A**  
**U.S. Commercial Nuclear Power Reactors (continued)**  
**Operating Reactors**

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Waterford Steam Electric Station, Unit 3 Entergy Operations, Inc. Killona, LA (25 miles W of New Orleans, LA) 05000382 <a href="http://www.nrc.gov/info-finder/reactor/wat3.html">www.nrc.gov/info-finder/reactor/wat3.html</a>	IV	PWR-DRYAMB COMB CE EBSO EBSO	3,716	11/14/1974 03/16/1985 09/24/1985 N/A 12/18/2024	87 100 82 77 89 90
Watts Bar Nuclear Plant, Unit 1 Tennessee Valley Authority Spring City, TN (60 miles SW of Knoxville, TN) 05000390 <a href="http://www.nrc.gov/info-finder/reactor/wb1.html">www.nrc.gov/info-finder/reactor/wb1.html</a>	II	PWR-ICECND WEST 4LP TVA TVA	3,459	01/23/1973 02/07/1996 05/27/1996 N/A 11/09/2035	94 99 84 87 90 89
Wolf Creek Generating Station, Unit 1 Wolf Creek Nuclear Operating Corp. Burlington (Coffey County), KS (28 miles SE of Emporia, KS) 05000482 <a href="http://www.nrc.gov/info-finder/reactor/wc.html">www.nrc.gov/info-finder/reactor/wc.html</a>	IV	PWR-DRYAMB WEST 4LP BECH DANI	3,565	05/17/1977 06/04/1985 <sup>H</sup> 09/03/1985 11/20/2008 03/11/2045	86 86 72 80 65 83

H: The original OL (NPF-32) was issued on 03/11/1985. The license was superseded by OL (NPF-42), issued on 06/04/1985.

## APPENDIX A

### U.S. Commercial Nuclear Power Reactors (continued) Operating Reactors Under Active Construction or Deferred Policy

Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt	CP Issued OL Issued Comm. Op. LR Issued Exp. Date	2009– 2014* Capacity Factor (Percent)
Bellefonte Nuclear Power Station, Unit 1** Tennessee Valley Authority (6 miles NE of Scottsboro, AL) 05000438	II	PWR-DRYAMB B&W 205 TVA TVA	3,763	12/24/1974	N/A
Bellefonte Nuclear Power Station, Unit 2** Tennessee Valley Authority (6 miles NE of Scottsboro, AL) 05000439	II	PWR-DRYAMB B&W 205 TVA TVA	3,763	12/24/1974	N/A
Watts Bar Nuclear Plant, Unit 2*** Tennessee Valley Authority Spring City, TN (60 miles SW of Knoxville, TN) 05000391 <a href="http://www.nrc.gov/info-finder/reactor/wb/watts-bar.html">www.nrc.gov/info-finder/reactor/wb/watts-bar.html</a>	II	PWR-ICECND WEST 4LP TVA TVA	3,411	01/23/1973	N/A
Virgil C. Summer Nuclear Station, Unit 2 South Carolina Electric & Gas Co. South Carolina Public Service Auth. Jenkinsville (Fairfield County), SC (26 miles NW of Columbia, SC) 0500027	II	PWR AP1000 WEST SHAW	3,400	03/30/2012	N/A
Virgil C. Summer Nuclear Station, Unit 3 South Carolina Electric & Gas Co. South Carolina Public Service Auth. Jenkinsville (Fairfield County), SC (26 miles NW of Columbia, SC) 05200028	II	PWR AP1000 WEST SHAW	3,400	03/30/2012	N/A
Vogtle Electric Generating Plant, Unit 3 Southern Nuclear Operating Co., Inc. Waynesboro (Burke County), GA (26 miles SE of Augusta, GA) 05200025	II	PWR AP1000 WEST SHAW	3,400	02/10/2012	N/A
Vogtle Electric Generating Plant, Unit 4 Southern Nuclear Operating Co., Inc. Waynesboro, (Burke County), GA (26 miles SE of Augusta, GA) 05200026	II	PWR AP1000 WEST SHAW	3,400	02/10/2012	N/A
Fermi, Unit 3 DTE Electric Company Newport, MI (25 miles NE of Toledo, OH) 05200033	III	ESBWR GEH	4,500	05/01/2015	N/A

\* Average capacity factor is listed in year order starting with 2009.

\*\* Bellefonte Units 1 and 2 are under the Commission Policy Statement on Deferred Plants (52 FR 38077; October 14, 1987).

\*\*\* Watts Bar Unit 2 is currently under active construction.

Source: NRC, with some data compiled from EIA/DOE

Note: Plant names are as identified on the license as of August 2015.

## APPENDIX B

## U.S. New Nuclear Power Plant Licensing Applications

Applicant	Docket Number	Type	Submittal Date	Design	Site	State	Existing Plant?	Date Accepted	Status
<b>Combined Operating License</b>									
Nuclear Innovation North America, LLC (NINA)	05200012 & 05200013	COL	9/20/07	ABWR	South Texas Project, Units 3 and 4	TX	Yes	11/29/07	Scheduled
Tennessee Valley Authority (TVA)	05200014 & 05200015	COL	10/30/07	AP1000	Bellefonte, Units 3 and 4	AL	No	1/18/08	Suspended – 09/29/2010
Dominion Virginia Power	05200017	COL	11/27/07	ESBWR	North Anna, Unit 3	VA	Yes	01/28/08	Scheduled
Duke Energy Carolinas	05200018 & 05200019	COL	12/13/07	AP1000	Lee Nuclear Station, Units 3 and 4	SC	No	2/25/08	Scheduled
Progressive Energy	05200022 & 05200023	COL	2/19/08	AP1000	Shearon Harris, Units 2 and 3	NC	Yes	4/17/08	Suspended – 05/02/2013
Southern Nuclear Operating Co.	05200025 & 05200026	COL	3/31/08	AP1000	Vogtle, Units 3 and 4	GA	Yes	5/30/08	COL Issued 02/10/2012
South Carolina Electric and Gas	05200027 & 05200028	COL	3/31/08	AP1000	V.C. Summer, Units 2 and 3	SC	Yes	7/31/08	COL Issued 03/30/2012
AmerenUE	05200037	COL	7/24/08	U.S. EPR	Callaway, Unit 2	MO	Yes	12/12/08	Suspended
Duke Energy Florida	05200029 & 05200030	COL	7/30/08	AP1000	Levy County, Units 1 and 2	FL	No	10/6/08	Scheduled
DTE Electric Company	05200033	COL	9/18/08	ESBWR	Fermi, Unit 3	MI	Yes	11/25/08	COL Issued 05/01/2015
Luminant Generation Co.	05200034 & 05200035	COL	9/19/08	US APWR	Comanche Peak, Units 3 and 4	TX	Yes	12/2/08	Suspended – 03/31/2014
Entergy	05200036	COL	9/25/08	ESBWR	River Bend, Unit 3	LA	Yes	12/4/08	Suspended – 01/09/2009
PPL Bell Bend	05200039	COL	10/10/08	U.S. EPR	Bell Bend (1 Unit)	PA	Yes	12/19/08	Safety review on hold; Environmental review scheduled
Florida Power and Light	05200040 & 05200041	COL	6/30/09	AP1000	Turkey Point, Units 6 and 7	FL	Yes	9/4/09	Scheduled
<b>Design Certification</b>									
AREVA NP	05200020	DC	12/11/07	U.S. EPR	N/A	N/A	N/A	2/25/08	Suspended – 03/27/2015
Mitsubishi Heavy Industries	05200021	DC	12/31/07	US APWR	N/A	N/A	N/A	2/29/08	Applicant Delayed – Not Scheduled
Korea Electric Power Company and Korea Hydro and Nuclear Power	05200046	DC	12/23/14	APR 1400	N/A	N/A	N/A	3/4/15	Scheduled
Toshiba Corporation	05200044	DC	10/27/10	ABWR	N/A	N/A	N/A	12/14/10	Applicant Delayed – Not Scheduled
GE-Hitachi Nuclear Energy	05200045	DC	12/7/10	ABWR	N/A	N/A	N/A	2/14/11	Applicant Delayed – Not Scheduled
<b>Early Site Permit</b>									
PSEG Site	05200043	ESP	5/25/10	Not yet announced	PSEG Site	NJ	Yes	8/4/10	Scheduled

Note: Data is as of July 2015. Withdrawal was requested for Calvert Cliffs, Grand Gulf, Nine Mile Point and Victoria County (COL and ESP). NRC-abbreviated reactor names listed

## APPENDIX C

### U.S. Commercial Nuclear Power Reactors Undergoing Decommissioning and Permanently Shut Down Formerly Licensed To Operate

Unit Location Docket Number	Reactor Type MWT	NSSS Vendor	OL Issued Shut Down OL Terminated Closure Date Est.	Decommissioning Alternative Selected Current License Status
Big Rock Point Charlevoix, MI 05000155	BWR 240	GE	05/01/1964 08/29/1997 01/08/2007	DECON DECON Completed
Crystal River 3 Crystal River, FL 05000302	PWR 2,609	B&W LLP	12/03/1976 02/20/2013  2074	SAFSTOR SAFSTOR In Progress
Dresden 1 Morris, IL 0500010	BWR 700	GE	09/28/1959 10/31/1978  2036	SAFSTOR SAFSTOR
GE EVESR Sunol, CA 05000183	Experimental Superheat Reactor 12.5	GE	11/12/1963 2/1/1967 4/15/1970 1/1/2019	SAFSTOR Possession only license expires 1/2016
GE VBWR (Vallecitos) Sunol, CA 05000017	BWR 50	GE	08/31/1957 12/09/1963  2019	SAFSTOR SAFSTOR
Fermi 1 Newport, MI 05000016	SCF 200	CE	05/10/1963 09/22/1972  2032	SAFSTOR DECON
Fort St. Vrain Platteville, CO 05000267	HTG 842	GA	12/21/1973 08/18/1989 08/08/1997	DECON DECON Completed
Haddam Neck Meriden, CT 05000213	PWR 1,825	WEST	12/27/1974 12/05/1996 11/26/2007	DECON DECON Completed
Humboldt Bay 3 Eureka, CA 05000133	BWR 200	GE	08/28/1962 07/02/1976  2015	DECON DECON In Progress
Indian Point 1 Buchanan, NY 05000003	PWR 615	B&W	03/26/1962 10/31/1974  2026	SAFSTOR SAFSTOR

## APPENDIX C

**U.S. Commercial Nuclear Power Reactors  
Undergoing Decommissioning and Permanently Shut Down  
Formerly Licensed To Operate (continued)**

<b>Unit Location Docket Number</b>	<b>Reactor Type MWT</b>	<b>NSSS Vendor</b>	<b>OL Issued Shut Down OL Terminated Closure Date Est.</b>	<b>Decommissioning Alternative Selected Current License Status</b>
Kewaunee Carlton, WI 05000305	PWR 1,772	WEST 2LP	12/21/1973 05/07/2013  2073	SAFSTOR SAFSTOR
La Crosse Genoa, WI 05000409	BWR 165	AC	07/03/1967 04/30/1987 TBD	DECON DECON in Progress
Maine Yankee Wiscasset, ME 05000309	PWR 2,700	CE	06/29/1973 12/06/1996 09/30/2005	DECON DECON Completed
Millstone 1 Waterford, CT 05000245	BWR 2,011	GE	10/31/1970 07/21/1998 12/31/2056	SAFSTOR SAFSTOR
Pathfinder Sioux Falls, SD 05000130	BWR 190	AC	03/12/1964 09/16/1967 07/27/2007	DECON DECON Completed
Peach Bottom 1 Delta, PA 05000171	HTG 115	GA	01/24/1966 10/31/1974 12/31/2034	SAFSTOR SAFSTOR
Rancho Seco Herald, CA 05000312	PWR 2,772	B&W	08/16/1974 06/07/1989 09/25/2009	DECON DECON Completed
San Onofre 1* San Clemente, CA 05000206	PWR 1,347	WEST	03/27/1967 11/30/1992 12/30/2030	DECON SAFSTOR
San Onofre 2* San Clemente, CA 05000361	PWR CE 3,438	CE	02/16/1982 06/12/2013  2030	DECON DECON in Progress
San Onofre 3 San Clemente, CA 05000362	PWR CE 3,438	CE	11/15/1982 06/12/2013  2030	DECON DECON in Progress
Savannah, N.S. Baltimore, MD 05000238	PWR 74	B&W	08/1965 11/1970 12/01/2031	SAFSTOR SAFSTOR

## APPENDIX C

### U.S. Commercial Nuclear Power Reactors Undergoing Decommissioning and Permanently Shut Down Formerly Licensed To Operate (continued)

Unit Location Docket Number	Reactor Type MwT	NSSS Vendor	OL Issued Shut Down OL Terminated Closure Date Est.	Decommissioning Alternative Selected Current License Status
Saxton Saxton, PA 05000146	PWR 23.5	WEST	11/15/1961 05/01/1972 11/07/2005	DECON DECON Completed
Shoreham Wading River, NY 05000322	BWR 2,436	GE	04/21/1989 06/28/1989 04/11/1995	DECON DECON Completed
Three Mile Island 2 Middletown, PA 05000320	PWR 2,770	B&W	02/08/1978 03/28/1979 12/31/2036	(1)
Trojan Rainier, OR 05000344	PWR 3,411	WEST	11/21/1975 11/09/1992 05/23/2005	DECON DECON Completed
Yankee-Rowe Rowe, MA 05000029	PWR 600	WEST	12/24/1963 10/01/1991 08/10/2007	DECON DECON Completed
Vermont Yankee Vernon, VT 05000271	BWR-MARK 1 1,912	GE 4	03/21/1972 12/29/2014  2073	SAFSTOR SAFSTOR In progress
Zion 1 Zion, IL 05000295	PWR 3,250	WEST	10/19/1973 02/21/1997	DECON DECON In Progress
Zion 2 Zion, IL 05000304	PWR 3,250	WEST	11/14/1973 09/19/1996  2020	DECON DECON In Progress

\* Site has been dismantled and decontaminated with the exception of the reactor vessel in long-term storage.

