







# Appendices

This edition of the Digest provides a snapshot of data; for the most current information and data collection, please visit the NRC Web site Dataset Index Web page at http://www.nrc.gov/reading-rm/doc-collections/datasets/.

### APPENDICES

#### **Abbreviations**

	riations		
ABWR	advanced boiling-water reactor	ESBWR	Economic Simplified Boiling-
AC	Allis Chalmers		Water Reactor
ACRS	Advisory Committee on Reactor	ESP	early site permit
AONO	Safeguards	EVESR	ESADA (Empire States
ADAMS	Agencywide Documents Access		Atomic Development
ADAMO	and Management System		Associates)
ADR	Alternative Dispute Resolution		Vallecitos Experimental
AEC	Atomic Energy Commission (U.S.)		Superheat Reactor
AEP	American Electric Power Company	Exp. Date	expiration date of operating
AGN	solid homogeneous core (Aerojet-	•	license
,	General Nucleonics)	FBR	fast breeder reactor
ASLB	Atomic Safety and Licensing Board	FEMA	Federal Emergency Management
B&R	Burns & Roe		Agency
B&W	Babcock & Wilcox	FERC	Federal Energy Regulatory
BALD	Baldwin Associates		Commission
BECH	Bechtel	FLUR	Fluor Pioneer
BRRT	Brown & Root	FOIA	Freedom of Information Act
BWR	boiling-water reactor	FTE	full-time equivalent
CE	Combustion Engineering	FW	Foster Wheeler
CFR	Code of Federal Regulations	FY	fiscal year
CO	Commission order	G&H	Gibbs & Hill
Co	company	GA	General Atomic
COL	combined license	GCR	gas-cooled reactor
Comm. Op.	date of commercial operation	GE	General Electric
Con Type	containment type	GEH	General Electric-Hitachi Nuclear
DRYAMB	dry, ambient pressure		Energy
DRYSUB	dry, subatmospheric	GEIS	generic environmental impact
ICECND	wet, ice condenser	OFTD	statement
MARK 1	wet, Mark I	GETR	General Electric Test Reactor
MARK 2	wet, Mark II	GHDR	Gibbs & Hill & Durham & Richardson
MARK 3	wet, Mark III	GIL	Gilbert Associates
CP	civil penalty	GL	general license
CP Issued	date of construction permit	GPC	
0000	issuance		Georgia Power Company
CRGR	Committee To Review Generic	GW	gigawatt
	Committee To Review Generic Requirements	GW GWh	gigawatt gigawatts hours
CVP	Committee To Review Generic Requirements civil penalties	GW	gigawatt gigawatts hours high-temperature gas
	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube	GW GWh	gigawatt gigawatts hours high-temperature gas (reactor)
CVP CVTR	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor	GW GWh HTG	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor
CVP	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison	GW GWh HTG	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy
CVP CVTR	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company	GW GWh HTG	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency
CVP CVTR CWE	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International	GW GWh HTG HWR IAEA	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy
CVP CVTR CWE DANI DBDB	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel	GW GWh HTG HWR IAEA INES	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale
CVP CVTR CWE	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat	GW GWh HTG HWR IAEA INES	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel
CVP CVTR CWE DANI DBDB DBT DC	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification	GW GWh HTG HWR IAEA INES ISFSI	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation
CVP CVTR CWE DANI DBDB DBT	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security	GW GWh HTG HWR IAEA INES ISFSI ISR	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery
CVP CVTR CWE DANI DBDB DBT DC	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.)	GW GWh HTG HWR IAEA INES ISFSI ISR KAIS	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s)
CVP CVTR CWE DANI DBDB DBT DC DHS	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.)	GW GWh HTG HWR IAEA INES ISFSI ISR KAIS KI KW LLP	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop
CVP CVTR CWE DANI DBDB DBT DC DHS	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.)	GW GWh HTG HWR IAEA INES ISFSI ISR KAIS KI kW LLP LLW	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste
CVP CVTR CWE DANI DBDB DBT DC DHS	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.) Department of Transportation (U.S.)	GW GWh HTG HWR IAEA INES ISFSI ISR KAIS KI KW LLP LLP LLW LMFB	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor)
CVP CVTR CWE DANI DBDB DBT DC DHS DOE DOT DUKE	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.) Department of Transportation (U.S.) Duke Power Company	GW GWH HTG  HWR IAEA  INES ISFSI  ISR KAIS KI KW LLP LLW LMFB LR Issued	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor) license renewal issued
CVP CVTR CWE DANI DBDB DBT DC DHS DOE DOT DUKE EBSO	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.) Department of Transportation (U.S.) Duke Power Company Ebasco	GW GWh HTG HWR IAEA INES ISFSI ISR KAIS KI KW LLP LLP LLW LMFB	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor) license renewal issued light-water-cooled graphite-
CVP CVTR CWE DANI DBDB DBT DC DHS DOE DOT DUKE EBSO	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.) Department of Transportation (U.S.) Duke Power Company Ebasco Energy Information	GW GWH HTG  HWR IAEA  INES ISFSI  ISR KAIS KI kW LLP LLW LMFB LR Issued LWGR	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor) license renewal issued light-water-cooled graphite- moderated reactor
CVP CVTR CWE DANI DBDB DBT DC DHS DOE DOT DUKE EBSO EIA	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.) Department of Transportation (U.S.) Duke Power Company Ebasco Energy Information Administration (DOE)	GW GWH HTG  HWR IAEA  INES ISFSI  ISR KAIS KI kW LLP LLW LMFB LR Issued LWGR  MOX	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor) license renewal issued light-water-cooled graphite- moderated reactor mixed-oxide
CVP CVTR  CWE  DANI DBDB DBT DC DHS  DOE DOT DUKE EBSO EIA  EIS EPA	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.) Department of Transportation (U.S.) Duke Power Company Ebasco Energy Information Administration (DOE) environmental impact statement Environmental Protection Agency (U.S.)	GW GWH HTG  HWR IAEA  INES ISFSI  ISR KAIS KI kW LLP LLW LMFB LR Issued LWGR  MOX MW	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor) license renewal issued light-water-cooled graphite- moderated reactor mixed-oxide megawatt(s)
CVP CVTR CWE DANI DBDB DBT DC DHS DOE DOT DUKE EBSO EIA EIS EPA	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Flergy (U.S.) Department of Transportation (U.S.) Duke Power Company Ebasco Energy Information Administration (DOE) environmental impact statement Environmental Protection Agency (U.S.) Evolutionary Power Reactor	GW GWH HTG HWR IAEA INES ISFSI ISR KAIS KI KW LLP LLW LMFB LR Issued LWGR MOX MW MWE	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor) license renewal issued light-water-cooled graphite- moderated reactor mixed-oxide megawatt(s) megawatt(s) electric
CVP CVTR CWE DANI DBDB DBT DC DHS DOE DOT DUKE EBSO EIA EIS EPA	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.) Department of Transportation (U.S.) Duke Power Company Ebasco Energy Information Administration (DOE) environmental impact statement Environmental Protection Agency (U.S.) Evolutionary Power Reactor emergency planning zone	GW GWH HTG HWR IAEA INES ISFSI ISR KAIS KI kW LLP LLW LMFB LR Issued LWGR MOX MW MWE MWH	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor) license renewal issued light-water-cooled graphite- moderated reactor mixed-oxide megawatt(s) megawatt(s) electric megawatt-hour(s)
CVP CVTR CWE DANI DBDB DBT DC DHS DOE DOT DUKE EBSO EIA EIS EPA	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.) Department of Transportation (U.S.) Duke Power Company Ebasco Energy Information Administration (DOE) environmental impact statement Environmental Protection Agency (U.S.) Evolutionary Power Reactor emergency planning zone emergency response	GW GWH HTG HWR IAEA INES ISFSI ISR KAIS KI kW LLP LLW LMFB LR Issued LWGR MOX MW MWE MWH MWH	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor) license renewal issued light-water-cooled graphite- moderated reactor mixed-oxide megawatt(s) megawatt(s) electric megawatt-hour(s) megawatt(s) thermal
CVP CVTR CWE DANI DBDB DBT DC DHS DOE DOT DUKE EBSO EIA EIS EPA	Committee To Review Generic Requirements civil penalties Carolinas-Virginia Tube Reactor Commonwealth Edison Company Daniel International Duke & Bechtel design-basis threat design certification Department of Homeland Security (U.S.) Department of Energy (U.S.) Department of Transportation (U.S.) Duke Power Company Ebasco Energy Information Administration (DOE) environmental impact statement Environmental Protection Agency (U.S.) Evolutionary Power Reactor emergency planning zone	GW GWH HTG HWR IAEA INES ISFSI ISR KAIS KI kW LLP LLW LMFB LR Issued LWGR MOX MW MWE MWH	gigawatt gigawatts hours high-temperature gas (reactor) heavy-water reactor International Atomic Energy Agency International Nuclear Event Scale independent spent fuel storage installation in situ recovery Kaiser Engineers potassium iodide kilowatt(s) B&W lowered loop low-level radioactive waste liquid metal fast breeder (reactor) license renewal issued light-water-cooled graphite- moderated reactor mixed-oxide megawatt(s) megawatt(s) electric megawatt-hour(s)

