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APPENDICES

Abbreviations

ABWR	Advanced Boiling-Water Reactor	DOE	Department of Energy (U.S.)
ac	alternating current	DOT	Department of Transportation (U.S.)
ACMUI	Advisory Committee on the Medical Uses of Isotopes	DUKE	Duke Power Company
ACRS	Advisory Committee on Reactor Safeguards	EDO	Executive Director for Operations
ADAMS	Agencywide Documents Access and Management System	EBSO	Ebasco
ADR	alternative dispute resolution	EIA	Energy Information Administration (DOE)
AEC	Atomic Energy Commission (U.S.)	EPA	Environmental Protection Agency (U.S.)
AEP	American Electric Power Company	EPZ	emergency planning zone
AGN	Aerojet-General Nucleonics	ESBWR	Economic Simplified Boiling-Water Reactor
AP1000	Advanced Passive 1000 Megawatt (Westinghouse pressurized-water reactor)	ESP	early site permit
AP600	Advanced Passive 600 Megawatt (Westinghouse pressurized-water reactor)	EVESR	ESADA (Empire States Atomic Development Associates) Vallecitos Experimental Superheat Reactor
APR1400	Advanced Power Reactor	Exp. Date	expiration date of operating license
ASLB	Atomic Safety and Licensing Board	FDA	Food and Drug Administration
AFT	accident tolerant fuel	FEMA	Federal Emergency Management Agency
B&W	Babcock & Wilcox	FERC	Federal Energy Regulatory Commission
BALD	Baldwin Associates	FLEX	divers and flexible coping strategies
BECH	Bechtel	FLUR	Fluor Pioneer
BRRT	Brown & Root	FOIA	Freedom of Information Act
BWR	boiling-water reactor	FR	<i>Federal Register</i>
CE	Combustion Engineering	FTE	full-time equivalent
CFR	<i>Code of Federal Regulations</i>	FW	Foster Wheeler
COL	combined license	FY	fiscal year
Comm. Op.	date of commercial operation	G&H	Gibbs & Hill
Con Type	containment type	GA	General Atomics
	DRYAMB dry, ambient pressure	GE	General Electric
	DRYSUB dry, subatmospheric	GEH	General Electric-Hitachi Nuclear Energy
	ICECND wet, ice condenser	GEIS	generic environmental impact statement
	MARK 1 wet, MARK I	GETR	General Electric Test Reactor
	MARK 2 wet, MARK II	GIL	Gilbert Associates
	MARK 3 wet, MARK III	GL	general license
CP	construction permit	GPC	Georgia Power Company
CP	civil penalty	HLW	high-level radioactive waste
CP Issued	date of construction permit issuance	HTG	high-temperature gas (reactor)
CT	computerized tomography	HWR	heavy-water reactor
CVTR	Carolinas Virginia Tube Reactor	IAEA	International Atomic Energy Agency
CWE	Commonwealth Edison Company	INES	International Nuclear Event Scale
DANI	Daniel International	ISFSI	independent spent fuel storage installation
DBDB	Duke & Bechtel	KAIS	Kaiser Engineers
DBT	design-basis threat	KI	potassium iodide
DC	design certification		
DECON	decontamination		
DHS	Department of Homeland Security (U.S.)		
DI&C	digital instrumentation and control		

Abbreviations (continued)