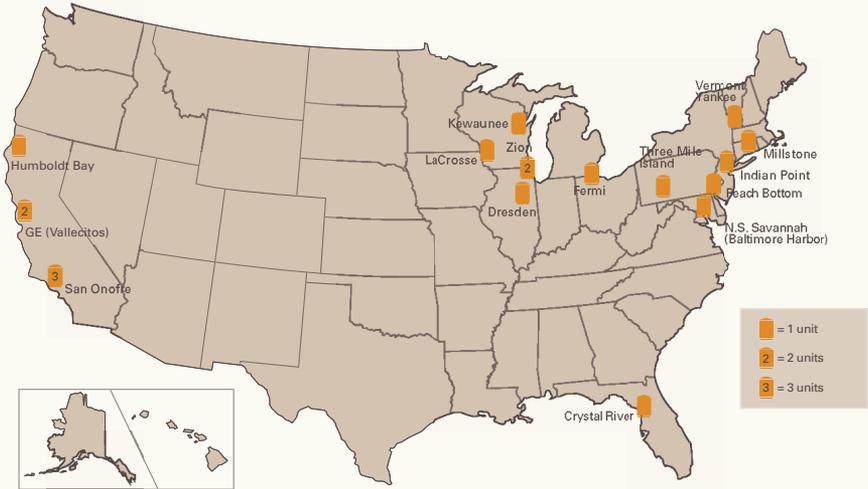
Notes: GE Bonus, Hallam, and Piqua decommissioned reactor sites are part of the DOE Nuclear Legacy. For more information, visit DOE's Legacy Management Web site at [energy.gov/lm/sites/lm-sites](http://energy.gov/lm/sites/lm-sites). CVTR, Elk River, and Shippingport decommissioned reactor sites were either decommissioned prior to the formation of the NRC or were not licensed by the NRC. See Glossary for definitions of decommissioning alternatives (DECON, SAFSTOR).

(1) Three Mile Island Unit 2 has been placed in a postdefueling monitored storage mode until Unit 1 permanently ceases operation, at which time both units are planned to be decommissioned.

Source: DOE Integrated Database for 1990, "U.S. Spent Fuel and Radioactive Waste, Inventories, Projections, and Characteristics" (DOE/RW-0006, Rev. 6), and NRC, "Nuclear Power Plants in the World," Edition 6

**APPENDIX C**

**U.S. Commercial Nuclear Power Reactors Undergoing Decommissioning and Permanently Shut Down Formerly Licensed To Operate (continued)**



Reactor Decommissioning Sites

## APPENDIX D

### Cancelled U.S. Commercial Nuclear Power Reactors Part 50—Domestic Licensing of Production and Utilization Facilities

Unit Utility Location	Con Type MWe per Unit	Cancelled Date Status Docket Number
Allens Creek 1 Houston Lighting & Power Company 4 miles NW of Wallis, TX	BWR 1,150	1982 Under CP Review 05000466
Allens Creek 2 Houston Lighting & Power Company 4 miles NW of Wallis, TX	BWR 1,150	1976 Under CP Review 05000467
Atlantic 1 & 2 Public Service Electric & Gas Company Floating Plants off the Coast of NJ	PWR 1,150	1978 Under CP Review 05000477 & 478
Bailly 1 Northern Indiana Public Service Company 12 miles NNE of Gary, IN	BWR 645	1981 With CP 05000367
Barton 1 & 2 Alabama Power & Light 15 miles SE of Clanton, AL	BWR 1,159	1977 Under CP Review 05000524 & 525
Barton 3 & 4 Alabama Power & Light 15 miles SE of Clanton, AL	BWR 1,159	1975 Under CP Review 05000526 & 527
Black Fox 1 & 2 Public Service Company of Oklahoma 3.5 miles S of Inola, OK	BWR 1,150	1982 Under CP Review 05000556 & 557
Blue Hills 1 & 2 Gulf States Utilities Company SW tip of Toledo Bend Reservoir, TX	PWR 918	1978 Under CP Review 05000510 & 511
Callaway 2 Union Electric Company 25 miles ENE of Jefferson City, MO	PWR 1,150	1981 With CP 05000486
Cherokee 1 Duke Power Company 6 miles SSW of Blacksburg, SC	PWR 1,280	1983 With CP 05000491
Cherokee 2 & 3 Duke Power Company 6 miles SSW of Blacksburg, SC	PWR 1,280	1982 With CP 05000492 & 493
Clinch River Project Management Corp., DOE, TVA 23 miles W of Knoxville, in Oak Ridge, TN	LMFB 350	1983 Under CP Review 05000537
Clinton 2 Illinois Power Company 6 miles E of Clinton, IL	BWR 933	1983 With CP 05000462

## APPENDIX D

## Cancelled U.S. Commercial Nuclear Power Reactors

## Part 50—Domestic Licensing of Production and Utilization Facilities (continued)

Unit Utility Location	Con Type MWe per Unit	Cancelled Date Status Docket Number
Davis-Besse 2 & 3 Toledo Edison Company 21 miles ESE of Toledo, OH	PWR 906	1981 Under CP Review 05000500 & 501
Douglas Point 1 & 2 Potomac Electric Power Company Charles County, MD	BWR 1,146	1977 Under CP Review 05000448 & 449
Erie 1 & 2 Ohio Edison Company Berlin, OH	PWR 1,260	1980 Under CP Review 05000580 & 581
Forked River 1 Jersey Central Power & Light Company 2 miles S of Forked River, NJ	PWR 1,070	1980 With CP 05000363
Fort Calhoun 2 Omaha Public Power District 19 miles N of Omaha, NE	PWR 1,136	1977 Under CP Review 05000548
Fulton 1 & 2 Philadelphia Electric Company 17 miles S of Lancaster, PA	HTG 1,160	1975 Under CP Review 05000463 & 464
Grand Gulf 2 Entergy Nuclear Operations, Inc. 20 miles SW of Vicksburg, MS	BWR 1,250	1990 With CP 05000417
Greene County Power Authority of the State of NY 20 miles N of Kingston, NY	PWR 1,191	1980 Under CP Review 05000549
Greenwood 2 & 3 Detroit Edison Company Greenwood Township, MI	PWR 1,200	1980 Under CP Review 05000452 & 453
Hartsville A1 & A2 Tennessee Valley Authority 5 miles SE of Hartsville, TN	BWR 1,233	1984 With CP 05000518 & 519
Hartsville B1 & B2 Tennessee Valley Authority 5 miles SE of Hartsville, TN	BWR 1,233	1982 With CP 05000520 & 521
Haven 1 (formerly Koshkonong) Wisconsin Electric Power Company 4.2 miles SSW of Fort Atkinson, WI	PWR 900	1980 Under CP Review 05000502
Haven 2 (formerly Koshkonong) Wisconsin Electric Power Company 4.2 miles SSW of Fort Atkinson, WI	PWR 900	1978 Under CP Review 05000503

## APPENDIX D

### Cancelled U.S. Commercial Nuclear Power Reactors

#### Part 50—Domestic Licensing of Production and Utilization Facilities (continued)

Unit Utility Location	Con Type MWe per Unit	Cancelled Date Status Docket Number
Hope Creek 2 Public Service Electric & Gas Company 18 miles SE of Wilmington, DE	BWR 1,067	1981 With CP 05000355
Jamesport 1 & 2 Long Island Lighting Company 65 miles E of New York City, NY	PWR 1,150	1980 With CP 05000516 & 517
Marble Hill 1 & 2 Public Service of Indiana 6 miles NE of New Washington, IN	PWR 1,130	1985 With CP 05000546 & 547
Midland 1 Consumers Power Company S of City of Midland, MI	PWR 492	1986 With CP 05000329
Midland 2 Consumers Power Company S of City of Midland, MI	PWR 818	1986 With CP 05000330
Montague 1 & 2 Northeast Nuclear Energy Company 1.2 miles SSE of Turners Falls, MA	BWR 1,150	1980 Under CP Review 05000496 & 497
New England 1 & 2 New England Power Company 8.5 miles E of Westerly, RI	PWR 1,194	1979 Under CP Review 05000568 & 569
New Haven 1 & 2 New York State Electric & Gas Corporation 3 miles NW of New Haven, NY	PWR 1,250	1980 Under CP Review 05000596 & 597
North Anna 3 Virginia Electric & Power Company 40 miles NW of Richmond, VA	PWR 907	1982 With CP 05000404
North Anna 4 Virginia Electric & Power Company 40 miles NW of Richmond, VA	PWR 907	1980 With CP 05000405
North Coast 1 Puerto Rico Water Resources Authority 4.7 miles ESE of Salinas, PR	PWR 583	1978 Under CP Review 05000376
Palo Verde 4 & 5 Arizona Public Service Company 36 miles W of Phoenix, AZ	PWR 1,270	1979 Under CP Review 05000592 & 593
Pebble Springs 1 & 2 Portland General Electric Company 55 miles WSW of Tri-Cities (Kenewick-Pasco-Richland, WA), OR	PWR 1,260	1982 Under CP Review 05000514 & 515

## APPENDIX D

## Cancelled U.S. Commercial Nuclear Power Reactors

## Part 50—Domestic Licensing of Production and Utilization Facilities (continued)

Unit Utility Location	Con Type MWe per Unit	Cancelled Date Status Docket Number
Perkins 1, 2, & 3 Duke Power Company 10 miles N of Salisbury, NC	PWR 1,280	1982 Under CP Review 05000488 & 489 & 490
Perry 2 Cleveland Electric Illuminating Co. 35 miles NE of Cleveland, OH	BWR 1,205	1994 Under CP Review 05000441
Phipps Bend 1 & 2 Tennessee Valley Authority 15 miles SW of Kingsport, TN	BWR 1,220	1982 With CP 05000553 & 554
Pilgrim 2 Boston Edison Company 4 miles SE of Plymouth, MA	PWR 1,180	1981 Under CP Review 05000471
Pilgrim 3 Boston Edison Company 4 miles SE of Plymouth, MA	PWR 1,180	1974 Under CP Review 05000472
Quanicassee 1 & 2 Consumers Power Company 6 miles E of Essexville, MI	PWR 1,150	1974 Under CP Review 05000475 & 476
River Bend 2 Gulf States Utilities Company 24 miles NNW of Baton Rouge, LA	BWR 934	1984 With CP 05000459
Seabrook 2 Public Service Co. of New Hampshire 13 miles S of Portsmouth, NH	PWR 1,198	1988 With CP 05000444
Shearon Harris 2 Carolina Power & Light Company 20 miles SW of Raleigh, NC	PWR 900	1983 With CP 05000401
Shearon Harris 3 & 4 Carolina Power & Light Company 20 miles SW of Raleigh, NC	PWR 900	1981 With CP 05000402 & 403
Skagit/Hanford 1 & 2 Puget Sound Power & Light Company 23 miles SE of Bellingham, WA	PWR 1,277	1983 Under CP Review 05000522 & 523
Sterling Rochester Gas & Electric Corporation 50 miles E of Rochester, NY	PWR 1,150	1980 With CP 05000485
Summit 1 & 2 Delmarva Power & Light Company 15 miles SSW of Wilmington, DE	HTG 1,200	1975 Under CP Review 05000450 & 451

## APPENDIX D

### Cancelled U.S. Commercial Nuclear Power Reactors

#### Part 50—Domestic Licensing of Production and Utilization Facilities (continued)

Unit Utility Location	Con Type MWe per Unit	Cancelled Date Status Docket Number
Sundesert 1 & 2 San Diego Gas & Electric Company 16 miles SW of Blythe, CA	PWR 974	1978 Under CP Review 05000582 & 583
Surry 3 & 4 Virginia Electric & Power Company 17 miles NW of Newport News, VA	PWR 882	1977 With CP 05000434 & 435
Tyrone 1 Northern States Power Company 8 miles NE of Durond, WI	PWR 1,150	1981 Under CP Review 05000484
Tyrone 2 Northern States Power Company 8 miles NE of Durond, WI	PWR 1,150	1974 With CP 05000487
Vogtle 3 & 4 Georgia Power Company 26 miles SE of Augusta, GA	PWR 1,113	1974 With CP 050000426 & 427
Washington Nuclear 1 (WPPSS) Energy Northwest 10 miles E of Aberdeen, WA	PWR 1,266	1995 With CP 05000460
Washington Nuclear 3 (WPPSS) Energy Northwest 16 miles E of Aberdeen, WA	PWR 1,242	1995 With CP 05000508
Washington Nuclear 4 (WPPSS) Energy Northwest 10 miles E of Aberdeen, WA	PWR 1,218	1982 With CP 05000513
Washington Nuclear 5 (WPPSS) Energy Northwest 16 miles E of Aberdeen, WA	PWR 1,242	1982 With CP 05000509
Yellow Creek 1 & 2 Tennessee Valley Authority 15 miles E of Corinth, MS	BWR 1,285	1984 With CP 05000566 & 567
Zimmer 1 Cincinnati Gas & Electric Company 25 miles SE of Cincinnati, OH	BWR 810	1984 With CP 05000358

Note: Cancellation is defined as public announcement of cancellation or written notification to the NRC. Only NRC-docketed applications are included. Status is the status of the application at the time of cancellation.