NEA	Nuclear Energy Agency	ROP	Reactor Oversight Process
NMMSS	Nuclear Material Management and	RTR	research and test reactor
	Safeguards System	S&L	Sargent & Lundy
NOV	notice(s) of violation	S&W	Stone & Webster
NOVF	notice(s) of violation associated	SAMG	Severe Accident Management
	with inspection findings	0,11,10	Guidance
NOVSL	notice(s) of violation for severity	SCF	sodium-cooled fast (reactor)
	level	SDP	significance determination
NRC	Nuclear Regulatory		process
	Commission (U.S.)	SGEC	architect for Vogtle
NSP	Northern States Power	SHINE	SHINE Medical Technologies, Inc.
	Company	SI	système internationale
NSSS	nuclear steam system		(d'unités) (International
	supplier and design type		System of Units)
GE 2	GE Type 2	SL	severity level
GE 3	GE Type 3	SOARCA	State-of-the-Art Reactor
GE 4	GE Type 4		Consequence Analysis
GE 5	GE Type 5	SSI	Southern Services
GE 6	GE Type 6		Incorporated
WEST 2LP	Westinghouse Two-Loop	STARS	Strategic Teaming and Resource
WEST 3LP	Westinghouse Three-Loop		Sharing Group
WEST 4LP	Westinghouse Four-Loop	STP	South Texas Project
NSTS	National Source Tracking System	TMI-2	Three Mile Island Unit 2
OECD	Organisation for Economic	Sv	sievert
	Co-operation and Development	TRIGA	Training Reactor and
OL	operating license		Isotopes Production,
OL Issued	date of latest full power		General Atomics
	operating license	TVA	Tennessee Valley Authority
PG&E	Pacific Gas & Electric	UE&C	United Engineers & Constructors
	Company	USEC	U.S. Enrichment Corporation
PRA	probabilistic risk assessment	<b>US-APWR</b>	United States [version of]
PRIS	Power Reactor Information		Advanced Pressurized-Water
	System		Reactor
PSEG	Public Service Electric and	VBWR	Vallecitos Boiling-Water
	Gas Company		Reactor
PHWR	pressurized heavy water reactor	WDCO	Westinghouse Development
PWR	pressurized-water reactor		Corporation
RIC	Regulatory Information	WEST	Westinghouse Electric
	Conference	WNA	World Nuclear Association
RLP	B&W raised loop		

Alabama	AL	Kentucky	KY	Ohio	ОН
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
lowa	IA	North Carolina	NC	Wisconsin	WI
Kansas	KS	North Dakota	ND	Wyoming	WY

#### **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	mi²	km²	2.589998
	acre	m <sup>2</sup>	4,046.873
	yd²	m <sup>2</sup>	0.8361274
	ft²	m <sup>2</sup>	*0.09290304
	in²	cm <sup>2</sup>	*6.4516
Volume	acre foot	m³	1,233.489
	yd³	$m^3$	0.7645549
	ft <sup>3</sup>	$m^3$	0.02831685
	ft³	L	28.31685
	gal	L	3.785412
	fl oz	mL	29.57353
	in³	cm <sup>3</sup>	16.38706
Velocity	mi/h	km/h	1.609347
	ft/s	m/s	*0.3048
Acceleration	ft/s²	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 (centigray)	*1.0
Dose equivalent	rem	sievert (Sv)	*0.01
	rem	mSv	*10.0
	mrem	mSv	*0.01
	mrem	μSv (microsivert)	*10.0
Exposure	roentgen (R)	C/kg (coulomb)	0.000258
(X-rays and gamma rays)			

#### HEAT

Quantity	From Inch-Pound Units	To Metric Units	Multiply by
Thermodynamic	°F	K	*K = (°F + 459.67)/1.8
temperature			
Celsius temperature	°F	°C	*°C = (°F-32)/1.8
Linear expansion	1/°F	1/K or 1/°C	*1.8
coefficient			
Thermal conductivity	(Btu • in)/(ft² • h • °F)	W/(m • °C)	0.1442279
Coefficient of heat	Btu / (ft² • h • °F)	W/(m² • °C)	5.678263
transfer			
Heat capacity	Btu/°F	kJ/°C	1.899108
Specific heat capacity	Btu/(lb • °F)	kJ/(kg • °C)	*4.1868

#### **OUICK-REFERENCE METRIC CONVERSION TABLES**

#### **HEAT** (continued)

Entropy	Btu/°F	kJ/°C	1.899108	
Specific entropy	Btu/(lb • °F)	kJ/(kg • °C)	*4.1868	
Specific internal	Btu/lb	kJ/kg	*2.326	
enerav				

#### MECHANICS

	MECHANIC			
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)/yd³	t/m³	1.186553	
	lb/ft³	g/m³	16.01846	
Concentration (mass)	lb/gal	g/L	119.8264	
Momentum	lb • ft/s	kg • m/s	0.138255	
Angular momentum	lb • ft²/s	kg • m²/s	0.04214011	
Moment of inertia	lb • ft²	kg • m²	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/in2 (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	
Stress	kip/in² (formerly ksi)	MPa	6.894757	
	lbf/in2 (formerly psi)	MPa	0.006894757	
	lbf/in2 (formerly psi)	kPa	6.894757	
	lbf/ft2	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	

<sup>\*</sup> Exact conversion factors

Note: The information contained in this table is intended to familiarize readers with commonly used International System of Units (SI) units and provide a quick reference to aid understanding of documents containing SI units. The conversion factors listed here 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, "Preferred Metric Units for General Use by the Federal Government," and International Commission on Radiation Units and Measurements, ICRU Report 33, "Radiation Quantities and Units," issued 1980.

#### APPENDIX A

# 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 www.nrc.gov/info-finder/reactors/ano1.html	IV	PWR-DRYAMB B&W LLP BECH BECH	2,568	12/06/1968 05/21/1974 12/19/1974 06/20/2001 05/20/2034	99 90 87 102 56 98
Arkansas Nuclear One, Unit 2 Entergy Operations, Inc. London, AR (6 miles NW of Russellville, AR) 05000368 www.nrc.gov/info-finder/reactors/ano2.html	IV	PWR-DRYAMB CE BECH BECH	3,026	12/06/1972 09/01/1978 03/26/1980 06/30/2005 07/17/2038	90 97 90 93 91 85
Beaver Valley Power Station, Unit 1 FirstEnergy Nuclear Operating Co. Shippingport, PA (17 miles W of McCandless, PA) 05000334 www.nrc.gov/info-finder/reactors/bv1.html	I	PWR-DRYAMB WEST 3LP S&W S&W	2,900	06/26/1970 07/02/1976 10/01/1976 11/05/2009 01/29/2036	92 91 101 92 86 86
Beaver Valley Power Station, Unit 2 FirstEnergy Nuclear Operating Co. Shippingport, PA (17 miles W of McCandless, PA) 05000412 www.nrc.gov/info-finder/reactors/bv2.html	I	PWR-DRYAMB WEST 3LP S&W S&W	2,900	05/03/1974 08/14/1987 11/17/1987 11/05/2009 05/27/2047	87 84 102 91 97 98
Braidwood Station, Unit 1 Exelon Generation Co., LLC Braceville, IL (20 miles SW of Joliet, IL) 05000456 www.nrc.gov/info-finder/reactors/brai1.html	III	PWR-DRYAMB WEST 4LP S&L CWE	3,645	12/31/1975 07/02/1987 07/29/1988 N/A 10/17/2026	95 89 101 91 95 103
Braidwood Station, Unit 2 Exelon Generation Co., LLC Braceville, IL (20 miles SW of Joliet, IL) 05000457 www.nrc.gov/info-finder/reactors/brai2.html	III	PWR-DRYAMB WEST 4LP S&L CWE	3,645	12/31/1975 05/20/1988 10/17/1988 N/A 12/18/2027	93 99 93 93 98 96
Browns Ferry Nuclear Plant, Unit 1 Tennessee Valley Authority Athens (Limestone County), AL (32 miles W of Huntsville, AL) 05000259 www.nrc.gov/info-finder/reactors/bf1.html	II	BWR-MARK 1 GE 4 TVA TVA	3,458	05/10/1967 12/20/1973 08/01/1974 05/04/2006 12/20/2033	94 86 91 88 94 90