kW	kilowatt(s)	PG&E	Pacific Gas & Electric Company
kWh	kilowatt-hour(s)	PRA	probabilistic risk assessment
LLP	B&W lowered loop	PRIS	Power Reactor Information System
LLW	low-level radioactive waste	PSDAR	post-shutdown decommissioning activities report
LM	Legacy Management	PSEG	Public Service Electric and Gas Company
LMFB	liquid metal fast breeder (reactor)	PWR	pressurized-water reactor
LOCA	loss-of-coolant accident	rad	radiation absorbed dose
LR Issued	license renewal issued	RDD	radiological dispersal device
LSN	Licensing Support Network	RLP	B&W raised loop
LTP	license termination plan	ROP	Reactor Oversight Process
Mo-99	molybdenum-99	RSS	Really Simple Syndication
MOU	memorandum of understanding	RTR	research and test reactor
MOX	mixed oxide	S&L	Sargent & Lundy
MWe	megawatt(s) electric	S&W	Stone & Webster
MWt	megawatt(s) thermal	SAFSTOR	safe storage
NARM	naturally occurring or accelerator-produced radioactive material	SCF	sodium-cooled fast (reactor)
NEA	Nuclear Energy Agency	SHINE	SHINE Medical Technologies, LLC
NEIMA	Nuclear Energy Innovation and Modernization Act	SL	severity level
NEPA	National Environmental Policy Act	SL	site-specific license
NINA	Nuclear Innovation North America	SMR	small modular reactor
NMMSS	Nuclear Materials Management and Safeguards System	SR	subsequent license renewal
NNSA	National Nuclear Security Administration	SSI	Southern Services Incorporated
NOV	notice of violation	STP	South Texas Project
NPUF	nonpower production and utilization facility	TMI-2	Three Mile Island, Unit 2
NRC	Nuclear Regulatory Commission (U.S.)	TRIGA	Training Reactor and Isotopes Production, General Atomics
NS	Nuclear Ship	TVA	Tennessee Valley Authority
NSP	Northern States Power Company	UE&C	United Engineers & Constructors
NSSS	nuclear steam system supplier and design type	UF₆	uranium hexafluoride
	GE 2 GE Type 2	U-235	uranium-235
	GE 3 GE Type 3	UO₂	uranium dioxide
	GE 4 GE Type 4	US-APWR	U.S. [version of] Advanced Pressurized-Water Reactor
	GE 5 GE Type 5	U.S. EPR	U.S. [version of] Evolutionary Pressurized-Water Reactor
	GE 6 GE Type 6	VBWR	Vallecitos Boiling-Water Reactor
	WEST 2LP Westinghouse Two-Loop	WEST	Westinghouse Electric
	WEST 3LP Westinghouse Three-Loop	WNA	World Nuclear Association
	WEST 4LP Westinghouse Four-Loop	Y-90	yttrium-90
NSTS	National Source Tracking System		
OECD	Organisation for Economic Co-operation and Development		
OIG	Office of the Inspector General		
OL	operating license		
OL Issued	date of latest full-power operating license		

State and Territory Abbreviations

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

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 MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Arkansas Nuclear One, Unit 1 Entergy Operations, Inc. London, AR (6 miles WNW of Russellville, AR) 05000313 https://www.nrc.gov/info-finder/reactors/ano1.html	IV	PWR-DRYAMB B&W LLP BECH BECH	2,568 833 DPR-51	12/06/1968 05/21/1974 12/19/1974 06/20/2001 N/A 05/20/2034
Arkansas Nuclear One, Unit 2 Entergy Operations, Inc. London, AR (6 miles WNW of Russellville, AR) 05000368 https://www.nrc.gov/info-finder/reactors/ano2.html	IV	PWR-DRYAMB CE BECH BECH	3,026 985 NPF-6	12/06/1972 09/01/1978 03/26/1980 06/30/2005 N/A 07/17/2038
Beaver Valley Power Station, Unit 1 Energy Harbor Nuclear Generation LLC/ Energy Harbor Nuclear Corp. Shippingport, PA (17 miles W of McCandless, PA) 05000334 https://www.nrc.gov/info-finder/reactors/bv1.html	I	PWR-DRYAMB WEST 3LP S&W S&W	2,900 907 DPR-66	06/26/1970 07/02/1976 10/01/1976 11/05/2009 N/A 01/29/2036
Beaver Valley Power Station, Unit 2 Energy Harbor Nuclear Generation LLC/ Energy Harbor Nuclear Corp. Shippingport, PA (17 miles W of McCandless, PA) 05000412 https://www.nrc.gov/info-finder/reactors/bv2.html	I	PWR-DRYAMB WEST 3LP S&W S&W	2,900 901 NPF-73	05/03/1974 08/14/1987 11/17/1987 11/05/2009 N/A 05/27/2047
Braidwood Station, Unit 1 Constellation Energy Generation Co., LLC Braceville, IL (20 miles SSW of Joliet, IL) 05000456 https://www.nrc.gov/info-finder/reactors/brai1.html	III	PWR-DRYAMB WEST 4LP S&L CWE	3,645 1,183 NPF-72	12/31/1975 07/02/1987 07/29/1988 01/27/2016 N/A 10/17/2046
Braidwood Station, Unit 2 Constellation Energy Generation Co., LLC Braceville, IL (20 miles SSW of Joliet, IL) 05000457 https://www.nrc.gov/info-finder/reactors/brai2.html	III	PWR-DRYAMB WEST 4LP S&L CWE	3,645 1,154 NPF-77	12/31/1975 05/20/1988 10/17/1988 01/27/2016 N/A 12/18/2047