Source: DOE/EIA Commercial Nuclear Power 1991 (DOE/EIA-0438), Appendix E (page 105), and the NRC

**APPENDIX D**

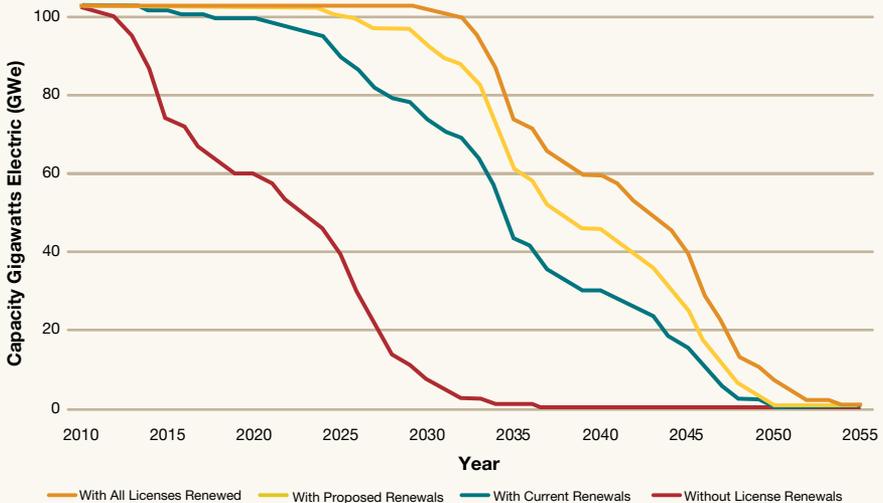
**Cancelled U.S. Commercial Nuclear Power Reactors**  
**Part 52— Licenses Certifications, and Approvals for Nuclear Power Plants**

Unit Utility Location	Con Type MWe per Unit	Cancelled Date Status Docket Number
Calvert Cliffs, Unit 3 LLC and UniStar Nuclear Operating Services, LLC Near Lusby in Calvert County, Maryland	U.S. EPR 4,500	July 17, 2015 Withdrawn during COL Review 05200016
Victoria County Station, Units 1 and 2 Exelon Nuclear Texas Holdings, LLC near Victoria City in Victoria County, Texas	ESBWR 4,500	June 11, 2010 Withdrawn during COL Review 05200031 & 05200032
Grand Gulf, Unit 3 Entergy Operations, Inc. (EOI) near Port Gibson in Claiborne County, Mississippi	ESBWR 4,500	January 9, 2009 Withdrawn during COL Review 05200024
Nine Mile Point, Unit 3 LLC and UniStar Nuclear Operating Services, LLC 25 miles SE of Cincinnati, OH	ESBWR 4,500	January 9, 2009 Withdrawn during COL Review 05000358

Note: Data is as of June 2015. Withdrawal was requested for Calvert Cliffs, Grand Gulf, Nine Mile Point, and Victoria County (COL and ESP). NRC-abbreviated reactor names listed

**APPENDIX E**

**Projected Electric Capacity Dependent on License Renewals**



## APPENDIX F

### U.S. Commercial Nuclear Power Reactors by Parent Company

Utility	NRC-Abbreviated Reactor Unit Name
AmerenUE <a href="http://www.ameren.com">www.ameren.com</a>	Callaway*
Arizona Public Service Company <a href="http://www.aps.com">www.aps.com</a>	Palo Verde 1, 2, & 3*
DTE Electric Company (DTE) <a href="http://www.dteenergy.com">www.dteenergy.com</a>	Fermi 2
Dominion Generation <a href="http://www.dom.com">www.dom.com</a>	Millstone 2 & 3 North Anna 1 & 2 Surry 1 & 2
Duke Energy <a href="http://www.duke-energy.com">www.duke-energy.com</a>	Brunswick 1 & 2 Catawba 1 & 2 Harris 1 McGuire 1 & 2 Oconee 1, 2, & 3 Robinson 2
Energy Northwest <a href="http://www.energy-northwest.com">www.energy-northwest.com</a>	Columbia
Entergy Nuclear Operations, Inc. <a href="http://www.entropy-nuclear.com">www.entropy-nuclear.com</a>	Arkansas Nuclear One 1 & 2 FitzPatrick Grand Gulf 1 Indian Point 2 & 3 Palisades Pilgrim 1 River Bend 1 Waterford 3
Exelon Corporation, LLC <a href="http://www.exeloncorp.com">www.exeloncorp.com</a>	Braidwood 1 & 2 Byron 1 & 2 Calvert Cliffs 1 & 2 Clinton Dresden 2 & 3 Ginna LaSalle 1 & 2 Limerick 1 & 2 Nine Mile Point 1 & 2 Oyster Creek Peach Bottom 2 & 3 Quad Cities 1 & 2 Three Mile Island 1
First Energy Nuclear Operating Company <a href="http://www.firstenergycorp.com">www.firstenergycorp.com</a>	Beaver Valley 1 & 2 Davis-Besse Perry 1

## APPENDIX F

U.S. Commercial Nuclear Power Reactors by Parent Company  
(continued)

Utility	NRC-Abbreviated Reactor Unit Name
NextEra Energy, Inc. with principal subsidiaries Florida Power & Light Co. and NextEra Energy Resources, LLC <a href="http://www.fplgroup.com">www.fplgroup.com</a>	Duane Arnold Point Beach 1 & 2 Seabrook 1 St. Lucie 1 & 2 Turkey Point 3 & 4
Indiana Michigan Power Company <a href="http://www.indianamichiganpower.com">www.indianamichiganpower.com</a>	Cook 1 & 2
Luminant Generation Company, LLC <a href="http://www.luminant.com">www.luminant.com</a>	Comanche Peak 1 & 2*
Nebraska Public Power District <a href="http://www.nppd.com">www.nppd.com</a>	Cooper
Northern States Power Company Minnesota doing business as Xcel Energy <a href="http://www.xcelenergy.com">www.xcelenergy.com</a>	Monticello Prairie Island 1 & 2
Omaha Public Power District <a href="http://www.oppd.com">www.oppd.com</a>	Fort Calhoun
Pacific Gas & Electric Company <a href="http://www.pge.com">www.pge.com</a>	Diablo Canyon 1 & 2*
PPL Susquehanna, LLC <a href="http://www.pplweb.com">www.pplweb.com</a>	Susquehanna 1 & 2
PSEG Nuclear, LLC <a href="http://www.pseg.com">www.pseg.com</a>	Hope Creek 1 Salem 1 & 2
South Carolina Electric & Gas Company <a href="http://www.sceg.com">www.sceg.com</a>	Summer
Southern Nuclear Operating Company <a href="http://www.southerncompany.com">www.southerncompany.com</a>	Hatch 1 & 2 Farley 1 & 2 Vogtle 1 & 2
STP Nuclear Operating Company <a href="http://www.stpnoc.com">www.stpnoc.com</a>	South Texas Project 1 & 2*
Tennessee Valley Authority <a href="http://www.tva.gov">www.tva.gov</a>	Browns Ferry 1, 2, & 3 Sequoyah 1 & 2 Watts Bar 1
Wolf Creek Nuclear Operating Corporation <a href="http://www.wcnoc.com">www.wcnoc.com</a>	Wolf Creek 1*

\* These plants have a joint program called the Strategic Teaming and Resource Sharing (STARS) group. They share resources for refueling outages and develop some shared licensing applications.

## APPENDIX G

### U.S. Commercial Nuclear Power Reactor Operating Licenses— Issued by Year

<b>1969</b> Dresden 2 Ginna Nine Mile Point 1 Oyster Creek	Calvert Cliffs 1 Cooper Cook 1 Duane Arnold FitzPatrick Hatch 1 Oconee 3 Peach Bottom 3 Prairie Island 1 Prairie Island 2 Three Mile Island 1	<b>1980</b> North Anna 2 Sequoyah 1	<b>1986</b> Catawba 2 Hope Creek 1 Millstone 3 Palo Verde 2 Perry 1
<b>1970</b> Point Beach 1 Robinson 2	<b>1975</b> Millstone 2	<b>1981</b> Farley 2 McGuire 1 Salem 2 Sequoyah 2	<b>1987</b> Beaver Valley 2 Braidwood 1 Byron 2 Clinton Harris 1 Nine Mile Point 2 Palo Verde 3 Vogtle 1
<b>1971</b> Dresden 3 Monticello	<b>1976</b> Beaver Valley 1 Browns Ferry 3 Brunswick 1 Calvert Cliffs 2 Indian Point 3 Salem 1 St. Lucie 1	<b>1982</b> LaSalle 1 Summer Susquehanna 1	<b>1988</b> Braidwood 2 South Texas Project 1
<b>1972</b> Palisades Pilgrim Quad Cities 1 Quad Cities 2 Surry 1 Turkey Point 3	<b>1977</b> Davis-Besse D.C. Cook 2 Farley 1	<b>1983</b> McGuire 2 St. Lucie 2	<b>1989</b> Limerick 2 South Texas Project 2 Vogtle 2
<b>1973</b> Browns Ferry 1 Fort Calhoun Indian Point 2 Oconee 1 Oconee 2 Peach Bottom 2 Point Beach 2 Surry 2 Turkey Point 4	<b>1978</b> Arkansas Nuclear 2 Hatch 2 North Anna 1	<b>1984</b> Callaway Columbia Diablo Canyon 1 Grand Gulf 1 LaSalle 2 Susquehanna 2	<b>1990</b> Comanche Peak 1 Seabrook 1
<b>1974</b> Arkansas Nuclear 1 Browns Ferry 2 Brunswick 2		<b>1985</b> Byron 1 Catawba 1 Diablo Canyon 2 Fermi 2 Limerick 1 Palo Verde 1 River Bend 1 Waterford 3 Wolf Creek 1	<b>1993</b> Comanche Peak 2 <b>1996</b> Watts Bar 1

Note: List is limited to reactors licensed to operate. Year is based on the date the initial full-power operating license was issued. NRC-abbreviated reactor names are listed.

## APPENDIX H

### U.S. Commercial Nuclear Power Reactor Operating Licenses— Expiration by Year, 2013–2049

<b>2013</b> Indian Point 2 <b>2015</b> Indian Point 3 <b>2017</b> Davis-Besse <b>2020</b> Sequoyah 1 <b>2021</b> Sequoyah 2 <b>2022</b> LaSalle 1 <b>2023</b> LaSalle 2 <b>2024</b> Byron 1 Diablo Canyon 1 Grand Gulf 1 Limerick 1 Waterford 3	<b>2030</b> Comanche Peak 1 Monticello Point Beach 1 Robinson 2 Seabrook	Calvert Cliffs 1 Cook 1 Cooper Duane Arnold Hatch 1 FitzPatrick Oconee 3 Peach Bottom 3 Prairie Island 2 Three Mile Island 1	<b>2041</b> Farley 2 McGuire 1
<b>2025</b> Diablo Canyon 2 Fermi 2 River Bend 1	<b>2031</b> Dresden 3 Palisades	<b>2035</b> Millstone 2 Watts Bar 1	<b>2042</b> Summer Susquehanna 1
<b>2026</b> Braidwood 1 Byron 2 Clinton Perry	<b>2032</b> Pilgrim Quad Cities 1 Quad Cities 2 Surry 1 Turkey Point 3	<b>2036</b> Beaver Valley 1 Browns Ferry 3 Brunswick 1 Calvert Cliffs 2 St. Lucie 1 Salem 1	<b>2043</b> Catawba 1 Catawba 2 Columbia McGuire 2 St. Lucie 2
<b>2027</b> Braidwood 2 South Texas Project 1	<b>2033</b> Browns Ferry 1 Comanche Peak 2 Fort Calhoun Oconee 1 Oconee 2 Peach Bottom 2 Point Beach 2 Prairie Island 1 Surry 2	<b>2037</b> Cook 2 Farley 1	<b>2044</b> Susquehanna 2 Callaway Millstone 3 Palo Verde 1 Wolf Creek 1
<b>2028</b> South Texas Project 2	Turkey Point 4	<b>2038</b> Arkansas Nuclear 2 Hatch 2	<b>2045</b> Nine Mile Point 2 Harris 1 Hope Creek Palo Verde 2
<b>2029</b> Dresden 2 Ginna Limerick 2 Nine Mile Point 1 Oyster Creek	<b>2034</b> Arkansas Nuclear 1 Browns Ferry 2 Brunswick 2	<b>2039</b> North Anna 1 North Anna 2 Salem 2	<b>2046</b> Beaver Valley 2 Palo Verde 3 Vogtle 1
			<b>2047</b> Beaver Valley 2 Palo Verde 3 Vogtle 1
			<b>2049</b> Vogtle 2

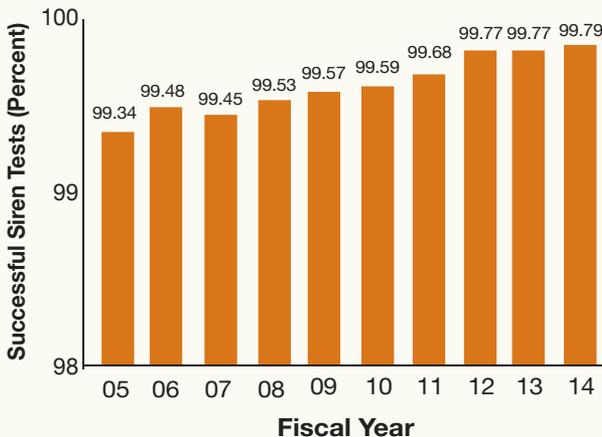
Note: This includes Indian Point 2, which entered timely renewal on Sept. 29, 2013. Limited to reactors licensed to operate. NRC-abbreviated reactor names listed. Data are as of June 2015.

## APPENDIX I

### Industry Performance Indicators: Industry Averages, FYs 2005–2014

Indicator	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Alert and Notification	99.34	99.48	99.45	99.53	99.57	99.59	99.68	99.77	99.77	99.79
Automatic Scrams	0.47	0.32	0.48	0.29	0.36	0.44	0.45	0.30	0.38	0.39
Collective Radiation Exposure	117	93	109	96	87	91	90	72	77	72
Drill/Exercise Performance	95.82	96.06	96.19	96.22	97.06	96.89	97.30	97.51	97.47	97.86
Equipment-Forced Outage Rate	0.13	0.10	0.11	0.08	0.09	0.10	0.09	0.09	0.08	0.10
ERO Drill Participation	98.20	97.89	97.55	98.16	98.65	98.77	99.43	99.33	99.46	99.71
Forced Outage Rate	2.34	1.47	1.41	1.34	2.21	1.74	1.80	2.77	2.98	1.27
Safety System Actuations	0.38	0.22	0.25	0.14	0.23	0.18	0.19	0.17	0.29	0.20
Safety System Failures	0.98	0.60	0.68	0.71	0.71	0.93	0.94	0.87	0.92	0.87
Significant Events	0.05	0.03	0.02	0.03	0.02	0.10	0.13	0.10	0.07	0.01

### Alert and Notification System (ANS) Reliability



*This figure shows the percentage of ANS sirens that successfully operated during periodic tests in the previous year. The result is an indicator of the reliability of the ANS to alert the public in an emergency.*

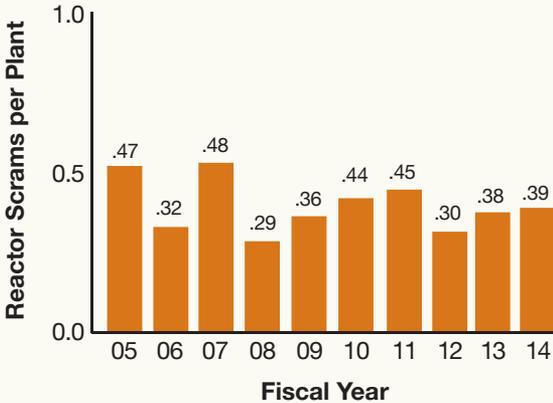
Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC

## APPENDIX I

### Industry Performance Indicators: Industry Averages, FYs 2005–2014 (continued)

#### Automatic Scrams While Critical

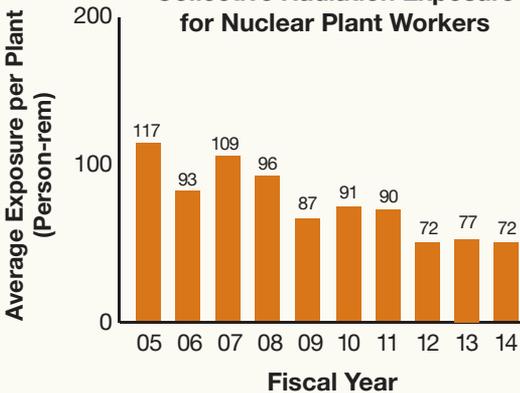


*A reactor is considered “critical” when it achieves a self-sustaining nuclear chain reaction, such as when the reactor is operating. The sudden shutting down of a nuclear reactor by the rapid insertion of control rods, either automatically or manually by the reactor operator, is referred to as a “scram.” This indicator measures the number of unplanned automatic scrams that occurred while the reactor was critical.*

Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC

#### Collective Radiation Exposure for Nuclear Plant Workers



*This indicator monitors the total radiation dose accumulated by plant personnel.*

#### Further Explanation:

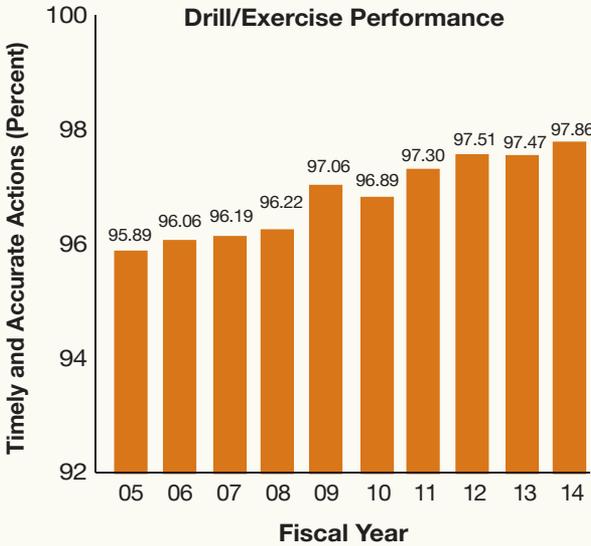
In 2014, those workers receiving a measurable dose of radiation received an average of about 0.1 rem. For comparison purposes, the average U.S. citizen receives 0.3 rem of radiation each year from natural sources (i.e., the everyday environment). See the definition of “exposure” in the Glossary.

Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC

APPENDIX I

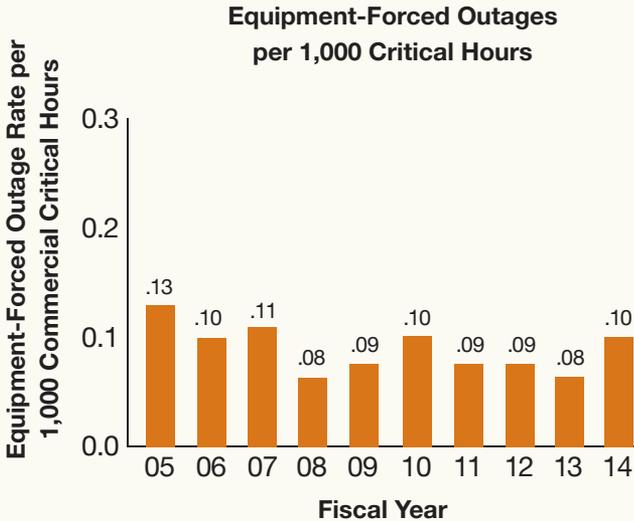
Industry Performance Indicators:  
Industry Averages, FYs 2005–2014 (continued)



*This indicator is the percentage of timely and accurate actions taken by plant personnel (emergency classifications, protective action recommendations, and notification to offsite authorities) in drills and actual events during the previous 2 years.*

Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC



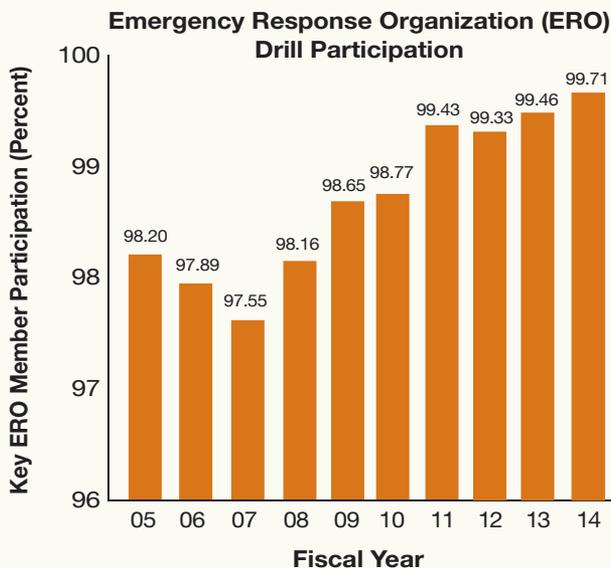
*This indicator is the number of times the plant is forced to shut down because of equipment failures for every 1,000 hours that the plant is in operation and transmitting electricity.*

Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC

## APPENDIX I

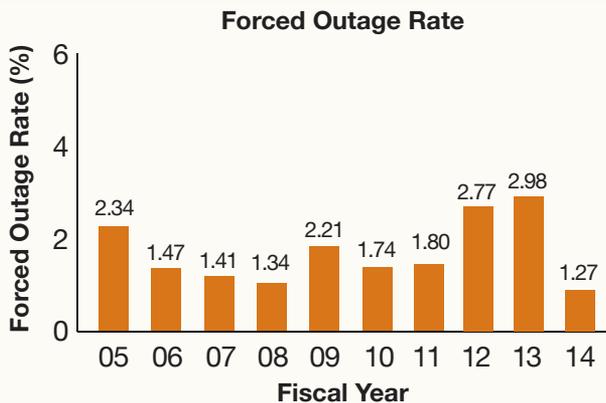
### Industry Performance Indicators: Industry Averages, FYs 2005–2014 (continued)



*This indicator is the percentage of participation by key plant personnel in drills or actual events in the previous 2 years, indicating proficiency and readiness to respond to emergencies.*

Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC



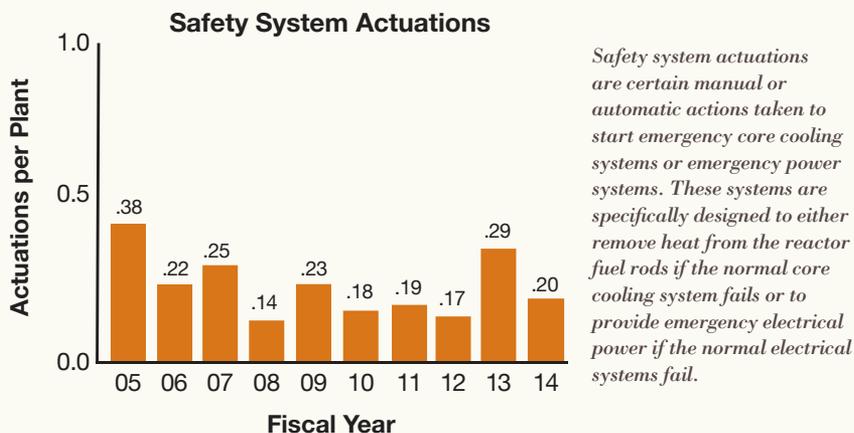
*The forced outage rate is the number of hours that the plant is unable to operate (forced outage hours) divided by the sum of the hours that the plant is generating and transmitting electricity (unit service hours) and the hours that the plant is unable to operate (forced outage hours).*

Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC

## APPENDIX I

**Industry Performance Indicators:  
Industry Averages, FYs 2005–2014 (continued)**



Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC

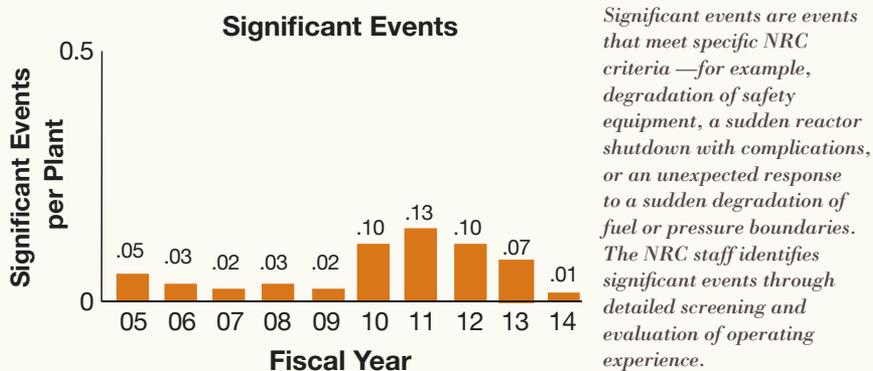


Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC

## APPENDIX I

### Industry Performance Indicators: Industry Averages, FYs 2005–2014 (continued)



Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC

**APPENDIX J**  
**Operating U.S. Nuclear Research and Test Reactors**  
**Regulated by the NRC**

<b>Licensee Location</b>	<b>Reactor Type OL Issued</b>	<b>Power Level (kW)</b>	<b>Licensee Number Docket Number</b>
Aerotest* San Ramon, CA	TRIGA (Indus) 07/02/1965	250	R-98 05000228
Armed Forces Radiobiology Research Institute Bethesda, MD	TRIGA 06/26/1962	1,100	R-84 05000170
Dow Chemical Company Midland, MI	TRIGA 07/03/1967	300	R-108 05000264
GE-Hitachi Sunol, CA	Tank 10/31/1957	100	R-33 05000073
Idaho State University Pocatello, ID	AGN-201 #103 10/11/1967	0.005	R-110 05000284
Kansas State University Manhattan, KS	TRIGA 10/16/1962	250	R-88 05000188
Massachusetts Institute of Technology Cambridge, MA	HWR Reflected 06/09/1958	6,000	R-37 05000020
Missouri University of Science and Technology Rolla, MO	Pool 11/21/1961	200	R-79 05000123
National Institute of Standards & Technology Gaithersburg, MD	Nuclear Test 05/21/1970	20,000	TR-5 05000184
North Carolina State University Raleigh, NC	Pulstar 08/25/1972	1,000	R-120 05000297
Ohio State University Columbus, OH	Pool 02/24/1961	500	R-75 05000150
Oregon State University Corvallis, OR	TRIGA Mark II 03/07/1967	1,100	R-106 05000243
Pennsylvania State University State College, PA	TRIGA 07/08/1955	1,100	R-2 05000005
Purdue University West Lafayette, IN	Lockheed 08/16/1962	1	R-87 05000182
Reed College Portland, OR	TRIGA Mark I 07/02/1968	250	R-112 05000288

\* Permanent shutdown ordered July 24, 2013.

**APPENDIX J**  
**Operating U.S. Nuclear Research and Test Reactors**  
**Regulated by the NRC (continued)**

<b>Licensee Location</b>	<b>Reactor Type OL Issued</b>	<b>Power Level (kW)</b>	<b>Licensee Number Docket Number</b>
Rensselaer Polytechnic Institute Troy, NY	Critical Assembly 07/03/1964	0.1	CX-22 05000225
Rhode Island Atomic Energy Commission Narragansett, RI	GE Pool 07/23/1964	2,000	R-95 05000193
Texas A&M University College Station, TX	AGN-201M #106 08/26/1957	0.005	R-23 05000059
Texas A&M University College Station, TX	TRIGA 12/07/1961	1,000	R-83 05000128
U.S. Geological Survey Denver, CO	TRIGA Mark I 02/24/1969	1,000	R-113 05000274
University of California/Davis Sacramento, CA	TRIGA 08/13/1998	2,300	R-130 05000607
University of California/Irvine Irvine, CA	TRIGA Mark I 11/24/1969	250	R-116 05000326
University of Florida Gainesville, FL	Argonaut 05/21/1959	100	R-56 05000083
University of Maryland College Park, MD	TRIGA 10/14/1960	250	R-70 05000166
University of Massachusetts/Lowell Lowell, MA	GE Pool 12/24/1974	1,000	R-125 05000223
University of Missouri/Columbia Columbia, MO	Tank 10/11/1966	10,000	R-103 05000186
University of New Mexico Albuquerque, NM	AGN-201M #112 09/17/1966	0.005	R-102 05000252
University of Texas Austin, TX	TRIGA Mark II 01/17/1992	1,100	R-129 05000602
University of Utah Salt Lake City, UT	TRIGA Mark I 09/30/1975	100	R-126 05000407
University of Wisconsin Madison, WI	TRIGA 11/23/1960	1,000	R-74 05000156
Washington State University Pullman, WA	TRIGA 03/06/1961	1,000	R-76 05000027

## APPENDIX K

**U.S. Nuclear Research and Test Reactors  
under Decommissioning Regulated by the NRC**

<b>Licensee Location</b>	<b>Reactor Type Power Level (kW)</b>	<b>OL Issued Shutdown</b>	<b>Decommissioning Alternative Selected Current Status</b>
General Atomics San Diego, CA	TRIGA Mark F 1,500	07/01/60 09/07/94	DECON SAFSTOR
General Atomics San Diego, CA	TRIGA Mark I 250	05/03/58 12/17/96	DECON SAFSTOR
General Electric Company Sunol, CA	GETR (Tank) 50,000	01/07/59 06/26/85	SAFSTOR SAFSTOR
University of Buffalo Buffalo, NY	Pulstar 2,000	03/24/61 07/23/96	DECON DECON In Progress
Veterans Administration Omaha, NE	TRIGA 20	06/26/59 11/05/01	DECON SAFSTOR

## APPENDIX L

### U.S. Materials Licenses by State

State	Number of Licenses	
	NRC	Agreement States
Alabama	16	425
Alaska	69	0
Arizona	10	358
Arkansas	9	192
California	72	1,789
Colorado	17	335
Connecticut	157	0
Delaware	49	0
District of Columbia	37	0
Florida	25	1,648
Georgia	24	465
Hawaii	55	0
Idaho	71	0
Illinois	31	647
Indiana	252	0
Iowa	2	162
Kansas	15	280
Kentucky	12	388
Louisiana	11	509
Maine	3	111
Maryland	85	539
Massachusetts	35	444
Michigan	466	0
Minnesota	15	166
Mississippi	9	307
Missouri	256	0
Montana	86	0
Nebraska	10	145
Nevada	2	244
New Hampshire	8	80
New Jersey	37	637

State	Number of Licenses	
	NRC	Agreement States
New Mexico	11	202
New York	28	1,341
North Carolina	24	615
North Dakota	6	102
Ohio	44	610
Oklahoma	19	224
Oregon	6	396
Pennsylvania	50	665
Rhode Island	1	43
South Carolina	15	396
South Dakota	39	0
Tennessee	25	553
Texas	49	1,571
Utah	10	185
Vermont	33	0
Virginia	61	401
Washington	17	357
West Virginia	172	0
Wisconsin	11	305
Wyoming	88	0
Puerto Rico	131	0
Virgin Islands	9	0
Guam	5	0

Total number of materials licenses in Agreement State jurisdiction	17,837
Total number of materials licenses in NRC jurisdiction	2,800
Total number of materials licenses in the United States	20,637

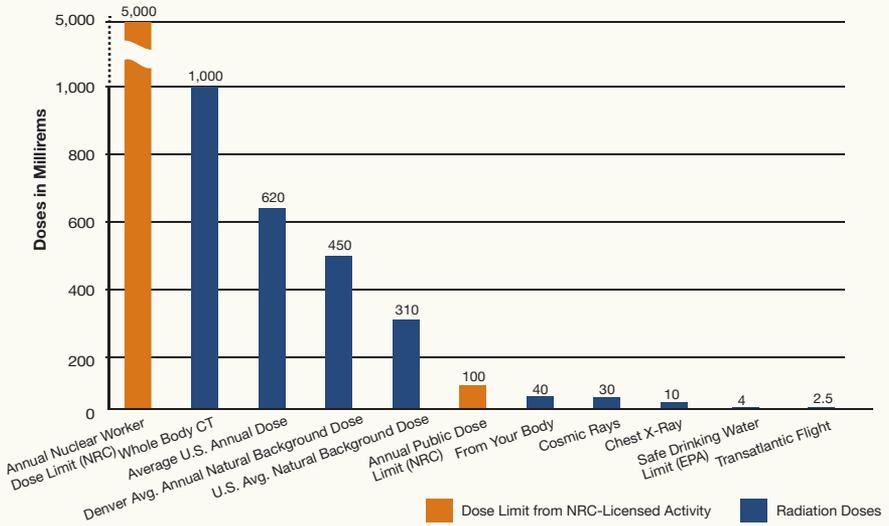
Agreement State
  Letter of intent

\* Others include major U.S. territories.