#### APPENDIX A

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	II	BWR-MARK 1 GE 4	3,458	05/10/1967 06/28/1974	94 91
Athens (Limestone County), AL		TVA		03/01/1975	80
(32 miles W of Huntsville, AL)		TVA		05/04/2006	99
05000260		1 47 (		06/28/2034	79
www.nrc.gov/info-finder/reactors/bf2.html				00, 20, 200 .	98
Browns Ferry Nuclear Plant, Unit 3	II	BWR-MARK 1	3,458	07/31/1968	95
Tennessee Valley Authority		GE 4		07/02/1976	81
Athens (Limestone County), AL		TVA		03/01/1977	87
(32 miles W of Huntsville, AL)		TVA		05/04/2006	83
05000296				07/02/2036	89 88
www.nrc.gov/info-finder/reactors/bf3.html  Brunswick Steam Electric Plant, Unit 1	II.	BWR-MARK 1	2,923	02/07/1970	98
Duke Energy Progress, Inc.	11	GE 4	2,923	09/08/1976	83
Southport, NC		UE&C		03/18/1977	100
(30 miles S of Wilmington, NC)		BRRT		06/26/2006	77
05000325		Britti		09/08/2036	92
www.nrc.gov/info-finder/reactors/bru1.html				00,00,2000	89
Brunswick Steam Electric Plant, Unit 2	II	BWR-MARK 1	2,923	02/07/1970	80
Duke Energy Progress, Inc.		GE 4		12/27/1974	99
Southport, NC		UE&C		11/03/1975	79
(30 miles S of Wilmington, NC)		BRRT		06/26/2006	98
05000324				12/27/2034	73
www.nrc.gov/info-finder/reactors/bru2.html		DIA/D DDI/AAAD	0.045	10/01/1075	98
Byron Station, Unit 1	Ш	PWR-DRYAMB WEST 4LP	3,645	12/31/1975	94 101
Exelon Generation Co., LLC		S&L		02/14/1985 09/16/1985	88
Byron, IL (17 miles SW of Rockford, IL)		CWE		N/A	88
05000454		OVVL		10/31/2024	96
www.nrc.gov/info-finder/reactors/byro1.html				10/01/2024	97
Byron Station, Unit 2	Ш	PWR-DRYAMB	3,645	12/31/1975	102
Exelon Generation Co., LLC		WEST 4LP		01/30/1987	96
Byron, IL		S&L		08/02/1987	93
(17 miles SW of Rockford, IL)		CWE		N/A	94
05000455				11/06/2026	86
www.nrc.gov/info-finder/reactors/byro2.html			2 - 2 -	0.1/10/1070	94
Callaway Plant	IV	PWR-DRYAMB	3,565	04/16/1976	98
Union Electric Co. Fulton, MO		WEST 4LP BECH		10/18/1984 12/19/1984	86 90
(25 miles NE of Jefferson City, MO)		DANI		03/06/2015	103
05000483		DAM		10/18/2044	77
www.nrc.gov/info-finder/reactors/call.html				10/10/2077	89

### Appendices.

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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 www.nrc.gov/info-finder/reactors/calv1.html	I	PWR-DRYAMB CE BECH BECH	2,737	07/07/1969 07/31/1974 05/08/1975 03/23/2000 07/31/2034	98 90 101 81 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 www.nrc.gov/info-finder/reactors/calv2.html	I	PWR-DRYAMB CE BECH BECH	2,737	07/07/1969 08/13/1976 04/01/1977 03/23/2000 08/13/2036	93 97 92 101 81 100
Catawba Nuclear Station, Unit 1 Duke Energy Carolinas, LLC York, SC (18 miles S of Charlotte, NC) 05000413 www.nrc.gov/info-finder/reactors/cat1.html	II	PWR-ICECND WEST 4LP DUKE DUKE	3,411	08/07/1975 01/17/1985 06/29/1985 12/05/2003 12/05/2043	91 100 89 89 96 86
Catawba Nuclear Station, Unit 2 Duke Energy Carolinas, LLC York, SC (18 miles S of Charlotte, NC) 05000414 www.nrc.gov/info-finder/reactors/cat2.html	II	PWR-ICECND WEST 4LP DUKE DUKE	3,411	08/07/1975 05/15/1986 08/19/1986 12/05/2003 12/05/2043	90 92 101 92 86 100
Clinton Power Station, Unit 1 Exelon Generation Co., LLC Clinton, IL (23 miles SSE of Bloomington, IL) 05000461 www.nrc.gov/info-finder/reactors/clin.html	III	BWR-MARK 3 GE 6 S&L BALD	3,473	02/24/1976 04/17/1987 11/24/1987 N/A 09/29/2026	97 92 93 100 82 97
Columbia Generating Station Energy Northwest Benton County, WA (12 miles NW of Richland, WA) 05000397 www.nrc.gov/info-finder/reactors/wash2.htm	IV nl	BWR-MARK 2 GE 5 B&R BECH	3,486	03/19/1973 04/13/1984 12/13/1984 05/22/2012 12/20/2043	67 95 50 97 80 98
Comanche Peak Nuclear Power Plant, Unit 1 Luminant Generation Co., LLC Glen Rose, TX (40 miles SW of Fort Worth, TX) 05000445 www.nrc.gov/info-finder/reactors/cp1.html	IV	PWR-DRYAMB WEST 4LP G&H BRRT	3,612	12/19/1974 04/17/1990 08/13/1990 N/A 02/08/2030	100 91 91 98 94 85



#### APPENDIX A 🤻

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/reactors/cp2.html	IV	PWR-DRYAMB WEST 4LP BECH BRRT	3,612	12/19/1974 04/06/1993 08/03/1993 N/A 02/02/2033	94 104 92 91 99 93
Cooper Nuclear Station Nebraska Public Power District Brownville, NE (23 miles S of Nebraska City, NE) 05000298 www.nrc.gov/info-finder/reactors/cns.html	IV	BWR-MARK 1 GE 4 B&R B&R	2,419	06/04/1968 01/18/1974 07/01/1974 11/29/2010 01/18/2034	72 100 86 87 97 88
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/reactors/davi.html	III	PWR-DRYAMB B&W RLP BECH B&W	2,817	03/24/1971 04/22/1977 07/31/1978 N/A 04/22/2017	99 66 81 91 95 74
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/reactors/diab1.htm	IV I	PWR-DRYAMB WEST 4LP PG&E PG&E	3,411	4/23/1968 11/02/1984 05/07/1985 N/A 11/02/2024	84 88 100 84 95 87
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/reactors/diab2.htm	IV I	PWR-DRYAMB WEST 4LP PG&E PG&E	3,411	12/09/1970 08/26/1985 03/13/1986 N/A 08/26/2025	84 100 89 97 82 86
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/reactors/cook1.htm	III nl	PWR-ICECND WEST 4LP AEP AEP	3,304	03/25/1969 10/25/1974 08/28/1975 08/30/2005 10/25/2034	3 88 87 104 78 94
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/reactors/cook2.htm	III nl	PWR-ICECND WEST 4LP AEP AEP	3,468	03/25/1969 12/23/1977 07/01/1978 08/30/2005 12/23/2037	87 84 104 91 85 101

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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/reactors/dres2.htm	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/reactors/dres3.htm	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/reactors/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/reactors/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/reactors/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/reactors/ferm2.htm	III I	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/reactors/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

A: The Atomic Energy Commission (AEC) issued a provisional Operating License (OL) on 12/22/1969, allowing commercial operation. The NRC issued a full-term OL on 02/20/1991.