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Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Browns Ferry Nuclear Plant, Unit 1 Tennessee Valley Authority Limestone County, AL (10 miles S of Athens, AL) 05000259 https://www.nrc.gov/info-finder/reactors/bf1.html	II	BWR-MARK 1 GE 4 TVA TVA	3,952 1,256 DPR-33	05/10/1967 12/20/1973 08/01/1974 05/04/2006 N/A 12/20/2033
Browns Ferry Nuclear Plant, Unit 2 Tennessee Valley Authority Limestone County, AL (10 miles S of Athens, AL) 05000260 https://www.nrc.gov/info-finder/reactors/bf2.html	II	BWR-MARK 1 GE 4 TVA TVA	3,952 1,259 DPR-52	05/10/1967 06/28/1974 03/01/1975 05/04/2006 N/A 06/28/2034
Browns Ferry Nuclear Plant, Unit 3 Tennessee Valley Authority Limestone County, AL (10 miles S of Athens, AL) 05000296 https://www.nrc.gov/info-finder/reactors/bf3.html	II	BWR-MARK 1 GE 4 TVA TVA	3,952 1,260 DPR-68	07/31/1968 07/02/1976 03/01/1977 05/04/2006 N/A 07/02/2036
Brunswick Steam Electric Plant, Unit 1 Duke Energy Progress, LLC Southport, NC (20 miles S of Wilmington, NC) 05000325 https://www.nrc.gov/info-finder/reactors/bru1.html	II	BWR-MARK 1 GE 4 UE&C BRRT	2,923 938 DPR-71	02/07/1970 09/08/1976 03/18/1977 06/26/2006 N/A 09/08/2036
Brunswick Steam Electric Plant, Unit 2 Duke Energy Progress, LLC Southport, NC (20 miles S of Wilmington, NC) 05000324 https://www.nrc.gov/info-finder/reactors/bru2.html	II	BWR-MARK 1 GE 4 UE&C BRRT	2,923 932 DPR-62	02/07/1970 12/27/1974 11/03/1975 06/26/2006 N/A 12/27/2034
Byron Station, Unit 1 Constellation Energy Generation Co., LLC Byron, IL (17 miles SW of Rockford, IL) 05000454 https://www.nrc.gov/info-finder/reactors/byro1.html	III	PWR-DRYAMB WEST 4LP S&L CWE	3,645 1,164 NPF-37	12/31/1975 02/14/1985 09/16/1985 11/19/2015 N/A 10/31/2044
Byron Station, Unit 2 Constellation Energy Generation Co., LLC Byron, IL (17 miles SW of Rockford, IL) 05000455 https://www.nrc.gov/info-finder/reactors/byro2.html	III	PWR-DRYAMB WEST 4LP S&L CWE	3,645 1,136 NPF-66	12/31/1975 01/30/1987 08/02/1987 11/19/2015 N/A 11/06/2046

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Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Callaway Plant, Unit 1 Union Electric Co. Fulton, MO (25 miles ENE of Jefferson City, MO) 05000483 https://www.nrc.gov/info-finder/reactors/call.html	IV	PWR-DRYAMB WEST 4LP BECH DANI	3,565 1190 NPF-30	04/16/1976 10/18/1984 12/19/1984 03/06/2015 N/A 10/18/2044
Calvert Cliffs Nuclear Power Plant, Unit 1 Calvert Cliffs Nuclear Power Plant, LLC Constellation Energy Generation Co., LLC Lusby, MD (40 miles S of Annapolis, MD) 05000317 https://www.nrc.gov/info-finder/reactors/calv1.html	I	PWR-DRYAMB CE BECH BECH	2,737 866 DPR-53	07/07/1969 07/31/1974 05/08/1975 03/23/2000 N/A 07/31/2034
Calvert Cliffs Nuclear Power Plant, Unit 2 Calvert Cliffs Nuclear Power Plant, LLC Constellation Energy Generation Co., LLC Lusby, MD (40 miles S of Annapolis, MD) 05000318 https://www.nrc.gov/info-finder/reactors/calv2.html	I	PWR-DRYAMB CE BECH BECH	2,737 842 DPR-69	07/07/1969 08/13/1976 04/01/1977 03/23/2000 N/A 08/13/2036
Catawba Nuclear Station, Unit 1 Duke Energy Carolinas, LLC York, SC (18 miles S of Charlotte, NC) 05000413 https://www.nrc.gov/info-finder/reactors/cat1.html	II	PWR-ICECND WEST 4LP DUKE DUKE	3,469 1,160 NPF-35	08/07/1975 01/17/1985 06/29/1985 12/05/2003 N/A 12/05/2043
Catawba Nuclear Station, Unit 2 Duke Energy Carolinas, LLC York, SC (18 miles S of Charlotte, NC) 05000414 https://www.nrc.gov/info-finder/reactors/cat2.html	II	PWR-ICECND WEST 4LP DUKE DUKE	3,411 1,150 NPF-52	08/07/1975 05/15/1986 08/19/1986 12/05/2003 N/A 12/05/2043
Clinton Power Station, Unit 1 Constellation Energy Generation Co., LLC Clinton, IL (23 miles SSE of Bloomington, IL) 05000461 https://www.nrc.gov/info-finder/reactors/clin.html	III	BWR-MARK 3 GE 6 S&L BALD	3,473 1,065 NPF-62	02/24/1976 04/17/1987 11/24/1987 N/A N/A 09/29/2026