Note: The NRC and Agreement State data is as of November 2014. These totals represent an estimate because the number of specific radioactive materials licenses per State may change on a daily basis.

The NRC licenses Federal agencies in Agreement States.

## APPENDIX M Radiation Doses and Regulatory Limits



## APPENDIX N

### Major U.S. Fuel Cycle Facility Sites

Licensee	Location	Status	Docket #
<b>Uranium Hexafluoride Conversion Facility</b>			
Honeywell International, Inc.	Metropolis, IL	active	04003392
<b>Uranium Fuel Fabrication Facilities</b>			
Global Nuclear Fuel-Americas, LLC	Wilmington, NC	active	07001139
Westinghouse Electric Company, LLC Columbia Fuel Fabrication Facility	Columbia, SC	active	07109239
Nuclear Fuel Services, Inc.	Erwin, TN	active	07000143
Babcock & Wilcox Nuclear Operations Group	Lynchburg, VA	active	07000027
AREVA NP, Inc.	Richland, WA	active	07001257
<b>Mixed Oxide Fuel Fabrication Facility</b>			
Shaw AREVA MOX Services, LLC	Aiken, SC	under construction (operating license under review)	07003098
<b>Gaseous Diffusion Uranium Enrichment Facilities</b>			
USEC, United States Enrichment Corp. Paducah Gaseous Diffusion Plant	Paducah, KY	shut down, certificate termination pending	07007001
<b>Gas Centrifuge Uranium Enrichment Facilities</b>			
USEC, American Centrifuge Operating, LLC Lead Cascade: Test and Demonstration Facility	Piketon, OH	active	07007003
USEC, American Centrifuge Operating, LLC American Centrifuge Plant	Piketon, OH	license issued, construction halted	07007004
Louisiana Energy Services (URENCO-USA)	Eunice, NM	active*	07003103
AREVA Enrichment Services, LLC Eagle Rock Enrichment Facilities	Idaho Falls, ID	license issued, construction not started	07007015
<b>Laser Separation Enrichment Facility</b>			
GE-Hitachi	Wilmington, NC	license issued, construction not started	07007016
<b>Uranium Hexafluoride Deconversion Facility</b>			
International Isotopes	Hobbs, NM (Lea County)	license issued, construction not started	04009086

\* Operating and producing enriched uranium while undergoing further phases of construction.

Note: The NRC regulates eleven other university and research facilities that possess special nuclear material (other than reactors) or process source material (other than uranium-recovery facilities) licensed under 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material."

Data are as of May 2015.

**APPENDIX O**  
**Dry Spent Fuel Storage Designs:**  
**NRC-Approved for Use by General Licensees**

<b>Vendor</b>	<b>Docket #</b>	<b>Storage Design Model</b>
General Nuclear Systems, Inc.	07201000	CASTOR V/21
		CASTOR X/33
NAC International, Inc.	07201002	NAC S/T
	07201003	NAC-C28 S/T
	07201015	NAC-UMS
	07201025	NAC-MPC
	07201031	Magnastor
	07201013	NAC-STC
Holtec International	07201008	HI-STAR 100
	07201014	HI-STORM 100
	07201032	HI-STORM FW
	07201040	HI-STORM UMAX
Energy Solutions, Inc.	07201007	VSC-24
	07201026	Fuel Solutions™ (WSNF-220, -221, -223)
		W-150 Storage Cask
		W-100 Transfer Cask
W-21, W-74 Canisters		
Transnuclear, Inc.	07201005	TN-24
	07201027	TN-68
	07201021	TN-32, 32A, 32B
	07201004	Standardized NUHOMS®-24P, -24PHB, -24PTH, -32PT, -32PTH1, -37PTH, -52B, -61BT, -61BTH, -69BTH
		Standardized Advanced NUHOMS®-24PT1, -24PT4
		NUHOMS® HD-32PTH
	07201029	NUHOMS®-7P
	07201030	
07201022		

Data are as of May 2015. (See latest list on the NRC Web site at [www.nrc.gov/waste/spent-fuel-storage/designs.html](http://www.nrc.gov/waste/spent-fuel-storage/designs.html).)

## APPENDIX P

### Dry Cask Spent Fuel Storage Licensees

Name Licensee	License Type	Vendor	Storage Model	Docket Number
Arkansas Nuclear Entergy Nuclear Operations, Inc.	GL	Energy Solutions, Inc. Holtec International	VSC-24 HI-STORM 100	07200013
Beaver Valley	GL	Transnuclear, Inc	NUHOMS®-37PTH	07201043
Big Rock Point Entergy Nuclear Operations, Inc.	GL	Energy Solutions, Inc.	Fuel Solutions™ W74	07200043
Braidwood Exelon Generation Co., LLC	GL	Holtec International	HI-STORM 100	07200073
Browns Ferry Tennessee Valley Authority	GL	Holtec International	HI-STORM 100S	07200052
Brunswick Carolina Power Co.	GL	Transnuclear, Inc.	NUHOMS®-HD-61BTH	07200006
Byron Exelon Generation Co., LLC	GL	Holtec International	HI-STORM 100	07200068
Callaway	GL	Holtec International	HI-STORM UMAX	07201045
Calvert Cliffs Calvert Cliffs Nuclear Power Plant, Inc.	SL	Transnuclear, Inc.	NUHOMS®-24P NUHOMS®-32P	07200008
Catawba Duke Energy Carolinas, LLC	GL	NAC International, Inc.	NAC-UMS	07200045
Columbia Generating Station Energy Northwest	GL	Holtec International	HI-STORM 100	07200035
Comanche Peak Luminant Generation Company, LLC	GL	Holtec International	HI-STORM 100	07200074
Cook Indiana/Michigan Power	GL	Holtec International	HI-STORM	07200072
Cooper Nuclear Station Nebraska Public Power District	GL	Transnuclear, Inc.	NUHOMS®-61BT	07200066
Davis-Besse FirstEnergy Nuclear Operating Company	GL	Transnuclear, Inc.	NUHOMS®-24P	07200014
Diablo Canyon Pacific Gas & Electric Co.	SL	Holtec International	HI-STORM 100	07200026
Dresden Exelon Generation Company, LLC	GL	Holtec International	HI-STAR 100 HI-STORM 100	07200037
Duane Arnold Next Era Energy Duane Arnold, LLC.	GL	Transnuclear, Inc.	NUHOMS®-61BT	07200032
Fermi	GL	Holtec International	HI-STORM 100	07200071

**APPENDIX P**  
**Dry Cask Spent Fuel Storage Licensees (continued)**

<b>Name Licensee</b>	<b>License Type</b>	<b>Vendor</b>	<b>Storage Model</b>	<b>Docket Number</b>
Fort Calhoun Omaha Public Power District	GL	Transnuclear, Inc.	NUHOMS®-32PT	07200054
Fort St. Vrain* U.S. Department of Energy	SL	FW Energy Applications, Inc.	Modular Vault Dry Store	07200009
Ginna Constellation Energy	GL	Transnuclear, Inc.	NUHOMS®-32PT	07200067
Grand Gulf Entergy Nuclear Operations, Inc.	GL	Holtec International	HI-STORM 100S	07200050
H.B. Robinson Carolina Power & Light Company	SL GL	Transnuclear, Inc. Transnuclear, Inc.	NUHOMS®-7P NUHOMS®-24P	07200003 07200060
Haddam Neck CT Yankee Atomic Power	GL	NAC International, Inc.	NAC-MPC	07200039
Hatch Southern Nuclear Operating, Inc.	GL	Holtec International	HI-STAR 100 HI-STAR 100	07200036
Hope Creek/Salem PSEG Nuclear, LLC	GL	Holtec International	HI-STORM 100	07200048
Humboldt Bay Pacific Gas & Electric Co.	SL	Holtec International	HI-STORM 100HB	07200027
Idaho National Lab TMI-2 Fuel Debris, U.S. Department of Energy	SL	Transnuclear, Inc.	NUHOMS®-12T	07200020
Idaho Spent Fuel Facility Environmental Corp.	SL	Foster Wheeler	Concrete Vault	07200025
Indian Point Entergy Nuclear Operations, Inc.	GL	Holtec International	HI-STORM 100	07200051
James A. FitzPatrick Entergy Nuclear Operations, Inc.	GL	Holtec International	HI-STORM 100	07200012
Joseph M. Farley Southern Nuclear Operating Co.	GL	Transnuclear, Inc.	NUHOMS®-32PT	07200042
Kewaunee Northern States Power Co., Minnesota	GL	Transnuclear, Inc.	NUHOMS®-39PT	07200064
La Salle Exelon Generation Co., LLC	GL	Holtec International	HI-STORM100	07200070
Lacrosse Dairyland Power	GL	NAC International, Inc	NAC-MPC	07200046
Limerick Exelon Generation Co., LLC	GL	Transnuclear, Inc.	NUHOMS®-61BT	07200065

## APPENDIX P

### Dry Cask Spent Fuel Storage Licensees (continued)

Name Licensee	License Type	Vendor	Storage Model	Docket Number
Maine Yankee Maine Yankee Atomic Power Company	GL	NAC International, Inc.	NAC-UMS	07200030
McGuire Duke Energy, LLC	GL	Transnuclear, Inc.	TN-32	07200038
Millstone Dominion Generation	GL	Transnuclear, Inc.	NUHOMS®-32PT	07200047
Monticello Northern States Power Co., Minnesota	GL	Transnuclear, Inc.	NUHOMS®-61BT NUHOMS®-61BTH	07200058
Nine Mile Point Constellation Energy	GL	Transnuclear, Inc.	NUHOMS®-61BT	07201036
North Anna Virginia Electric & Power Company (Dominion Gen.)	SL GL	Transnuclear, Inc. Transnuclear, Inc.	TN-32 NUHOMS®HD32PTH	07200016 07200056
Oconee Duke Energy Company	SL GL	Transnuclear, Inc. Transnuclear, Inc.	NUHOMS®-24P NUHOMS®-24P	07200004 07200040
Oyster Creek AmerGen Energy Company, LLC.	GL	Transnuclear, Inc.	NUHOMS®-61BT	07200015
Palisades Energy Nuclear Operations, Inc.	GL	Energy Solutions, Inc.	VSC-24 NUHOMS®-32PT	07200007
Palo Verde Arizona Public Service Co.	GL	NAC International, Inc.	NAC-UMS	07200044
Peach Bottom Exelon Generation Company, LLC	GL	Transnuclear, Inc.	TN-68	07200029
Perry FirstEnergy	GL	Holtec International	HI-STORM	07200069
Pilgrim	GL	Holtec International	HI-STORM 100	07201044
Point Beach FLP Energy Point Beach, LLC	GL	Energy Solutions, Inc.	VSC-24 NUHOMS®-32PT	07200005
Prairie Island Northern States Power Co., Minnesota	SL	Transnuclear, Inc.	TN-40 HT TN-40	07200010
Private Fuel Storage Facility	SL	Holtec International	HI-STORM 100	07200022
Quad Cities Exelon Generation Company, LLC	GL	Holtec International	HI-STORM 100S	07200053
Rancho Seco Sacramento Municipal Utility District	SL	Transnuclear, Inc.	NUHOMS®-24P	07200011

**APPENDIX P**  
**Dry Cask Spent Fuel Storage Licensees (continued)**

<b>Name Licensee</b>	<b>License Type</b>	<b>Vendor</b>	<b>Storage Model</b>	<b>Docket Number</b>
River Bend Entergy Nuclear Operations, Inc.	GL	Holtec International	HI-STORM 100S	07200049
Salem PSEG Nuclear	GL	Holtec International	HI-STORM	07200048
San Onofre Southern California Edison Company	GL	Transnuclear, Inc.	NUHOMS®-24PT	07200041
Seabrook FPL Energy	GL	Transnuclear, Inc.	NUHOMS®-HD-32PTH	07200061
Sequoyah Tennessee Valley Authority	GL	Holtec International	HI-STORM 100	07200034
St. Lucie Florida Power and Light Company	GL	Transnuclear, Inc.	NUHOMS®-HD-32PTH	07200061
Surry Virginia Electric & Power Company (Dominion Gen.)	SL	General Nuclear Systems, Inc. Transnuclear, Inc. General Nuclear Westinghouse, Inc.	CASTOR V/21 TN-32 NAC-128 CASTOR X/33 MC-10	07200002
Susquehanna PPL Susquehanna, LLC	GL	Transnuclear, Inc.	NUHOMS®HD32PTH NUHOMS®-52B NUHOMS®-61BT NUHOMS®-61BTH	07200028
Trojan Portland General Electric Corp.	SL	Holtec International	HI-STORM 100	07200017
Turkey Point ISFSI Florida Power and Light Company	GL	Transnuclear, Inc.	NUHOMS®-HD-32PTH	07200062
Vermont Yankee Entergy Nuclear Operations, Inc.	GL	Holtec International	HI-STORM100	07200059
Vogtle Southern Company	GL	Holtec International	HI-STORM 100S	07201039
Waterford Steam Electric Station Entergy Nuclear Operations, Inc.	GL	Holtec International	HI-STORM 100	07200075
Yankee Rowe Yankee Atomic Electric	GL	NAC International, Inc.	NAC-MPC	07200031
Zion Zion Solutions, LLC	GL	NAC International, Inc.	Magnastor	07201037

\* Fort St. Vrain is undergoing decommissioning and was transferred to DOE on June 4, 1999.