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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 www.nrc.gov/info-finder/reactors/gg1.html	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 www.nrc.gov/info-finder/reactors/rob2.html	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 www.nrc.gov/info-finder/reactors/hope.html	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 www.nrc.gov/info-finder/reactors/ip2.html	I	PWR-DRYAMB WEST 4LP UE&C WDCO	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 www.nrc.gov/info-finder/reactors/ip3.html	I	PWR-DRYAMB WEST 4LP UE&C WDCO	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 www.nrc.gov/info-finder/reactors/fitz.html	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 www.nrc.gov/info-finder/reactors/far1.html	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

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Plant Name, Unit Number Licensee Location Docket Number NRC Web Page Address		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 www.nrc.gov/info-finder/reactors/far2.html	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 www.nrc.gov/info-finder/reactors/lasa1.html	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 www.nrc.gov/info-finder/reactors/lasa2.html	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 www.nrc.gov/info-finder/reactors/lim1.html	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 www.nrc.gov/info-finder/reactors/lim2.html	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 www.nrc.gov/info-finder/reactors/mcg1.htm	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 www.nrc.gov/info-finder/reactors/mcg2.htm	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



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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 www.nrc.gov/info-finder/reactors/mill2.html	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 www.nrc.gov/info-finder/reactors/mill3.html	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 www.nrc.gov/info-finder/reactors/mont.html		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 www.nrc.gov/info-finder/reactors/nmp1.htm	l Il	BWR-MARK 1 GE 2 NIAG S&W	1,850	04/12/1965 12/26/1974 <sup>o</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 www.nrc.gov/info-finder/reactors/nmp2.htm	l il	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
North Anna Power Station, Unit 1 Virginia Electric & Power Co. Mineral (Louisa County), VA (40 miles NW of Richmond, VA) 05000338 www.nrc.gov/info-finder/reactors/na1.html	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

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

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

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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 www.nrc.gov/info-finder/reactors/na2.html	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 www.nrc.gov/info-finder/reactors/oco1.html	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 www.nrc.gov/info-finder/reactors/oco2.html	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 www.nrc.gov/info-finder/reactors/oco3.html	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 www.nrc.gov/info-finder/reactors/oc.html	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 www.nrc.gov/info-finder/reactors/pali.html	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 www.nrc.gov/info-finder/reactors/palo1.htm	IV	PWR-DRYAMB CE 80-2L 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: The AEC issued a provisional OL on 04/09/1969, allowing commercial operation. The NRC issued a full-term OL on 07/02/1991.

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



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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 www.nrc.gov/info-finder/reactors/palo2.htm	IV I	PWR-DRYAMB CE80-2L BECH BECH	3,990	05/25/1976 04/24/1986 09/19/1986 04/21/2011 04/24/2046	83 101 91 90 91 90
Palo Verde Nuclear Generating Station, Unit 3 Arizona Public Service Company Wintersburg, AZ (50 miles W of Phoenix, AZ) 05000530 www.nrc.gov/info-finder/reactors/palo3.htm	IV I	PWR-DRYAMB CE80-2L BECH BECH	3,990	05/25/1976 11/25/1987 01/08/1988 04/21/2011 11/25/2047	83 89 97 88 79 101
Peach Bottom Atomic Power Station, Unit 2 Exelon Generation Co., LLC Delta, PA (17.9 miles S of Lancaster, PA) 05000277 www.nrc.gov/info-finder/reactors/pb2.html	I	BWR-MARK 1 GE 4 BECH BECH	3,514	01/31/1968 10/25/1973 07/05/1974 05/07/2003 08/08/2033	102 92 101 88 100 88
Peach Bottom Atomic Power Station, Unit 3 Exelon Generation Co., LLC Delta, PA (17.9 miles S of Lancaster, PA) 05000278 www.nrc.gov/info-finder/reactors/pb3.html	I	BWR-MARK 1 GE 4 BECH BECH	3,514	01/31/1968 07/02/1974 12/23/1974 05/07/2003 07/02/2034	89 100 90 103 85 103
Perry Nuclear Power Plant, Unit 1 FirstEnergy Nuclear Operating Co. Perry, OH (35 miles NE of Cleveland, OH) 05000440 www.nrc.gov/info-finder/reactors/perr1.html	III	BWR-MARK 3 GE 6 GIL KAIS	3,758	05/03/1977 11/13/1986 11/18/1987 N/A 03/18/2026	67 98 79 92 73 96
Pilgrim Nuclear Power Station Entergy Nuclear Operations, Inc. Plymouth, MA (38 miles SE of Boston, MA) 05000293 www.nrc.gov/info-finder/reactors/pilg.html	I	BWR-MARK 1 GE 3 BECH BECH	2,028	08/26/1968 06/08/1972 12/01/1972 05/29/2012 06/08/2032	90 99 85 98 74 97
Point Beach Nuclear Plant, Unit 1 NextEra Energy Point Beach, LLC Two Rivers, WI (13 miles NW of Manitowoc, WI) 05000266 www.nrc.gov/info-finder/reactors/poin1.htm	III I	PWR-DRYAMB WEST 2LP BECH BECH	1,800	07/19/1967 10/05/1970 12/21/1970 12/22/2005 10/05/2030	98 88 79 100 84 90

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	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt		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/reactors/poin2.html	III	PWR-DRYAMB WEST 2LP BECH BECH	1,800	07/25/1968 03/08/1973 <sup>F</sup> 10/01/1972 12/22/2005 03/08/2033	84 96 67 89 93
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/reactors/prai1.html	III	PWR-DRYAMB WEST 2LP FLUR NSP	1,677	06/25/1968 04/05/1974 <sup>G</sup> 12/16/1973 06/27/2011 08/09/2033	97 96 91 81 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/reactors/prai2.html	III	PWR-DRYAMB WEST 2LP FLUR NSP	1,677	06/25/1968 10/29/1974 12/21/1974 06/27/2011 10/29/2034	75 86 99 74 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/reactors/quad1.htm	III I	BWR-MARK 1 GE 3 S&L UE&C	2,957	02/15/1967 12/14/1972 02/18/1973 10/28/2004 12/14/2032	82 99 92 102 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/reactors/quad2.htm	III I	BWR-MARK 1 GE 3 S&L UE&C	2,957	02/15/1967 12/14/1972 03/10/1973 10/28/2004 12/14/2032	91 92 104 92 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/reactors/rbs1.html	IV	BWR-MARK 3 GE 6 S&W S&W	3,091	03/25/1977 11/20/1985 06/16/1986 N/A 08/29/2025	113 98 90 91 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 🤻

	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 www.nrc.gov/info-finder/reactors/ginn.html	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 www.nrc.gov/info-finder/reactors/stl1.html	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 www.nrc.gov/info-finder/reactors/stl2.html	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 www.nrc.gov/info-finder/reactors/salm1.html	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 www.nrc.gov/info-finder/reactors/salm2.html	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 www.nrc.gov/info-finder/reactors/seab1.html	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 www.nrc.gov/info-finder/reactors/seq1.html	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

### APPENDICES

#### APPENDIX A 🤻

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/reactors/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
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/reactors/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/reactors/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/reactors/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/reactors/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/reactors/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 Susquehanna Nuclear, LLC Berwick, PA (70 miles NE of Harrisburg, PA) 05000387 www.nrc.gov/info-finder/reactors/susq1.htm		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 🤻

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/reactors/susq2.htm		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/reactors/tmi1.html	ı	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/reactors/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/reactors/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/reactors/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/reactors/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/reactors/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

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#### APPENDIX A 🤻

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

### Commercial Nuclear Power Reactors 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 COL Issued Comm. Op. LR Issued Exp. Date	
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 www.nrc.gov/info-finder/reactors/wb/watts	II s-bar.html	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

<sup>\*</sup> Average capacity factor is listed in year order starting with 2009.