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Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Columbia Generating Station Energy Northwest Hanford Reservation in Benton County, WA (15 miles NNW of Richland, WA) 05000397 https://www.nrc.gov/info-finder/reactors/wash2.html	IV	BWR-MARK 2 GE 5 B&R BECH	3,544 1,163 NPF-21	03/19/1973 04/13/1984 12/13/1984 05/22/2012 N/A 12/20/2043
Comanche Peak Nuclear Power Plant, Unit 1 Comanche Peak Power Co., LLC. Vistra Operating Co., LLC Glen Rose, TX (40 miles SW of Fort Worth, TX) 05000445 https://www.nrc.gov/info-finder/reactors/cp1.html	IV	PWR-DRYAMB WEST 4LP G&H BRRT	3,612 1,205 NPF-87	12/19/1974 04/17/1990 08/13/1990 N/A N/A 02/08/2030
Comanche Peak Nuclear Power Plant, Unit 2 Comanche Peak Power Co., LLC. Vistra Operating Co., LLC Glen Rose, TX (40 miles SW of Fort Worth, TX) 05000446 https://www.nrc.gov/info-finder/reactors/cp2.html	IV	PWR-DRYAMB WEST 4LP BECH BRRT	3,612 1,195 NPF-89	12/19/1974 04/06/1993 08/03/1993 N/A N/A 02/02/2033
Cooper Nuclear Station Nebraska Public Power District Brownville, NE (23 miles S of Nebraska City, NE) 05000298 https://www.nrc.gov/info-finder/reactors/cns.html	IV	BWR-MARK 1 GE 4 B&R B&R	2,419 770 DPR-46	06/04/1968 01/18/1974 07/01/1974 11/29/2010 N/A 01/18/2034
Davis-Besse Nuclear Power Station, Unit 1 Energy Harbor Nuclear Generation LLC Energy Harbor Nuclear Corp. Oak Harbor, OH (21 miles ESE of Toledo, OH) 05000346 https://www.nrc.gov/info-finder/reactors/davi.html	III	PWR-DRYAMB B&W RLP BECH B&W	2,817 894 NPF-3	03/24/1971 04/22/1977 07/31/1978 12/08/2015 N/A 04/22/2037
Diablo Canyon Power Plant, Unit 1 Pacific Gas & Electric Co. Avila Beach, CA (12 miles WSW of San Luis Obispo, CA) 05000275 https://www.nrc.gov/info-finder/reactors/diab1.html	IV	PWR-DRYAMB WEST 4LP PG&E PG&E	3,411 1,122 DPR-80	4/23/1968 11/02/1984 05/07/1985 Withdrawn N/A 11/02/2024