Note: NRC-abbreviated unit names.

## APPENDIX Q

### U.S. Low-Level Radioactive Waste Disposal Compact Membership

#### Appalachian Compact

Delaware  
Maryland  
Pennsylvania  
West Virginia

#### Atlantic Compact

Connecticut  
New Jersey  
South Carolina\*

#### Central Compact

Arkansas  
Kansas  
Louisiana  
Oklahoma

#### Central Midwest Compact

Illinois  
Kentucky

#### Midwest Compact

Indiana  
Iowa  
Minnesota  
Missouri  
Ohio  
Wisconsin

#### Northwest Compact

Alaska  
Hawaii  
Idaho  
Montana  
Oregon  
Utah\*  
Washington\*  
Wyoming

#### Rocky Mountain Compact

Colorado  
Nevada  
New Mexico  
*(Northwest accepts Rocky Mountain waste as agreed between compacts)*

#### Southeast Compact

Alabama  
Florida  
Georgia  
Mississippi  
Tennessee  
Virginia

#### Southwestern Compact

Arizona  
California  
North Dakota  
South Dakota

#### Texas Compact

Texas\*  
Vermont

#### Unaffiliated

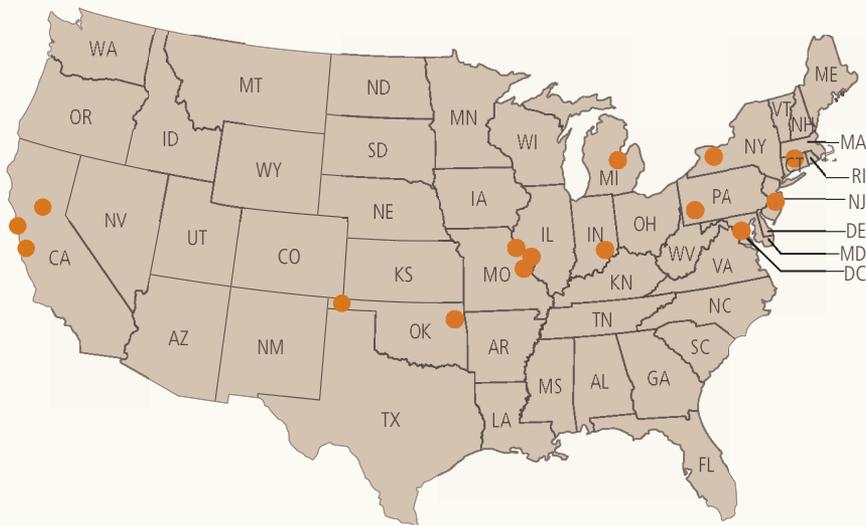
District of Columbia  
Maine  
Massachusetts  
Michigan  
Nebraska  
New Hampshire  
New York  
North Carolina  
Puerto Rico  
Rhode Island

### Closed Low-Level Waste Disposal Facility Sites Licensed by the NRC or Agreement States

Beatty, NV, closed 1993  
Sheffield, IL, closed 1978  
Maxey Flats, KY, closed 1977  
West Valley, NY, closed 1975

\* Site of an active LLW disposal facility.  
Note: Data are as of May 2015.

**APPENDIX R**  
**NRC-Regulated Complex Material Sites**  
**Undergoing Decommissioning**



● NRC-regulated complex material sites (15)

<b>Company</b>	<b>Location</b>
AAR Manufacturing, Inc. (Brooks & Perkins)	Livonia, MI
Alameda Naval Air Station	Alameda, CA
Army, Department of, Jefferson Proving Ground	Madison, IN
Babcock & Wilcox SLDA	Vandergrift, PA
Beltsville Agricultural Research Center	Beltsville, MD
FMRI	Muskogee, OK
Hunter's Point Naval Shipyard	San Francisco, CA
Cimarron Environmental Trust	Cimarron, OK
Mallinckrodt Chemical, Inc.	St. Louis, MO
McClellan Air Force Base	Sacramento, CA
Sigma Aldrich	Maryland Heights, MO
Stepan Chemical Corporation	Maywood, NJ
UNC Naval Products	New Haven, CT
West Valley Demonstration Project	West Valley, NY
Westinghouse Electric Corporation—Hematite	Festus, MO

Note: Data are as of May 2015.

Picatinny Arsenal in NJ managed by Region I is not considered "complex."

## APPENDIX S

### Nuclear Power Units by Nation

Country	Nuclear Power Production GWh*	In Operation		Under Construction or on Order		Shutdown
		Number of Units	Capacity Net MWe	Number of Units	Capacity Net MWe	
Argentina	5,257	3	1625	1	25	0
Armenia	2,266	1	376	0	0	1 <sup>P</sup>
Belarus	0	0	0	2	2,218	0
Belgium	33,093	7	5,927	0	0	1 <sup>P</sup>
Brazil	15,385	2	1,884	1	1,245	0
Bulgaria	15,014	2	1,926	0	0	4 <sup>P</sup>
Canada	100,921	19	13,500	0	0	6 <sup>P</sup>
China	130,580	27	23,025	24	23,738	0
Czech Republic	28,636	6	3,904	0	0	0
Finland	22,654	4	2,752	1	1,600	0
France	415,900	58	63,130	1	1,600	12 <sup>P</sup>
Germany	91,783	9	12,074	0	0	27 <sup>P</sup>
Hungary	14,778	4	1,889	0	0	0
India	33,231	21	5,308	6	3,990	0
Iran	4,140	1	915	0	0	0
Italy	0	0	0	0	0	4 <sup>P</sup>
Japan	0	43	40,290	2	2,650	11 <sup>P</sup> & 1 <sup>L</sup>
Kazakhstan	0	0	0	0	0	1 <sup>P</sup>
Rep. Korea	149,165	24	21,667	4	5,420	0
Lithuania	0	0	0	0	0	2 <sup>P</sup>
Mexico	9,312	2	1,330	0	0	0
Netherlands	3,874	1	482	0	0	1 <sup>P</sup>
Pakistan	4,610	3	690	2	630	0
Romania	10,754	2	1,300	0	0	0
Russia	169,049	34	24,654	9	7,371	5 <sup>P</sup>
Slovakia	14,420	4	1,814	2	880	3 <sup>P</sup>
Slovenia	6,061	1	688	0	0	0
South Africa	14,749	2	1,860	0	0	0
Spain	54,832	7	7,121	0	0	1 <sup>L</sup>
Sweden	62,270	10	9,470	0	0	3 <sup>P</sup>

## APPENDIX S

### Nuclear Power Units by Nation (continued)

Country	Nuclear Power Production GWh*	In Operation		Under Construction or on Order		Shutdown
		Number of Units	Capacity Net MWe	Number of Units	Capacity Net MWe	
Switzerland	26,370	5	3,333	0	0	1 <sup>P</sup>
Ukraine	83,123	15	13,107	2	1,900	4 <sup>P</sup>
United Arab Emirates	0	0	0	3	4,035	0 <sup>P</sup>
United Kingdom	57,918	16	9,373	0	0	29 <sup>P</sup>
United States	797,067	99	98,639	5	5,633	33 <sup>P</sup>
<b>Total</b>	<b>2,410,373*</b>	<b>438</b>	<b>379,261</b>	<b>67</b>	<b>65,482</b>	<b>150<sup>P</sup> &amp; 2<sup>L</sup></b>

\* Annual electrical power production for 2014. Total includes information on Taiwan.

P = Permanent Shutdown

L = Long-Term Shutdown

Note: Operable, under construction, or on order; country's short-form name used; rounded to the nearest whole number.

Sources: IAEA Power Reactor Information System Database; analysis compiled by the NRC, April 2015.

## APPENDIX T

### Nuclear Power Units by Reactor Type, Worldwide

Reactor Type	In Operation	
	Number of Units	Net MWe
Pressurized light-water reactors (PWR)	279	261,052
Boiling light-water reactors (BWR)	78	74,686
Heavy-water reactors, all types (HWR) (PHWR)	49	24,549
Light-water-cooled graphite-moderated reactor (LWGR)	15	10,219
Gas-cooled reactors, all types (GCR)	15	8,175
Liquid-metal-cooled fast-breeder reactors (FBR)	2	580
<b>Total</b>	<b>438</b>	<b>379,261</b>

Note: MWe values rounded to the nearest whole number.

Source: IAEA Power Reactor Information System Database, [www.iaea.org](http://www.iaea.org)

Compiled by the NRC from data available as of June 2015.

## APPENDIX U

### Native American Reservations and Trust Lands within a 50-Mile Radius of a Nuclear Power Plant



#### ARIZONA

**Palo Verde**  
Ak-Chin Indian Community  
Tohono O'odham  
Trust Land  
Gila River Reservation  
Maricopa Reservation

#### CONNECTICUT

**Millstone**  
Mohegan Reservation  
Mashantucket Pequot  
Reservation  
Narragansett  
Reservation

#### FLORIDA

**St. Lucie**  
Brighton Reservation  
(Seminole Tribes  
of Florida)  
Fort Pierce Reservation  
**Turkey Point**  
Hollywood Reservation  
(Seminole Tribes  
of Florida)  
Micosukee Reservation  
Micosukee Trust Land

#### IOWA

**Duane Arnold**  
Sac & Fox Trust Land  
Sac & Fox Reservation

#### KANSAS

Iowa Reservation  
Iowa Trust Land

#### LOUISIANA

**River Bend**  
Tunica-Biloxi Reservation

#### MASSACHUSETTS

**Pilgrim**  
Wampanoag  
Tribe of Gay Head  
(Aquinnah)  
Trust Land

#### MICHIGAN

**Palisades**  
Pottawatomi Reservation  
Matcheбенашshewish  
Band  
Pokagon Reservation  
Pokagon Trust Land\*

**DC Cook**  
Pokagon Reservation  
Pokagon Trust Land

#### MINNESOTA

**Monticello**  
Shakopee Community  
Shakopee Trust Land  
Mille Lacs Reservation

**Prairie Island**  
Prairie Island Community\*  
Prairie Island Trust Land\*  
Shakopee Community  
Shakopee Trust Land

#### NEBRASKA

**Cooper**  
Sac & Fox Trust Land  
Sac & Fox Reservation  
Iowa Reservation  
Kickapoo

**Fort Calhoun**  
Omaha Reservation  
Winnebago Reservation  
Winnebago Trust Land

#### NEW YORK

**FitzPatrick**  
Onondaga Reservation  
Onida Reservation

**Nine Mile Point**  
Onondaga Reservation  
Onida Reservation

#### NORTH CAROLINA

**McGuire**  
Catawba Reservation

#### SOUTH CAROLINA

**Catawba**  
Catawba Reservation

**Oconee**  
Eastern Cherokee  
Reservation

**Summer**  
Catawba Reservation

#### WASHINGTON

**Columbia**  
Yakama Reservation  
Yakama Trust Land

#### WISCONSIN

**Point Beach**  
Oneida Trust Land  
Oneida Reservation

\* Tribe is located within the 10-mile emergency preparedness zone.

San Onofre and Kewaunee ceased operations.

Note: This table uses NRC-abbreviated reactor names and Native American Reservation and Trust land names.

There are no reservations or Trust lands within 50-miles of a reactor in Alaska or Hawaii. For more information on other Tribal concerns, go to the NRC Web site at: [www.nrc.gov](http://www.nrc.gov).

NRC-abbreviated reactor names listed

## APPENDIX V

## Regulatory Research Cooperative Agreements and Grants

<b>American Nuclear Society</b>	Support for the development and maintenance of probabilistic risk assessment (PRA)-related standards
<b>American Society of Mechanical Engineers</b>	Support in the following areas: Committee on Nuclear Risk Management on PRA standards, nuclear risk management, code comparison for the Multinational Design Evaluation Program, and harmonization of codes
<b>Electric Power Research Institute</b>	Research on irradiation-assisted stress-corrosion cracking and irradiation-assisted degradation of vessel internals materials
<b>International Commission on Radiological Protection</b>	Research on radiological protection standards
<b>Kansas State University</b>	Development of a High-Fidelity Model with Depleted Fuel for the Kansas State TRIGA Mark II Reactor
<b>National Academy of Sciences</b>	Support in the following areas: The Committee on Geological and Geotechnical Engineering, research to develop a consensus on the assessment of soil liquefaction potential and the related infrastructure consequences, research on porous rocks
<b>National Council on Radiation Protection Measurements Inc.</b>	Radiation Protection Guidance for the United States: SC 1-23 Guidance on Radiation Dose Limits for the Lens of the Eye and radiation protection guidance for the United States
<b>Northwestern University</b>	Service Lifetime Extension of Nuclear Power Plants: Prediction of Concrete Aging and Deterioration Through Accelerated Tests, Nondestructive Evaluation, and Stochastic Multiscale Computations
<b>Ohio State University</b>	Severe Accident Management Guidelines (SAMG) Validation within the Context of Severe Accident Uncertainties
<b>Pennsylvania State University</b>	Research on the Minimum Film Boiling Temperature for Nuclear Fuel Rods with Different Types of Fouling Layers and experiments on scalability of horizontal two-phase flow in small and large diameter pipes
<b>Purdue University</b>	Steel Plate Composite Walls: Behavior, Analysis and Design for Missile Impact
<b>Texas A&amp;M University</b>	Research on bypass flow in prismatic reactor blocks and prolonged station blackout conditions
<b>The Regents of the University of Colorado</b>	Experimental and Numerical Investigation of Alkali Silica Reaction in Nuclear Reactors
<b>University of California, Los Angeles</b>	Methodological and Software Enhancements of Dynamic PRA Platforms for Event Assessment Applications
<b>University of California-Berkeley</b>	Work on ground motion prediction models for central and eastern North America and postliquefaction residual strength
<b>University of Florida</b>	Synergistic Effect of Thermal Aging and Low-Dose Irradiation on the Cast Stainless Steels and Stainless Steel Welds
<b>University of Illinois</b>	Validation of the PARCS/PATHS/SCALE for PWR Depletion Using the BEAVRS Benchmark
<b>University of Maryland</b>	Study of the Implications of Multi-Unit Accidents in the Context of NRC's Quantitative Health Objectives
<b>University of Michigan</b>	Multiscale thermal hydraulic tool for nuclear power plant safety analyses and assessment of Trace interfacial area transport equations against high resolution experiments of two-phase vertical flows
<b>University of Tennessee</b>	Research on seismic hazards and associated ground motion for the East Tennessee Seismic Zone
<b>University of Toronto, Ontario</b>	Research to develop a tool to confirm safety margins for modular steel-concrete composite constructions under seismic loads

## APPENDIX W

### Significant Enforcement Actions Issued, 2014

Significant (escalated) Enforcement Actions include notices of violation (NOVs) for severity level (SL) I, II, or III violations; NOVs associated with inspection findings that the significance determination process (SDP) categorizes as white, yellow, or red; civil penalties (CPs); and enforcement-related orders. The NRC Enforcement Policy also allows related violations to be categorized collectively as a single problem. Escalated enforcement actions are issued to reactor, materials, and individual licensees; nonlicensees; and fuel cycle facility licensees.