Note: Plant names and data are as identified on the license as of August 2015, and the next printed update will be August 2017. Source: NRC, with some data compiled from EIA/DOE.



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

<sup>\*\*\*</sup> Watts Bar Unit 2 is currently performing startup testing, anticipated to begin commercial operation Fall 2016.

#### APPENDIX B

#### **New Nuclear Power Plant Licensing Applications**

Applicant	Docket Number	Туре	Submittal Date	Design	Site	State	Existing Plant?	Date Accepted	Status
			Combi	ined Oper	ating License				
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; Environ- mental 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
			D	esign Cer	tification				
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
				Early Site	Permit				
PSEG Site	05200043	ESP	5/25/10	Not yet announced	PSEG Site	NJ	Yes	8/4/10	Scheduled

Note: Data as of July 2015, and the next printed update will be August 2017.

Withdrawal was requested for Calvert Cliffs, Grand Gulf, Nine Mile Point, Victoria County, and Callaway (COL and ESP). NRC-abbreviated reactor names listed.



#### APPENDIX C

#### 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 05000010	BWR 700	GE	09/28/1959 10/31/1978 2036	SAFSTOR SAFSTOR
GE EVESR Sunol, CA 05000183	Experimental Superheat React 12.5	GE tor	11/12/1963 2/1/1967 4/15/1970 1/1/2019	SAFSTOR Possession-only License Expires 1/2016
GE VBWR (Vallecitos) Sunol, CA 05000018	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

#### 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
Kewaunee Carlton, WI 05000305	PWR 1,772	WEST 2LP	12/21/1973 05/07/2013	SAFSTOR SAFSTOR
			2073	
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	DECON DECON in Progress
			2030	
San Onofre 3 San Clemente, CA 05000362	PWR CE 3,438	CE	11/15/1982 06/12/2013	DECON DECON in Progress
			2030	



#### APPENDIX C

#### 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
Savannah, N.S. Baltimore, MD 05000238	PWR 74	B&W	08/1965 11/1970 12/01/2031	SAFSTOR SAFSTOR
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	DECON DECON in Progress

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

2020

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.

Data as of July 2015. Next publish release date August 2017.



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 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 the Glossary for definitions of decommissioning alternatives (DECON, SAFSTOR).

<sup>(1)</sup> 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.

### **A**PPENDICES

### APPENDIX D 🥞

Unit Utility Location	Con Type MWe per Unit	Canceled 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



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Unit Utility Location	Con Type MWe per Unit	Canceled 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

### <u>Ap</u>pendices,

#### APPENDIX D

Unit Utility Location	Con Type MWe per Unit	Canceled 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 🤻

Unit Utility Location	Con Type MWe per Unit	Canceled 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

### Appendices

#### APPENDIX D 🤻

Unit Utility Location	Con Type MWe per Unit	Canceled 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



#### APPENDIX D @

### Canceled Commercial Nuclear Power Reactors Part 50—Domestic Licensing of Production and Utilization Facilities (continued)

Unit Utility Location	Con Type MWe per Unit	Canceled 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

#### Notes:

Cancelation 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.

Data as of July 2015, and the next printed update will be August 2017.

Withdrawal was requested for Calvert Cliffs, Grand Gulf, Nine Mile Point, Victoria County, and Callaway (COL and ESP). NRC-abbreviated reactor names listed.

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

#### APPENDIX E 🤏



#### **Commercial Nuclear Power Reactors by Parent Company**

Utility	NRC-Abbreviated Reactor Unit Name
AmerenUE www.ameren.com	Callaway*
Arizona Public Service Company www.aps.com	Palo Verde 1, 2, & 3*
DTE Electric Company www.dteenergy.com	Fermi 2
Dominion Generation www.dom.com	Millstone 2 & 3 North Anna 1 & 2 Surry 1 & 2
Duke Energy www.duke-energy.com	Brunswick 1 & 2 Catawba 1 & 2 Harris 1 McGuire 1 & 2 Oconee 1, 2, & 3 Robinson 2
Energy Northwest www.energy-northwest.com	Columbia
Entergy Nuclear Operations, Inc. www.entergy-nuclear.com	Arkansas Nuclear One 1 & 2 FitzPatrick Grand Gulf 1 Indian Point 2 & 3 Palisades Pilgrim 1 River Bend 1 Waterford 3
Exelon Corporation, LLC www.exeloncorp.com	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 www.firstenergycorp.com	Beaver Valley 1 & 2 Davis-Besse Perry 1



#### APPENDIX E 🦃

#### 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 www.fplgroup.com	Duane Arnold Point Beach 1 & 2 Seabrook 1 St. Lucie 1 & 2 Turkey Point 3 & 4
Indiana Michigan Power Company www.indianamichiganpower.com	Cook 1 & 2
Luminant Generation Company, LLC www.luminant.com	Comanche Peak 1 & 2*
Nebraska Public Power District www.nppd.com	Cooper
Northern States Power Company Minnesota doing business as Xcel Energy www.xcelenergy.com	Monticello Prairie Island 1 & 2
Omaha Public Power District www.oppd.com	Fort Calhoun
Pacific Gas & Electric Company www.pge.com	Diablo Canyon 1 & 2*
Talen Energy Corp. www.talenenergy.com	Susquehanna 1 & 2
PSEG Nuclear, LLC www.pseg.com	Hope Creek 1 Salem 1 & 2
South Carolina Electric & Gas Company www.sceg.com	Summer
Southern Nuclear Operating Company www.southerncompany.com	Hatch 1 & 2 Farley 1 & 2 Vogtle 1 & 2
STP Nuclear Operating Company www.stpegs.com	South Texas Project 1 & 2*
Tennessee Valley Authority www.tva.gov	Browns Ferry 1, 2, & 3 Sequoyah 1 & 2 Watts Bar 1
Wolf Creek Nuclear Operating Corporation	Wolf Creek 1*

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

Note: Data as of July 2015, and the next printed update will be August 2017.



www.wcnoc.com

#### APPENDIX F

### Commercial Nuclear Power Reactor Operating Licenses – Issued by Year

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

Note: This 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. Data as of July 2015, and the next printed update will be August 2017.

#### APPENDIX G

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

2013 2015 2017 2020 2021	Indian Point 2 Indian Point 3 Davis-Besse Sequoyah 1 Seguoyah 2	2030	Comanche Peak 1 Monticello Point Beach 1 Robinson 2 Seabrook	_	Calvert Cliffs 1 Cook 1 Cooper Duane Arnold Hatch 1	2042	Farley 2 McGuire 1 Summer Susquehanna 1 Catawba 1
2022 2023	LaSalle 1 LaSalle 2	2031	Dresden 3 Palisades	_	FitzPatrick Oconee 3		Catawba 2 Columbia
2024	Byron 1 Diablo Canyon 1 Grand Gulf 1	2032	Pilgrim Quad Cities 1 Quad Cities 2		Peach Bottom 3 Prairie Island 2 Three Mile Island 1	2044	McGuire 2 St. Lucie 2 Susquehanna 2
	Limerick 1 Waterford 3		Surry 1 Turkey Point 3	2035	Millstone 2 Watts Bar 1	2044	Callaway
2025	Diablo Canyon 2 Fermi 2	2033	Comanche Peak 2	2036	Browns Ferry 3		Palo Verde 1 Wolf Creek 1
2026	River Bend 1 Braidwood 1 Byron 2 Clinton		Fort Calhoun Oconee 1 Oconee 2 Peach Bottom 2 Point Beach 2 Prairie Island 1 Surry 2		Brunswick 1 Calvert Cliffs 2 St. Lucie 1 Salem 1	2046	Nine Mile Point 2 Harris 1 Hope Creek Palo Verde 2
2027	Perry Braidwood 2 South Texas Project 1			2037	Cook 2 Farley 1 Arkansas Nuclear 2	2047	Beaver Valley 2 Palo Verde 3 Vogtle 1
2028 2029	South Texas Project 2 Dresden 2	2034	Turkey Point 4	-	Hatch 2 North Anna 1	2049	
2323	Ginna Limerick 2 Nine Mile Point 1	2004	Browns Ferry 2 Brunswick 2	2040	North Anna 2 Salem 2	-	

Note: This list includes Indian Point 2, which entered timely renewal on Sept. 29, 2013. Limited to reactors licensed to operate. NRC-abbreviated reactor names listed. Data as of July 2015, and the next printed update will be August 2017.