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Diablo Canyon Power Plant, Unit 2 Pacific Gas & Electric Co. Avila Beach, CA (12 miles WSW of San Luis Obispo, CA) 05000323 https://www.nrc.gov/info-finder/reactors/diab2.html	IV	PWR-DRYAMB WEST 4LP PG&E PG&E	3,411 1,118 DPR-82	12/09/1970 08/26/1985 03/13/1986 Withdrawn N/A 08/26/2025
Donald C. Cook Nuclear Plant, Unit 1 Indiana Michigan Power Co. Bridgman, MI (13 miles S of Benton Harbor, MI) 05000315 https://www.nrc.gov/info-finder/reactors/cook1.html	III	PWR-ICECND WEST 4LP AEP AEP	3,304 1,009 DPR-58	03/25/1969 10/25/1974 08/28/1975 08/30/2005 N/A 10/25/2034
Donald C. Cook Nuclear Plant, Unit 2 Indiana Michigan Power Co. Bridgman, MI (13 miles S of Benton Harbor, MI) 05000316 https://www.nrc.gov/info-finder/reactors/cook2.html	III	PWR-ICECND WEST 4LP AEP AEP	3,468 1,168 DPR-74	03/25/1969 12/23/1977 07/01/1978 08/30/2005 N/A 12/23/2037
Dresden Nuclear Power Station, Unit 2 Constellation Energy Generation Co., LLC Morris (Grundy County), IL (25 miles SW of Joliet, IL) 05000237 https://www.nrc.gov/info-finder/reactors/dres2.html	III	BWR-MARK 1 GE 3 S&L UE&C	2,957 902 DPR-19	01/10/1966 02/20/1991 ^A 06/09/1970 10/28/2004 N/A 12/22/2029
Dresden Nuclear Power Station, Unit 3 Constellation Energy Generation Co., LLC Morris (Grundy County), IL (25 miles SW of Joliet, IL) 05000249 https://www.nrc.gov/info-finder/reactors/dres3.html	III	BWR-MARK 1 GE 3 S&L UE&C	2,957 895 DPR-25	10/14/1966 01/12/1971 11/16/1971 10/28/2004 N/A 01/12/2031
Edwin I. Hatch Nuclear Plant, Unit 1 Southern Nuclear Operating Co., Inc. Baxley, GA (20 miles S of Vidalia, GA) 05000321 https://www.nrc.gov/info-finder/reactors/hat1.html	II	BWR-MARK 1 GE 4 BECH GPC	2,804 876 DPR-57	09/30/1969 10/13/1974 12/31/1975 01/15/2002 N/A 08/06/2034

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.

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Edwin I. Hatch Nuclear Plant, Unit 2 Southern Nuclear Operating Co., Inc. Baxley, GA (20 miles S of Vidalia, GA) 05000366 https://www.nrc.gov/info-finder/reactors/hat2.html	II	BWR-MARK 1 GE 4 BECH GPC	2,804 883 NPF-5	12/27/1972 06/13/1978 09/05/1979 01/15/2002 N/A 06/13/2038
Fermi, Unit 2 DTE Electric Company Newport, MI (25 miles NE of Toledo, OH) 05000341 https://www.nrc.gov/info-finder/reactors/ferm2.html	III	BWR-MARK 1 GE 4 S&L DANI	3,486 1,141 NPF-43	09/26/1972 03/20/1985 01/23/1988 12/15/2016 N/A 03/20/2045
Grand Gulf Nuclear Station, Unit 1 Entergy Operations, Inc. Port Gibson, MS (20 miles S of Vicksburg, MS) 05000416 https://www.nrc.gov/info-finder/reactors/gg1.html	IV	BWR-MARK 3 GE 6 BECH BECH	4,408 1,401 NPF-29	09/04/1974 11/01/1984 07/01/1985 12/01/2016 N/A 11/01/2044
H.B. Robinson Steam Electric Plant, Unit 2 Duke Energy Progress, LLC Hartsville, SC (26 miles NW of Florence, SC) 05000261 https://www.nrc.gov/info-finder/reactors/rob2.html	II	PWR-DRYAMB WEST 3LP EBSO EBSO	2,339 759 DPR-23	04/13/1967 07/31/1970 03/07/1971 04/19/2004 N/A 07/31/2030
Hope Creek Generating Station, Unit 1 PSEG Nuclear, LLC Hancocks Bridge, NJ (18 miles SE of Wilmington, DE) 05000354 https://www.nrc.gov/info-finder/reactors/hope.html	I	BWR-MARK 1 GE 4 BECH BECH	3,902 1,172 NPF-57	11/04/1974 07/25/1986 12/20/1986 07/20/2011 N/A 04/11/2046
James A. FitzPatrick Nuclear Power Plant Constellation Energy Generation Co., LLC Scriba, NY (6 miles NE of Oswego, NY) 05000333 https://www.nrc.gov/info-finder/reactors/fitz.html	I	BWR-MARK 1 GE 4 S&W S&W	2,536 848 DPR-59	05/20/1970 10/17/1974 07/28/1975 09/08/2008 N/A 10/17/2034