Action #	Name	Type	Issue Date	Enforcement Action
EA-12-140	South Carolina Electric & Gas Co. (Summer)	Reactor	03/10/2014	Confirmatory Order result of an ADR mediation
EA-13-026	University Nuclear and Diagnostics	Materials	05/13/2014	NOV SL III
EA-13-059	Centro De Medicina Nuclear CE	Materials	04/08/2014	Order Imposing CP of \$7,000
EA-13-076	Entergy Nuclear IP2 LLC (Indian Point)	Reactor	04/29/2014	NOV SL III
EA-13-078	Entergy Nuclear IP2 LLC (Indian Point)	Reactor	04/29/2014	NOV SL III
EA-13-105	Geisser Engineering Corporation	Materials	03/20/2014 07/31/2014	NOV/CP SL II - \$11,200 (CP subsequently reduced) Order Imposing CP of \$8,400
EA-13-136	Geisser Engineering Corporation	Materials	03/20/2014	NOV SL II
EA-13-196	Chicago Bridge and Iron Company (Lake Charles, LA)	Reactor	09/25/2014	Confirmatory Order result of an ADR mediation
EA-13-215	Valley Quarries, Inc.	Materials	02/06/2014	Problem/CP SL III - \$3,500
EA-13-222	Omaha Public Power District (Fort Calhoun)	Reactor	04/25/2014	NOV White SDP finding resulting in plant inspections
EA-13-223	FPL Energy Duane Arnold, LLC (Duane Arnold)	Reactor	02/11/2014	NOV White SDP finding resulting in plant inspections
EA-13-227	Tetra Tech, Inc.	Materials	02/24/2014	NOV SL III
EA-13-233	Entergy Operations, Inc. (Waterford 3)	Reactor	03/28/2014	NOV White SDP finding resulting in plant inspections
EA-13-240	Wittnauer Worldwide, LP	Materials	10/24/2014	NOV SL III
EA-13-244	Kuehne Company	Materials	03/20/2014	NOV SL III
EA-13-247	R.E. Ginna Nuclear Power Plant, LLC	Reactor	04/17/2014	NOV White SDP finding resulting in plant inspections
EA-13-251	ATC Group Services, Inc., d/b/a Car	Materials	11/19/2014	NOV/CP SL III - \$3,500
EA-14-001	City of Kirksville, Missouri	Materials	03/17/2014	NOV SL III
EA-14-005	Tennessee Valley Authority (Browns Ferry)	Reactor	04/30/2014 05/01/2014	NOV White SDP finding resulting in plant inspections Confirmatory Order result of an ADR mediation

## APPENDIX W

## Significant Enforcement Actions Issued, 2014 (continued)

Action #	Name	Type	Issue Date	Enforcement Action
EA-14-008	Entergy Operations, Inc. (Arkansas Nuclear One, Units 1 and 2)	Reactor	06/23/2014	2 NOV Yellow SDP findings resulting in plant inspections
EA-14-009	Entergy Operations, Inc. (River Bend)	Reactor	12/03/2014	Confirmatory Order, with a CP of \$70,000, result of ADR mediation
EA-14-013	Entergy Nuclear Operations, Inc. (Palisades)	Reactor	07/21/2014	Confirmatory Order result of an ADR mediation
EA-14-017	Southern Nuclear Operating Co., Inc. (Farley)	Reactor	02/14/2014	NOV White SDP finding resulting in plant inspections
EA-14-024	Wolf Creek Nuclear Operating Corp. (Wolf Creek)	Reactor	07/01/2014	NOV White SDP finding resulting in plant inspections
EA-14-026	Dominion NDT Services, Inc.	Materials	04/02/2014	NOV SL III
EA-14-028	IUPUI/Indiana University Medical Center	Materials	04/03/2014	NOV SL III
EA-14-029	ECS Carolinas, LLP	Materials	04/23/2014	Problem SL III
EA-14-030	Dominion Engineering Associates, Inc.	Materials	12/18/2014	NOV/CP SL III - \$3,500
EA-14-072	Metro Cardiovascular Diagnostics	Materials	09/30/2014	NOV/CP SL III - \$3,500
EA-14-075	ConAgra Foods	Materials	08/01/2014	Problem SL III
EA-14-089	Idahoan Foods	Materials	10/16/2014	Problem SL III
EA-14-091	Duke Energy Corp. (Oconee 1)	Reactor	08/12/2014	NOV White SDP finding resulting in plant inspections
EA-14-092	Dominion Nuclear Connecticut, Inc. (Millstone 3)	Reactor	10/20/2014	NOV White SDP finding resulting in plant inspections
EA-14-094	FirstEnergy Nuclear Operating Co. (Davis-Besse)	Reactor	06/30/2014	Confirmatory Order
EA-14-100	Calvert Cliffs Nuclear Power Plant, Inc. (Calvert Cliffs)	Reactor	10/27/2014	NOV White SDP finding resulting in plant inspections
EA-14-106	City of St. Peters, Missouri	Materials	08/19/2014	NOV SL III
EA-14-108	Diagnostic Imaging Centers, P.A.	Materials	08/26/2014	NOV SL III
EA-14-112	Southern Nuclear Operating Co., Inc. (Vogtle)	Reactor	08/06/2014	NOV White SDP finding resulting in plant inspections
EA-14-113	Kruger Technologies Inc.	Materials	10/28/2014	Confirmatory Order result of an ADR mediation

## APPENDIX W

### Significant Enforcement Actions Issued, 2014 (continued)

Action #	Name	Type	Issue Date	Enforcement Action
EA-14-115	Truman Medical Center	Materials	10/08/2014	NOV SL III
EA-14-116	Bradley D. Bastow, D.O.	Materials	11/06/2014	Problem/CP SL III - \$7,000
EA-14-167	Kim Engineering	Materials	12/23/2014	NOV SL III
EA-14-187	Omaha Public Power District (Fort Calhoun)	Reactor	11/25/2014	NOV White SDP finding resulting in plant inspections
IA-12-045	Mr. Michael P. Cooley	Reactor	03/10/2014	Prohibition Order
IA-13-012	Mr. Armando N. Clavero	Materials	05/13/2014	Prohibition Order
IA-13-033	Mr. George Geisser, III	Materials	07/17/2014	Prohibition Order
IA-13-055	Mr. John Amburgey	Reactor	01/13/2014	NOV SL III
IA-13-059	Mr. Richard B. Smith	Reactor	05/14/2014	Prohibition Order
IA-13-064	Mr. Daniel L. Wilson	Reactor	04/29/2014	Prohibition Order
IA-14-002	Mr. Lane McHugh	Reactor	02/24/2014	NOV SL III
IA-14-004	Mr. Douglas D. Stouffer	Reactor	04/14/2014	NOV SL III
IA-14-007	Mr. Trey Brattin	Materials	07/24/2014	NOV SL III
IA-14-014	Mr. Donald K. Brown	Reactor	07/09/2014	NOV SL III
IA-14-021	Mr. Gary Meekins	Reactor	07/09/2014	NOV SL III
IA-14-025	Mr. James Chaisson	Materials	07/11/2014	Prohibition Order

Note: Reactor facilities in a decommissioning status are listed as materials licensees. The NRC report on Issued Significant Enforcement Actions can be found on the NRC Web site at [www.nrc.gov/about-nrc/regulatory/enforcement/current.html](http://www.nrc.gov/about-nrc/regulatory/enforcement/current.html).

## APPENDIX X

### Quick-Reference Metric Conversion Tables

#### SPACE AND TIME

Quantity	From Inch-Pound Units	To Metric Units	Multiply by
Length	mi (statute)	km	1.609347
	yd	m	*0.9144
	ft (int)	m	*0.3048
	in	cm	*2.54
Area	mi <sup>2</sup>	km <sup>2</sup>	2.589998
	acre	m <sup>2</sup>	4,046.873
	yd <sup>2</sup>	m <sup>2</sup>	0.8361274
	ft <sup>2</sup>	m <sup>2</sup>	*0.09290304
	in <sup>2</sup>	cm <sup>2</sup>	*6.4516
Volume	acre foot	m <sup>3</sup>	1,233.489
	yd <sup>3</sup>	m <sup>3</sup>	0.7645549
	ft <sup>3</sup>	m <sup>3</sup>	0.02831685
	ft <sup>3</sup>	L	28.31685
	gal	L	3.785412
	fl oz	mL	29.57353
	in <sup>3</sup>	cm <sup>3</sup>	16.38706
Velocity	mi/h	km/h	1.609347
	ft/s	m/s	*0.3048
Acceleration	ft/s <sup>2</sup>	m/s <sup>2</sup>	*0.3048

#### NUCLEAR REACTION AND IONIZING RADIATION

Quantity	From Inch-Pound Units	To Metric Units	Multiply by
Activity (of a radionuclide)	curie (Ci)	MBq	*37,000.0
	dpm	becquerel (Bq)	0.016667
Absorbed dose	rad	gray (Gy)	*0.01
	rad	cGy	*1.0
Dose equivalent	rem	sievert (Sv)	*0.01
	rem	mSv	*10.0
	mrem	mSv	*0.01
	mrem	μSv	*10.0
Exposure (X-rays and gamma rays)	roentgen (R)	C/kg (coulomb)	0.000258

## APPENDIX X

### Quick-Reference Metric Conversion Tables (continued)

#### HEAT

Quantity	From Inch-Pound Units	To Metric Units	Multiply by
Thermodynamic temperature	°F	K	*K = (°F + 459.67)/1.8
Celsius temperature	°F	°C	*°C = (°F - 32)/1.8
Linear expansion coefficient	1/°F	1/K or 1/°C	*1.8
Thermal conductivity	(Btu • in)/(ft <sup>2</sup> • h • °F)	W/(m • °C)	0.1442279
Coefficient of heat transfer	Btu / (ft <sup>2</sup> • h • °F)	W/(m <sup>2</sup> • °C)	5.678263
Heat capacity	Btu/°F	kJ/°C	1.899108
Specific heat capacity	Btu/(lb • °F)	kJ/(kg • °C)	*4.1868
Entropy	Btu/°F	kJ/°C	1.899108
Specific entropy	Btu/(lb • °F)	kJ/(kg • °C)	*4.1868
Specific internal energy	Btu/lb	kJ/kg	*2.326

#### MECHANICS

Quantity	From Inch-Pound Units	To Metric Units	Multiply by
Mass (weight)	ton (short)	t (metric ton)	*0.90718474
	lb (avdp)	kg	*0.45359237
Moment of mass	lb • ft	kg • m	0.138255
Density	ton (short)/yd <sup>3</sup>	t/m <sup>3</sup>	1.186553
	lb/ft <sup>3</sup>	g/m <sup>3</sup>	16.01846
Concentration (mass)	lb/gal	g/L	119.8264
Momentum	lb • ft/s	kg • m/s	0.138255
Angular momentum	lb • ft <sup>2</sup> /s	kg • m <sup>2</sup> /s	0.04214011
Moment of inertia	lb • ft <sup>2</sup>	kg • m <sup>2</sup>	0.04214011
Force	kip (kilopound)	kN (kilonewton)	4.448222
	lbf	N (newton)	4.448222
Moment of force, torque	lbf • ft	N • m	1.355818
	lbf • in	N • m	0.1229848
Pressure	atm (std)	kPa (kilopascal)	*101.325
	bar	kPa	*100.0
	lbf/in <sup>2</sup> (formerly psi)	kPa	6.894757
	inHg (32 °F)	kPa	3.38638
	ftH <sub>2</sub> O (39.2 °F)	kPa	2.98898
	inH <sub>2</sub> O (60 °F)	kPa	0.24884
	mmHg (0 °C)	kPa	0.133322

## APPENDIX X

### Quick-Reference Metric Conversion Tables (continued)

MECHANICS (continued)			
Quantity	From Inch-Pound Units	To Metric Units	Multiply by
Stress	kip/in <sup>2</sup> (formerly ksi)	MPa	6.894757
	lbf/in <sup>2</sup> (formerly psi)	MPa	0.006894757
	lbf/in <sup>2</sup> (formerly psi)	kPa	6.894757
	lbf/ft <sup>2</sup>	kPa	0.04788026
Energy, work	kWh	MJ	*3.6
	cal <sup>th</sup>	J (joule)	*4.184
	Btu	kJ	1.055056
	ft • lbf	J	1.355818
	therm (US)	MJ	105.4804
Power	Btu/s	kW	1.055056
	hp (electric)	kW	*0.746
	Btu/h	W	0.2930711

\* Exact conversion factors

Note: The information contained in this table is intended to provide familiarization with commonly used SI units and provide a quick reference to aid in the understanding of documents containing SI units. The conversion factors provided have not been approved as NRC guidelines for the development of licensing actions, regulations, or policy.

To convert from metric units to inch-pound units, divide the metric unit by the conversion factor.