Oyster Creek

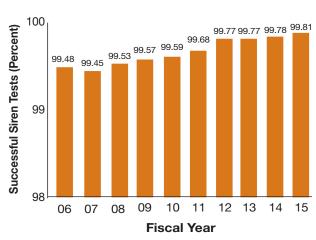
#### APPENDIX H @

### **Industry Performance Indicators: Industry Averages, FYs 2006–2015**

Indicator	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Alert and Notification	99.48	99.45	99.53	99.57	99.59	99.68	99.77	99.77	99.78	99.81
Automatic Scrams	0.32	0.48	0.29	0.36	0.44	0.45	0.30	0.38	0.39	0.38
Collective Radiation Exposure	93	109	96	87	91	90	72	77	70	68
Drill/Exercise Performance	96.06	96.19	96.22	97.06	96.89	97.30	97.51	97.47	97.86	98.21
Equipment-Forced Outage Rate	0.10	0.11	0.08	0.09	0.10	0.09	0.09	0.08	0.10	0.08
ERO Drill Participation	97.89	97.55	98.16	98.65	98.77	99.43	99.33	99.46	99.71	99.84
Forced Outage Rate	1.47	1.41	1.34	2.21	1.74	1.80	2.77	2.98	1.27	1.1
Safety System Actuations	0.22	0.25	0.14	0.23	0.18	0.19	0.17	0.29	0.20	0.15
Safety System Failures	0.60	0.66	0.71	0.71	0.88	0.90	0.85	0.93	0.85	0.92
Significant Events	0.03	0.02	0.03	0.02	0.10	0.13	0.10	0.07	0.03	0.01

Note: Data as of July 2015, and the next printed update will be August 2017.

#### 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.

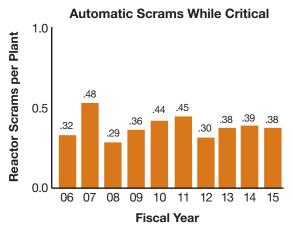
Note: Data represents annual industry averages for operating reactors. The data is continuously updated to incorporate recent information and any subsequent changes in the analysis.

Source: Licensee data as compiled by the NRC



## APPENDIX H 🤻

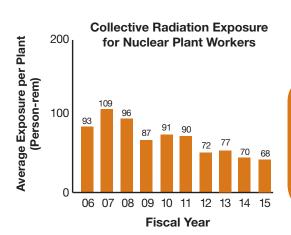
# Industry Performance Indicators: Industry Averages, FYs 2006–2015 (continued)



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



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

### Further Explanation:

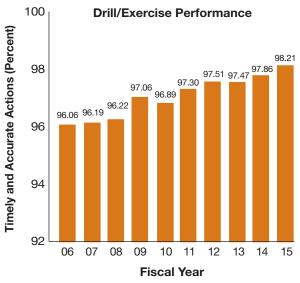
In 2015, those workers receiving a measurable dose of radiation received an average of about 0.1 rem. For comparison purposes, the average U.S. citizen receives 0.3 rem of radiation each year from natural sources (i.e., the everyday environment). See the definition of "exposure" in the Glossary.

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.



### APPENDIX H

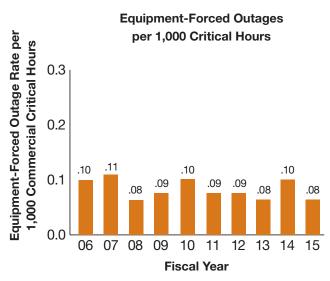
# Industry Performance Indicators: Industry Averages, FYs 2006–2015 (continued)



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



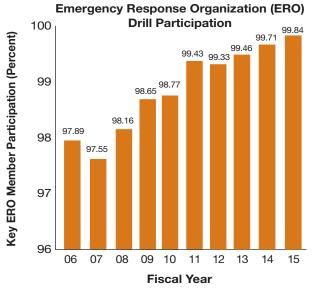
This indicator is the number of times the plant is forced to shut down because of equipment failures for every 1,000 hours that the plant is in operation and transmitting electricity.

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.



### APPENDIX H

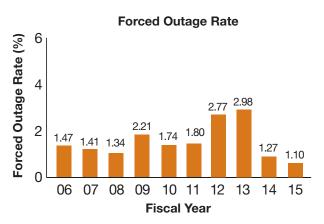
# Industry Performance Indicators: Industry Averages, FYs 2006–2015 (continued)



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



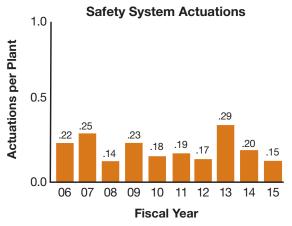
The forced outage rate is the number of hours that the plant is unable to operate (forced outage hours) divided by the sum of the hours that the plant is generating and transmitting electricity (unit service hours) and the hours that the plant is unable to operate (forced outage hours).

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.



## APPENDIX H 🥞

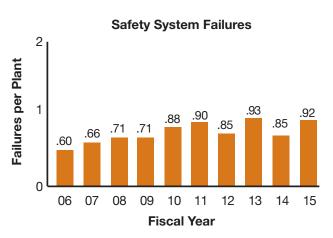
# Industry Performance Indicators: Industry Averages, FYs 2006–2015 (continued)



Safety system actuations are certain manual or automatic actions taken to start emergency core cooling systems or emergency power systems. These systems are specifically designed to either remove heat from the reactor fuel rods if the normal core cooling system fails or to provide emergency electrical power if the normal electrical systems fail.

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



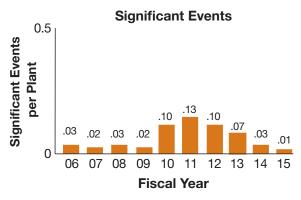
Safety system failures are any actual failures, events, or conditions that could prevent a system from performing its required safety function.

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.



## APPENDIX H 🤻

# Industry Performance Indicators: Industry Averages, FYs 2006–2015 (continued)



Significant events are events that meet specific NRC criteria—for example, degradation of safety equipment, a sudden reactor shutdown with complications, or an unexpected response to a sudden degradation of fuel or pressure boundaries. The NRC staff identifies significant events through detailed screening and evaluation of operating experience.

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.

# APPENDIX I 🤏

## Operating Nuclear Research and Test Reactors Regulated by the NRC

Licensee	Reactor Type OL Issued	Power Level	Licensee Number
Location		(kW)	Docket Number
Aerotest*	TRIGA (Indus)	250	R-98
San Ramon, CA	07/02/1965		05000228
Armed Forces Radiobiology Research Institute Bethesda, MD	TRIGA 06/26/1962	1,100	R-84 05000170
Dow Chemical Company	TRIGA	300	R-108
Midland, MI	07/03/1967		05000264
GE-Hitachi	Tank	100	R-33
Sunol, CA	10/31/1957		05000073
Idaho State University	AGN-201 #103	0.005	R-110
Pocatello, ID	10/11/1967		05000284
Kansas State University	TRIGA	250	R-88
Manhattan, KS	10/16/1962		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	Pool	500	R-75
Columbus, OH	02/24/1961		05000150
Oregon State University	TRIGA Mark II	1,100	R-106
Corvallis, OR	03/07/1967		05000243
Pennsylvania State University	TRIGA	1,100	R-2
State College, PA	07/08/1955		05000005
Purdue University	Lockheed	1	R-87
West Lafayette, IN	08/16/1962		05000182
Reed College	TRIGA Mark I	250	R-112
Portland, OR	07/02/1968		05000288

<sup>\*</sup> Permanent shutdown ordered July 24, 2013.



## **APPENDIX I**

# Operating Nuclear Research and Test Reactors Regulated by the NRC (continued)

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

Note: Data as of July 2015, and the next printed update will be August 2017.