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Joseph M. Farley Nuclear Plant, Unit 1 Southern Nuclear Operating Co., Inc. Columbia, AL (18 miles E of Dothan, AL) 05000348 https://www.nrc.gov/info-finder/reactors/far1.html	II	PWR-DRYAMB WEST 3LP SSI DANI	2,775 874 NPF-2	08/16/1972 06/25/1977 12/01/1977 05/12/2005 N/A 06/25/2037
Joseph M. Farley Nuclear Plant, Unit 2 Southern Nuclear Operating Co., Inc. Columbia, AL (18 miles E of Dothan, AL) 05000364 https://www.nrc.gov/info-finder/reactors/far2.html	II	PWR-DRYAMB WEST 3LP SSI BECH	2,775 877 NPF-8	08/16/1972 03/31/1981 07/30/1981 05/12/2005 N/A 03/31/2041
LaSalle County Station, Unit 1 Constellation Energy Generation Co., LLC Marseilles, IL (11 miles SE of Ottawa, IL) 05000373 https://www.nrc.gov/info-finder/reactors/lasa1.html	III	BWR-MARK 2 GE 5 S&L CWE	3,546 1,131 NPF-11	09/10/1973 04/17/1982 01/01/1984 10/19/2016 N/A 04/17/2042
LaSalle County Station, Unit 2 Constellation Energy Generation Co., LLC Marseilles, IL (11 miles SE of Ottawa, IL) 05000374 https://www.nrc.gov/info-finder/reactors/lasa2.html	III	BWR-MARK 2 GE 5 S&L CWE	3,546 1,134 NPF-18	09/10/1973 12/16/1983 10/19/1984 10/19/2016 N/A 12/16/2043
Limerick Generating Station, Unit 1 Constellation Energy Generation Co., LLC Limerick, PA (21 miles NW of Philadelphia, PA) 05000352 https://www.nrc.gov/info-finder/reactors/lim1.html	I	BWR-MARK 2 GE 4 BECH BECH	3,515 1,120 NPF-39	06/19/1974 08/08/1985 02/01/1986 10/20/2014 N/A 10/26/2044
Limerick Generating Station, Unit 2 Constellation Energy Generation Co., LLC Limerick, PA (21 miles NW of Philadelphia, PA) 05000353 https://www.nrc.gov/info-finder/reactors/lim2.html	I	BWR-MARK 2 GE 4 BECH BECH	3,515 1,122 NPF-85	06/19/1974 08/25/1989 01/08/1990 10/20/2014 N/A 06/22/2049

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
McGuire Nuclear Station, Unit 1 Duke Energy Carolinas, LLC Huntersville, NC (17 miles N of Charlotte, NC) 05000369 https://www.nrc.gov/info-finder/reactors/mcg1.html	II	PWR-ICECND WEST 4LP DUKE DUKE	3,411 1,158 NPF-9	02/23/1973 05/27/1981 12/01/1981 12/05/2003 N/A 06/12/204
McGuire Nuclear Station, Unit 2 Duke Energy Carolinas, LLC Huntersville, NC (17 miles N of Charlotte, NC) 05000370 https://www.nrc.gov/info-finder/reactors/mcg2.html	II	PWR-ICECND WEST 4LP DUKE DUKE	3,411 1,158 NPF-17	02/23/1973 05/27/1983 03/01/1984 12/05/2003 N/A 03/03/2043
Millstone Power Station, Unit 2 Dominion Energy Nuclear Connecticut, Inc. Waterford, CT (3.2 miles WSW of New London, CT) 05000336 https://www.nrc.gov/info-finder/reactors/mill2.html	I	PWR-DRYAMB CE BECH BECH	2,700 853 DPR-65	12/11/1970 09/26/1975 12/26/1975 11/28/2005 N/A 07/31/2035
Millstone Power Station, Unit 3 Dominion Energy Nuclear Connecticut, Inc. Waterford, CT (3.2 miles WSW of New London, CT) 05000423 https://www.nrc.gov/info-finder/reactors/mill3.html	I	PWR-DRYSUB WEST 4LP S&W S&W	3,650 1,220 NPF-49	08/09/1974 01/31/1986 04/23/1986 11/28/2005 N/A 11/25/2045
Monticello Nuclear Generating Plant, Unit 1 Northern States Power Company-Minnesota Monticello, MN (30 miles NW of Minneapolis, MN) 05000263 https://www.nrc.gov/info-finder/reactors/mont.html	III	BWR-MARK 1 GE 3 BECH BECH	2,004 617 DPR-22	06/19/1967 01/09/1981 ^B 06/30/1971 11/08/2006 N/A 09/08/2030
Nine Mile Point Nuclear Station, Unit 1 Nine Mile Point Nuclear Station, LLC Scriba, NY (6 miles NE of Oswego, NY) 05000220 https://www.nrc.gov/info-finder/reactors/nmp1.html	I	BWR-MARK 1 GE 2 NIAG S&W	1,850 621 DPR-63	04/12/1965 12/26/1974 ^C 12/01/1969 10/31/2006 N/A 08/22/2029