Sources: Federal Standard 376B (January 27, 1993), "Preferred Metric Units for General Use by the Federal Government," and International Commission on Radiation Units and Measurements, ICRU Report 33 (1980), "Radiation Quantities and Units"

## APPENDIX Y

### Progress List of Rulemaking for Nuclear Material and Waste

1. 10 CFR Part 20, "Standards for Protection Against Radiation"
2. 10 CFR Part 35, "Medical Use of Byproduct Material"
3. 10 CFR Part 37, "Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material"
4. 10 CFR Part 40, "Domestic Licensing of Source Material"
5. 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste"
6. 10 CFR Part 73, "Physical Protection of Plants and Materials"
7. 10 CFR Part 74, "Material Control and Accounting of Special Nuclear Material"

## APPENDIX Z

### Laws Governing the U.S. Nuclear Regulatory Commission

1. Atomic Energy Act of 1954, as amended (Pub. L. 83–703)
2. Energy Reorganization Act of 1974, as amended (Pub. L. 93–438)
3. Reorganization Plan No. 1 of 1980, 5 U.S.C., App 1.
4. Uranium Mill Tailings Radiation Control Act of 1978, as amended (Pub. L. 95–604)
5. Nuclear Non-Proliferation Act of 1978 (Pub. L. 95–242)
6. West Valley Demonstration Project Act of 1980 (Pub. L. 96–368)
7. Nuclear Waste Policy Act of 1982, as amended (Pub. L. 97–425)
8. Low-Level Radioactive Waste Policy Amendments Act of 1985 (Pub. L. 99–240)
9. Energy Policy Act of 1992 (Pub. L. 102–486)
10. Energy Policy Act of 2005 (Pub. L. 109–58)

### Fundamental Laws Governing Civilian Uses of Radioactive Materials

#### *Nuclear Materials and Facilities*

1. Atomic Energy Act of 1954, as amended
2. Energy Reorganization Act of 1974, as amended
3. Reorganization Plan No. 1 of 1980

#### *Radioactive Waste*

1. Nuclear Waste Policy Act of 1982, as amended
2. Low-Level Radioactive Waste Policy Amendments Act of 1985
3. Uranium Mill Tailings Radiation Control Act of 1978

#### *Nonproliferation*

1. Nuclear Non-Proliferation Act of 1978

### Fundamental Laws Governing the Processes of Regulatory Agencies

1. Administrative Procedure Act (5 U.S.C. Chapters 5 through 8)
2. National Environmental Policy Act

## APPENDIX AA International Activities

### CONVENTIONS AND TREATIES

#### **Nuclear Treaties—But Not Touching on Arms Control Agreements**

1. Treaty on the Non-Proliferation of Nuclear Weapons, entry into force on March 5, 1970, United States (U.S.) is a party to the Treaty
2. Treaty for the Prohibition of Nuclear Weapons in Latin America (Tlatelolco Treaty), entry into force for each government individually, U.S. is a party to the specific protocols appended to the Treaty
3. Three to Four other treaties specifying nuclear weapons free zones in Africa, the South Pacific (Rarotonga), and Southeast Asia, including one being negotiated on the Middle East; the U.S. is only bound by specific protocols

#### **Safety and Security Treaties, Conventions and Agreements under IAEA Auspices**

1. Convention on Early Notification of a Nuclear Accident, entry into force 27 October 1986, U.S. is a party
2. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, entry into force 26 February 1987, U.S. is a party
3. Convention on Nuclear Safety, entry into force 24 October 1996, U.S. is a party
4. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, entry into force 18 June 2001, U.S. is a party
5. Convention on the Physical Protection of Nuclear Material (CPPNM), entry into force 8 February 1987, U.S. is a party
6. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, entry into force 30 August 1975, U.S. is a party (also to amendments in 1978 (incineration), 1978 (disputes), 1980 (list of substances), 1989 (procedures), 1993 (banning dumping into sea of low-level radioactive wastes), 1996 (protocol to replace the 1972 Convention with a more restrictive text regulating the use of the sea as a depository for waste materials)
7. Convention on Supplementary Compensation for Nuclear Damage

#### **Safeguards Treaties, Conventions, and Agreements under IAEA Auspices**

1. Model Protocol Additional to the Agreement Between State(s) and the IAEA for the Application of Safeguards, entry into force 6 April 1989, U.S. is a party

**APPENDIX AA**  
**International Activities (continued)**

**LIST OF IMPORT AND EXPORT LICENSES ISSUED FOR 2014**

<b>License Number</b>	<b>Applicant</b>	<b>Docket Number</b>
IW012/05	PermaFix/DSSI	11005322
IW016/02	Eastern Technologies, Inc.	11005602
IW022/02	Perma-Fix Northwest, Inc.	11005700
IW022/03	Perma-Fix Northwest, Inc.	11005700
IW032	Eastern Technologies, Inc.	11006100
XB1328	Humboldt Scientific, Inc.	11006050
XB1328/01	Humboldt Scientific, Inc.	11006050
XB1329	Rapiscan Systems, Inc.	11006059
XB1329/01	Rapiscan Systems, Inc.	11006059
XB1329/02	Rapiscan Systems, Inc.	11006059
XCOM1133/03	Global Nuclear Fuel - Americas, LLC	11005160
XCOM1222/01	The Barden Corporation	11006016
XCOM1231	Weir Valves & Controls USA Inc.	11005948
XCOM1232	ENERTECH, a business unit of Curtis-Wright Control Corporation	11005950
XCOM1237	Mytech Corporation	11005975
XCOM1238	Technetics Group Columbia	11005978
XCOM1239/01	Louisiana Energy Services, LLC	11005981
XCOM1240	Technetics Group Columbia	11005982
XCOM1240/01	Technetics Group Columbia	11005982
XCOM1242	Materion Brush Inc.	11005991
XCOM1245	Transco Products Inc.	11005999
XCOM1246	Westinghouse Electric Company LLC	11006001
XCOM1250	General Atomics	11006028
XCOM1252	Westinghouse Electric Company LLC.	11006040
XCOM1254	GE Oil and Gas-Dresser, Inc.	11006048
XCOM1255	Westinghouse Electric Company LLC	11006060
XCOM1256	Kingsbury, Inc.	11006071
XCOM1257	Pall Corporation	11006076
XCOM1259	ATI Wah Chang	11006079
XCOM1260	ATI Wah Chang	11006080
XCOM1261	ENERTECH, a business unit of Curtiss-Wright Flow Control Corporation	11006084
XCOM1262	Westinghouse Electric Company LLC	11006085
XCOM1263	Circor Aerospace, Inc.	11006087
XCOM1265	Materion Brush Inc.	11006094
XMAT413/01	Linde Electronics and Specialty Gases	11005877
XMAT422	Cambridge Isotope Laboratories, Inc.	11005997
XMAT423/01	Linde Electronics and Specialty Gases	11006029
XMAT425	Cambridge Isotope Laboratories, Inc.	11006062
XMAT426	Cambridge Isotope Laboratories, Inc.	11006063

## APPENDIX AA

### International Activities (continued)

#### LIST OF IMPORT AND EXPORT LICENSES ISSUED FOR 2014 (continued)

License Number	Applicant	Docket Number
XMAT427	Airgas Specialty Gases	11006098
XMAT428	Linde Gas North America LLC	11006093
XMAT429	Matheson Tri Gas, Inc.	11006116
XR135/07	GE-Hitachi Nuclear Energy Americas LLC	11001075
XSNM3066/05	Global Nuclear Fuel - Americas, L.L.C.	11005081
XSNM3135/04	Global Nuclear Fuel-Americas, L.L.C.	11005186
XSNM3622/02	Department of Energy - Oak Ridge	11006024
XSNM3627/02-R	Mitsui & Co. (U.S.A.), Inc.	11005848
XSNM3679	Transnuclear, Inc.	11005923
XSNM3708/01	Department of Energy - Oak Ridge	11005974
XSNM3716/01	Mitsui & Co. (U.S.A.), Inc.	11005996
XSNM3722	Transnuclear, Inc.	11006019
XSNM3725-R	Department of Energy - Savannah River	11006035
XSNM3726	Department of Energy - Oak Ridge	11006037
XSNM3727	Department of Energy - Oak Ridge	11006049
XSNM3728	AREVA NP Inc.	11006052
XSNM3729	Department of Energy - Oak Ridge	11006053
XSNM3730	Department of Energy - Oak Ridge	11006054
XSNM3731	Mitsui & Co. (U.S.A.), Inc.	11006056
XSNM3732	Transport Logistics International, Inc.	11006057
XSNM3733	AREVA NP Inc.	11006065
XSNM3734	Mitsui & Co. (U.S.A.), Inc.	11006066
XSNM3735	Transnuclear Inc.	11006067

#### Non-Appendix P Components Guide

(XSNM) denotes export of special nuclear material (plutonium, uranium-233, or uranium enriched above 0.711 percent, by weight, in the isotope uranium-235).

(XCOM) denotes export of minor reactor COMponents or other nuclear facility (e.g., nuclear fabrication) components under NRC jurisdiction (refer to Title 10 of the *Code of Federal Regulations* Part 110, Export and Import of Nuclear Equipment and Material, Appendix A, Items (5)–(9) for minor reactor components and Appendices B–K and N–O for other nuclear facility components).

(XSOU) denotes export of source material (natural or depleted uranium; thorium; a mixture of uranium and thorium other than special nuclear material; or certain ores [e.g., tantalum and niobium that contain, by weight, 0.05 percent or more of the aforementioned materials for nonnuclear end use]).

(XB) denotes export of byproduct material, 10 CFR Part 110, Appendix L, for an illustrative list of byproduct materials under NRC jurisdiction.

(XR) denotes export of reactor facilities, 10 CFR Part 110, Appendix A, Items (1) – (4).

(IW) denotes import of radioactive waste.

(XW) denotes export of radioactive waste.

## APPENDIX AA

### International Activities (continued)

#### LIST OF IMPORT AND EXPORT LICENSES ISSUED FOR 2014 (continued)

License Number	Applicant	Docket Number
XSNM3736	Westinghouse Electric Company LLC	11006069
XSNM3737	AREVA NP Inc.	11006072
XSNM3738	Transport Logistics International	11006076
XSNM3739	Department of Energy - Oak Ridge	11006078
XSNM3740	Transport Logistics International	11006081
XSNM3741	AREVA NP Inc.	11006083
XSNM3742	AREVA NP Inc.	11006086
XSNM3743-R	Transport Logistics International, Inc.	11006095
XSNM3744	Transport Logistics International, Inc.	11006097
XSNM3745	Department of Energy - Oak Ridge	11006098
XSNM3746	Transnuclear Inc.	11006109
XSNM3747	AREVA NP Inc.	11006110
XSNM3748	Transport Logistics International, Inc.	11006111
XSOU8789/06	ConverDyn	11005360
XSOU8798/04	RSB Logistics	11005445
XSOU8828/01	Global Advanced Metals USA, Inc.	11006003
XW008/04	Diversified Scientific Services, Inc. (DSSI)	11005323
XW012/02	Perma-Fix Northwest, Inc.	11005699
XW012/03	Perma-Fix Northwest, Inc.	11005699
XW016/01	Eastern Technologies, Inc.	11005825
XW020	EnergySolutions	11006061
XW021	Eastern Technologies, Inc.	11006101

#### Appendix P to 10 CFR Part 110 Components Guide

Appendix P licenses support the use of radioactive sealed sources for a variety of medical, industrial, research, and educational activities. Some applicants have previously obtained a combined export/import license to allow export or import, use, resale, and import or export back to the supplier for recycling. These combined licenses are no longer appropriate and can no longer be amended going forward, given the authorization for imports of Appendix P materials under a general license (see 10 CFR 110.27, "General License for Import"). These combined import/export licenses needing amendment are converted to export-only licenses. The 2010 changes to 10 CFR Part 110 generally necessitate specific licenses for only Appendix P, Category 1 and 2 exports.

**APPENDIX AA****International Activities (continued)****LIST OF THE NRC'S PARTICIPATION WITH MULTILATERAL ORGANIZATIONS****International Commission on Radiological Protection****International Atomic Energy Agency**

- Commission on Safety Standards
  - Nuclear Safety Standards Committee
  - Radiation Safety Standards Committee
  - Transport Safety Standards Committee
  - Waste Safety Standards Committee
- Nuclear Security Guidance Committee

**International Nuclear Regulators Association****Multinational Design Evaluation Program****Nuclear Energy Agency**

- NEA Steering Committee for Nuclear Energy
- Committee on Nuclear Regulatory Activities
  - Working Group on Inspection Practices
  - Working Group on Operating Experience
  - Working Group on Public Communication of Nuclear Regulatory Organisations
  - Working Group on the Regulation of New Reactors
  - Safety of Research Reactors Task Group
  - Senior-Level Task Group on Impacts of the Fukushima Accident
  - Task Group of Nonconforming, Counterfeit, Fraudulent, and Suspect Items
  - Task Group on Accident Management
- Committee on Radiation Protection and Public Health
  - Expert Group on the Implications of ICRP Recommendations
  - Expert Group on Occupational Exposure
  - Expert Group on the Public Health Perspective in Radiological Protection
  - Expert Group on the Radiological Protection Aspects of the Fukushima Accident
  - Expert Group on Radiological Protection Sciences
  - Working Party on Nuclear Emergency Matters

## APPENDIX AA

### International Activities (continued)

#### LIST OF THE NRC'S PARTICIPATION WITH MULTILATERAL ORGANIZATIONS

- Committee on the Safety of Nuclear Installations
  - CSNI Program Review Group
  - Working Group on Integrity and Aging of Components and Structures
  - Working Group on Analysis and Management of Accidents
  - Working Group on Risk Assessment
  - Working Group on Human and Organisational Factors
  - Working Group on Fuel Safety
  - Working Group on Fuel Cycle Safety
- Radioactive Waste Management Committee
  - Forum on Stakeholder Confidence
  - Integration Group for the Safety Case of Radioactive Waste Repositories
  - Regulators' Forum
  - Working Party on Decommissioning and Dismantling

#### United Nations Scientific Committee on the Effects of Atomic Radiation

#### BILATERAL INFORMATION EXCHANGE AND COOPERATION AGREEMENTS WITH THE NRC

##### Agreement Country

Argentina	Finland	Korea, Rep. of	Spain
Armenia	France	Lithuania	Sweden
Australia	Germany	Mexico	Switzerland
Belgium	Greece	Netherlands	Tecro (Taiwan)
Brazil	Hungary	Peru	Thailand
Bulgaria	India	Philippines	Turkey
Canada	Indonesia	Poland	Ukraine
China	Israel	Romania	United Arab Emirates
Croatia	Italy	Russia	United Kingdom
Czech Republic	Japan	Slovakia	Vietnam
Egypt	Jordan	Slovenia	
EURATOM	Kazakhstan	South Africa	

Note: The country's short-form name is used. NRC's Technical Arrangements are initiated and renewed for 5-year terms.

EURATOM—The European Atomic Energy Community

Tecro (Taiwan) is the Taipei Economic and Cultural Representative Office in the United States.