## APPENDIX J

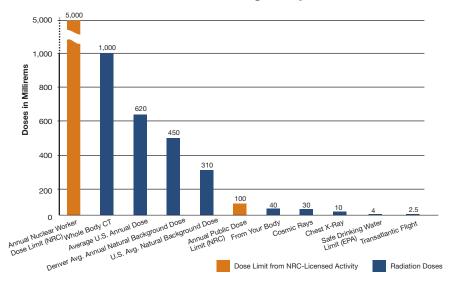
## Nuclear Research and Test Reactors under Decommissioning Regulated by the NRC

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

<sup>\*</sup> License terminated as of August 1, 2016.

Note: Data as of July 2015, and the next printed update will be August 2017.

APPENDIX K
Radiation Doses and Regulatory Limits



## APPENDIX L

## **Materials Licenses by State**

	Number of Licenses			
	Agreement			
State	NRC	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		

	Number of Licenses			
		Agreement		
State	NRC	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				

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

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. Data as of July 2015. Next publish release date August 2017.

The NRC licenses Federal agencies in Agreement States.

## APPENDIX M 🤻

## Major U.S. Fuel Cycle Facility Sites

Licensee	Location	Status	Docket #
Uranium Hexafluoride Conversion Facility			
Honeywell International, Inc.	Metropolis, IL	active	04003392
Uranium Fuel Fabrication Facilities			
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, Inc.	Richland, WA	active	07001257
Mixed Oxide Fuel Fabrication Facility			
Shaw AREVA MOX Services, LLC	Aiken, SC	under construction (operating license under review)	07003098
Gaseous Diffusion Uranium Enrichment Facilit	ties		
USEC, United States Enrichment Corp. Paducah Gaseous Diffusion Plant	Paducah, KY	shut down, certificate termination pending	07007001
Gas Centrifuge Uranium Enrichment Facilities	s		
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
Laser Separation Enrichment Facility			
GE-Hitachi	Wilmington, NC	license issued, construction not started	07007016
Uranium Hexafluoride Deconversion Facility	у		
International Isotopes	Hobbs, NM (Lea County)	license issued, construction not started	04009086

<sup>\*</sup> Operating and producing enriched uranium while undergoing further phases of construction. Note: Data as of July 2015, and the next printed update will be August 2017.

## APPENDIX N

# Dry Spent Fuel Storage Designs: NRC-Approved for Use by General Licensees

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

Note: Data as of July 2015, and the next printed update will be August 2017. (See latest list on the NRC Web site at www.nrc.gov/waste/spent-fuel-storage/designs.html.)

## **APPENDIX O**

## **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 <sup>™</sup>	07200043 W74
Braidwood Exelon Generation Co., LLC	GL	Holtec International	HI-STORM 100	07200073
Browns Ferry Tennessee Valley Authorit	GL	Holtec International	HI-STORM 100S	07200052
Brunswick Carolina Power Co.	GL	Transnuclear, Inc.	NUHOMS®-HD-61BTH	07200006
Byron Exelon Generation Co., L	GL LC	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, L	GL LC	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 D	GL District	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

# Appendices.

## APPENDIX O

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

Name Licensee	License Type	Vendor	Storage Model	Docket Number
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 C	Transnuclear, Inc.	NUHOMS®-61BT	07200065



## **APPENDIX O**

## **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	SL	Transnuclear, Inc.	NUHOMS®-24P	07200004
Duke Energy Company	GL	Transnuclear, Inc.	NUHOMS®-24P	07200040
Oyster Creek AmerGen Energy Company, LLC.	GL	Transnuclear, Inc.	NUHOMS®-61BT	07200015
Palisades Entergy Nuclear Operations, Inc.	GL	EnergySolutions, 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	EnergySolutions, 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

# Appendices

## APPENDIX O

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

Name Licensee	License Type	Vendor	Storage Model	Docket Number
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 GL	General Nuclear Systems, Inc. Transnuclear, Inc. General Nuclear Westinghouse, Inc. Transnuclear, Inc.	CASTOR V/21 TN-32 NAC-128 CASTOR X/33 MC-10 NUHOMS®HD32PTH	07200002 07200055
Susquehanna Susquehanna Nuclear, LLC	GL	Transnuclear, Inc.	NUHOMS®-52B NUHOMS®-61BT NUHOMS®-61BTH	07200033
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 Solutions, LLC	GL	NAC International, Inc.	Magnastor	07201037

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

Note: NRC-abbreviated unit names. Data as of July 2015, and the next printed update will be August 2017.



## APPENDIX P 🥞

## 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 Radioactive 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

Note: Data as of July 2015, and the next printed update will be August 2017.



<sup>\*</sup> Site of an active low-level waste disposal facility.

## APPENDIX Q

## NRC-Regulated Complex Material Sites Undergoing Decommissioning, 2015



NRC-regulated complex material sites (13)

Company	Location
Alameda Naval Air Station	Alameda, CA
Babcock & Wilcox SLDA	Vandergrift, PA
Beltsville Agricultural Research Center	Beltsville, MD
Cimarron Environmental Trust	Cimarron, OK
Department of Army, Jefferson Proving Ground	Madison, IN
Department of Army, Picatinny Arsenal (ARDEC)	Picatinny, NJ
FMRI, Inc. (Fansteel)	Muskogee, OK
Hunter's Point Naval Shipyard	San Francisco, CA
McClellan Air Force Base	Sacramento, CA
Sigma Aldrich	Maryland Heights, MO
UNC Naval Products	New Haven, CT
West Valley Demonstration Project	West Valley, NY
Westinghouse Electric Corporation—Hematite	Festus, MO

Note: Data as of July 2016. Next publish release date August 2017 Picatinny Arsenal in New Jersey is managed by Region I.

### APPENDIX R @

## **Nuclear Power Units by Nation**

0

2

1

3

2

34

4

1

2

7

10

1.330

482

690

1.300

24,654

1.814

688

1,860

7,121

9.470

9.312

3,874

4.610

10,754

169,049

14.420

6.061

14,749

54,832

62,270

Country

Argentina

Armenia

Belarus

Belgium

Bulgaria

Canada

Czech Republic

China

Finland

France

India

Iran

Italy

Japan

Kazakhstan

Rep. Korea

Netherlands

Lithuania

Mexico

Pakistan

Romania

Russia

Slovakia

Slovenia

Spain

Sweden

South Africa

Germany Hungary

Brazil

In Operation or on Order **Nuclear Power** Number Capacity Number Capacity of Units Net MWe Shutdown Production GWh\* of Units Net MWe 5,257 3 1,625 25 0 **1**P 2.266 1 376 0 2 0 0 0 2.218 0 7 1<sup>P</sup> 33,093 5,927 0 0 2 1 1.245 0 15,385 1,884 2 4<sup>P</sup> 15.014 1.926 0 100,921 19 6<sup>P</sup> 13.500 0 0 27 24 23.738 0 130,580 23.025 28.636 6 3.904 0 Λ 0 22.654 4 2.752 1 1.600 0 58 12<sup>P</sup> 415,900 63,130 1,600 91,783 9 12,074 0 27<sup>P</sup> 14.778 4 1.889 0 0 21 6 0 33,231 5,308 3,990 4,140 1 915 0 0 0 **4**P 0 0 0 0 0 43 40,290 2.650 11P&1L **1**P 0 0 0 0 149,165 24 21,667 4 5,420 0

0

0

0

2

0

9

2

0

0

0

0

**Under Construction** 

2P

0

1P

0

0

5<sup>P</sup>

3<sup>P</sup>

O

0

14

3P

0

0

630

7,371

880

0

## APPENDIX R

## **Nuclear Power Units by Nation (continued)**

	In Operation			or on Order			
Country	Nuclear Power Production GWh*	Number of Units	Capacity Net MWe	Number of Units	Capacity Net MWe	Shutdown	
Switzerland	26,370	5	3,333	0	0	<b>1</b> P	
Ukraine	83,123	15	13,107	2	1,900	4 <sup>P</sup>	
United Arab Emirate	s 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>	
Total	2,410,373*	438	379,261	67	65,482	150° & 2 <sup>∟</sup>	

<sup>\*</sup> Annual electrical power production for 2014. Total includes information on Taiwan.

Note: Totals include reactors that are 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. Data as of July 2015, and the next printed update will be August 2017.

## APPENDIX S

## Nuclear Power Units by Reactor Type, Worldwide

In Operation

Under Construction

	Number	
Reactor Type	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 (LWGF	R) 15	10,219
Gas-cooled reactors, all types (GCR)	15	8,175
Liquid-metal-cooled fast breeder reactors (FBR)	2	580
Total	438	379,261

Note: MWe values rounded to the nearest whole number.