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.

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Nine Mile Point Nuclear Station, Unit 2 Nine Mile Point Nuclear Station, LLC Scriba, NY (6 miles NE of Oswego, NY) 05000410 https://www.nrc.gov/info-finder/reactors/nmp2.html	I	BWR-MARK 2 GE 5 S&W S&W	3,988 1,292 NPF-69	06/24/1974 07/02/1987 03/11/1988 10/31/2006 N/A 10/31/2046
North Anna Power Station, Unit 1 Virginia Electric & Power Co. Mineral (Louisa County), VA (40 miles NW of Richmond, VA) 05000338 https://www.nrc.gov/info-finder/reactors/na1.html	II	PWR-DRYSUB WEST 3LP S&W S&W	2,940 948 NPF-4	02/19/1971 04/01/1978 06/06/1978 03/20/2003 N/A 04/01/2038
North Anna Power Station, Unit 2 Virginia Electric & Power Co. Mineral (Louisa County), VA (40 miles NW of Richmond, VA) 05000339 https://www.nrc.gov/info-finder/reactors/na2.html	II	PWR-DRYSUB WEST 3LP S&W S&W	2,940 944 NPF-7	02/19/1971 08/21/1980 12/14/1980 03/20/2003 N/A 08/21/2040
Oconee Nuclear Station, Unit 1 Duke Energy Carolinas, LLC Seneca, SC (30 miles W of Greenville, SC) 05000269 https://www.nrc.gov/info-finder/reactors/oco1.html	II	PWR-DRYAMB B&W LLP DBDB DUKE	2,610 847 DPR-38	11/06/1967 02/06/1973 07/15/1973 05/23/2000 N/A 02/06/2033
Oconee Nuclear Station, Unit 2 Duke Energy Carolinas, LLC Seneca, SC (30 miles W of Greenville, SC) 05000270 https://www.nrc.gov/info-finder/reactors/oco2.html	II	PWR-DRYAMB B&W LLP DBDB DUKE	2,610 848 DPR-47	11/06/1967 10/06/1973 09/09/1974 05/23/2000 N/A 10/06/2033
Oconee Nuclear Station, Unit 3 Duke Energy Carolinas, LLC Seneca, SC (30 miles W of Greenville, SC) 05000287 https://www.nrc.gov/info-finder/reactors/oco3.html	II	PWR-DRYAMB B&W LLP DBDB DUKE	2,610 859 DPR-55	11/06/1967 07/19/1974 12/16/1974 05/23/2000 N/A 07/19/2034
Palo Verde Nuclear Generating Station, Unit 1 Arizona Public Service Company Wintersburg, AZ (50 miles W of Phoenix, AZ) 05000528 https://www.nrc.gov/info-finder/reactors/palo1.html	IV	PWR-DRYAMB CE 80-2L BECH BECH	3,990 1,311 NPF-41	05/25/1976 06/01/1985 01/28/1986 04/21/2011 N/A 06/01/2045