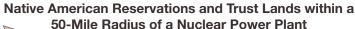
Source: IAEA Power Reactor Information System Database, www.iaea.org

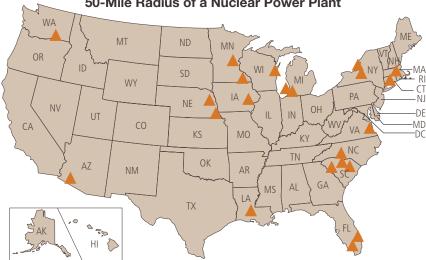
Compiled by the NRC from data as of April 2015. Next publish release date August 2017.

P = Permanent Shutdown

L = Long-Term Shutdown

### APPENDIX T





#### ARIZONA

#### Palo Verde

Ak-Chin Indian Community Tohono O'odham Trust Land Gila River Reservation

#### CONNECTICUT

#### Millstone

Mohegan Reservation Mashantucket Pequot Reservation

Narragansett Reservation

## Shinnecock Indian Nation

## FI.ORIDA

#### St. Lucie

Brighton Reservation (Seminole Tribes of Florida)

Fort Pierce Reservation

#### **Turkey Point**

Hollywood Reservation (Seminole Tribes of Florida)

Miccosukee Reservation Miccosukee 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

#### Pilarim

Wampanoag Tribe of Gay Head

(Aguinnah) Trust Land

#### MICHIGAN

#### **Palisades**

Pottawatomi Reservation Matchebenashshewish Rand

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 Iowa Trust Land Kickapoo

#### Fort Calhoun

Omaha Reservation Winnebago Reservation Winnebago Trust Land

#### **NEW YORK**

FitzPatrick

Onondaga Reservation Oneida Reservation

#### Nine Mile Point

Onondaga Reservation Oneida Reservation

#### NORTH CAROLINA

#### McGuire

Catawba Reservation

#### SOUTH CAROLINA

#### Catawba

Catawba Reservation

#### Oconee

Eastern Cherokee Reservation

#### Summer

Catawba Reservation

#### Virginia

#### Surry

Pamunkev Reservation

#### WASHINGTON

#### Columbia

Yakama Reservation Yakama Trust Land

#### WISCONSIN

#### Point Reach

Oneida Trust Land Oneida Reservation

NRC-abbreviated reactor names listed. Data as of July 2015, and the next printed update will be August 2017.



<sup>\*</sup> Tribe is located within the 10-mile emergency preparedness zone of operating reactors.

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.

## APPENDIX U 🤏

## **Regulatory Research Cooperative Agreements and Grants**

American Nuclear Society	Support for the development and maintenance of probabilistic risk assessment (PRA)-related standards
American Society of Mechanical Engineers	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
Electric Power Research Institute	Research on irradiation-assisted stress-corrosion cracking and irradiation-assisted degradation of vessel internals materials
International Commission on Radiological Protection	Research on radiological protection standards
Kansas State University	Development of a High-Fidelity Model with Depleted Fuel for the Kansas State TRIGA Mark II Reactor
National Academy of Sciences	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
National Council on Radiation Protection and Measurements Inc.	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
Northwestern University	Service Lifetime Extension of Nuclear Power Plants: Prediction of Concrete Aging and Deterioration Through Accelerated Tests, Nondestructive Evaluation, and Stochastic Multiscale Computations
Ohio State University	Severe Accident Management Guidelines (SAMG) Validation within the Context of Severe Accident Uncertainties
Pennsylvania State University	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
Purdue University	Steel Plate Composite Walls: Behavior, Analysis, and Design for Missile Impact
Texas A&M University	Research on bypass flow in prismatic reactor blocks and prolonged station blackout conditions
The Regents of the University of Colorado	Experimental and Numerical Investigation of Alkali Silica Reaction in Nuclear Reactors
University of California, Los Angeles	Methodological and Software Enhancements of Dynamic PRA Platforms for Event Assessment Applications
University of California-Berkeley	Work on ground motion prediction models for central and eastern North America and postliquefaction residual strength
University of Florida	Synergistic Effect of Thermal Aging and Low-Dose Irradiation on the Cast Stainless Steels and Stainless Steel Welds
University of Illinois	Validation of the PARCS/PATHS/SCALE for PWR Depletion Using the BEAVRS Benchmark
University of Maryland	Study of the Implications of Multi-Unit Accidents in the Context of NRC's Quantitative Health Objectives
University of Michigan	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
University of Tennessee	Research on seismic hazards and associated ground motion for the East Tennessee Seismic Zone
	Research to develop a tool to confirm safety margins for modular



## APPENDIX V 🤻

## **Significant Enforcement Actions Issued**

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	Туре	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	NOV/CP SL II - \$11,200 (CP
			07/31/2014	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, MO	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 V 🥞

## **Significant Enforcement Actions Issued (continued)**

Action #	Name	Туре	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
Problem SL III	Agreement State-Illinois GeoLog Well Services, Inc.	Materials	6/11/13	NOV SL III
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, MO	Materials	08/19/2014	NOV SL III
EA-14-108	Diagnostic Imaging Centers, PA	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 V 🥞

## **Significant Enforcement Actions Issued (continued)**

Action #	Name	Туре	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.

Note: Data as of July 2015, and the next printed update will be August 2017.

## APPENDIX W 🥞

## 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.
- 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
- Low-Level Radioactive Waste Policy Amendments Act of 1985
- Uranium Mill Tailings Radiation Control Act of 1978

#### Nonproliferation

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 X 🦃

#### International Activities

# CONVENTIONS AND TREATIES PERTAINING TO NUCLEAR SAFETY, SECURITY, AND INTERNATIONAL SAFEGAURDS\*

- 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
- Treaty for the Prohibition of Nuclear Weapons in Latin America (Tlatelolco Treaty), entry into force for each government individually, United States is a party to the specific protocols appended to the Treaty
- 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 United States is only bound by specific protocols
- 4. Convention on Early Notification of a Nuclear Accident, entry into force October 27, 1986, United States is a party
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, entry into force February 26, 1987, U.S. is a party
- 6. Convention on Nuclear Safety, entry into force October 24, 1996, U.S. is a party
- 7. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, entry into force June 18, 2001, U.S. is a party
- 8. Convention on the Physical Protection of Nuclear Material (CPPNM), entry into force February 8, 1987, U.S. is a party
- 9. Amendment to the CPPNM, entry into force May 8, 2016, U.S. is a party
- 10. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, entry into force August 30, 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)
- 11. Convention on Supplementary Compensation for Nuclear Damage
- Agreement between the United States of America and the Agency for the Application of Safeguards in the United States of America (INFCIRC/288), entry into force December 9, 1980
- Model Protocol Additional to the Agreement Between State(s) and the IAEA for the Application of Safeguards in Connection with the Treaty for the Prohibition of Nuclear Weapons in Latin America (INFCIRC/366), entry into force April 6, 1989, U.S. is a party
- Protocol Additional to the Agreement between the United States of America and the Agency for the Application of Safeguards in the United States of America (INFCIRC/288/Add. 1), entry into force January 6, 2009

Note: Data as of July 2015, and the next printed update will be August 2017.



<sup>\*</sup> This excludes arms control agreements.

## APPENDIX Y 🥞

#### International Activities

#### 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)**

- 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 on 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 Science
  - Working Party on Nuclear Emergency Matters



## APPENDIX Y

### **International Activities**

#### LIST OF THE NRC'S PARTICIPATION WITH MULTILATERAL ORGANIZATIONS (CONTINUED)

- Committee on the Safety of Nuclear Installations (CSNI)
  - · CSNI Program Review Group
  - · Working Group on Integrity and Ageing 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

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. Data as of July 2015, and the next printed update will be August 2017.

EURATOM-The European Atomic Energy Community

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

## APPENDIX Z 🥞



#### LIST OF IMPORT AND EXPORT LICENSES

List of NRC Import and Export Licenses by Applicant and Docket Number issued can now be found at the Dataset Index Web page online at: http://www.nrc.gov/reading-rm/doc-collections/datasets