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Palo Verde Nuclear Generating Station, Unit 2 Arizona Public Service Company Wintersburg, AZ (50 miles W of Phoenix, AZ) 05000529 https://www.nrc.gov/info-finder/reactors/palo2.html	IV	PWR-DRYAMB CE 80-2L BECH BECH	3,990 1,314 NPF-51	05/25/1976 04/24/1986 09/19/1986 04/21/2011 N/A 04/24/2046
Palo Verde Nuclear Generating Station, Unit 3 Arizona Public Service Company Wintersburg, AZ (50 miles W of Phoenix, AZ) 05000530 https://www.nrc.gov/info-finder/reactors/palo3.html	IV	PWR-DRYAMB CE 80-2L BECH BECH	3,990 1,312 NPF-74	05/25/1976 11/25/1987 01/08/1988 04/21/2011 N/A 11/25/2047
Peach Bottom Atomic Power Station, Unit 2 Constellation Energy Generation Co., LLC Delta, PA (17.9 miles S of Lancaster, PA) 05000277 https://www.nrc.gov/info-finder/reactors/pb2.html	I	BWR-MARK 1 GE 4 BECH BECH	4,016 1,265 DPR-44	01/31/1968 10/25/1973 07/05/1974 05/07/2003 03/05/2020 08/08/2053
Peach Bottom Atomic Power Station, Unit 3 Constellation Energy Generation Co., LLC Delta, PA (17.9 miles S of Lancaster, PA) 05000278 https://www.nrc.gov/info-finder/reactors/pb3.html	I	BWR-MARK 1 GE 4 BECH BECH	4,016 1,285 DPR-56	01/31/1968 07/02/1974 12/23/1974 05/07/2003 03/05/2020 07/02/2054
Perry Nuclear Power Plant, Unit 1 Energy Harbor Nuclear Generation LLC/ Energy Harbor Nuclear Corp. Perry, OH (35 miles NE of Cleveland, OH) 05000440 https://www.nrc.gov/info-finder/reactors/perr1.html	III	BWR-MARK 3 GE 6 GIL KAIS	3,758 1,240 NPF-58	05/03/1977 11/13/1986 11/18/1987 N/A N/A 03/18/2026
Point Beach Nuclear Plant, Unit 1 NextEra Energy Point Beach, LLC Two Rivers, WI (13 miles NNW of Manitowoc, WI) 05000266 https://www.nrc.gov/info-finder/reactors/poin1.html	III	PWR-DRYAMB WEST 2LP BECH BECH	1,800 598 DPR-24	07/19/1967 10/05/1970 12/21/1970 12/22/2005 N/A 10/05/2030

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Point Beach Nuclear Plant, Unit 2 NextEra Energy Point Beach, LLC Two Rivers, WI (13 miles NNW of Manitowoc, WI) 05000301 https://www.nrc.gov/info-finder/reactors/poin2.html	III	PWR-DRYAMB WEST 2LP BECH BECH	1,800 603 DPR-27	07/25/1968 03/08/1973 ^D 10/01/1972 12/22/2005 N/A 03/08/2033
Prairie Island Nuclear Generating Plant, Unit 1 Northern States Power Co.—Minnesota Welch, MN (28 miles SE of Minneapolis, MN) 05000282 https://www.nrc.gov/info-finder/reactors/prai1.html	III	PWR-DRYAMB WEST 2LP FLUR NSP	1,677 521 DPR-42	06/25/1968 04/05/1974 ^E 12/16/1973 06/27/2011 N/A 08/09/2033
Prairie Island Nuclear Generating Plant, Unit 2 Northern States Power Co.—Minnesota Welch, MN (28 miles SE of Minneapolis, MN) 05000306 https://www.nrc.gov/info-finder/reactors/prai2.html	III	PWR-DRYAMB WEST 2LP FLUR NSP	1,677 519 DPR-60	06/25/1968 10/29/1974 12/21/1974 06/27/2011 N/A 10/29/2034
Quad Cities Nuclear Power Station, Unit 1 Constellation Energy Generation Co., LLC Cordova, IL (20 miles NE of Moline, IL) 05000254 https://www.nrc.gov/info-finder/reactors/quad1.html	III	BWR-MARK 1 GE 3 S&L UE&C	2,957 908 DPR-29	02/15/1967 12/14/1972 02/18/1973 10/28/2004 N/A 12/14/2032
Quad Cities Nuclear Power Station, Unit 2 Constellation Energy Generation Co., LLC Cordova, IL (20 miles NE of Moline, IL) 05000265 https://www.nrc.gov/info-finder/reactors/quad2.html	III	BWR-MARK 1 GE 3 S&L UE&C	2,957 911 DPR-30	02/15/1967 12/14/1972 03/10/1973 10/28/2004 N/A 12/14/2032
R.E. Ginna Nuclear Power Plant R.E. Ginna Nuclear Power Plant, LLC Ontario, NY (20 miles NE of Rochester, NY) 05000244 https://www.nrc.gov/info-finder/reactors/ginn.html	I	PWR-DRYAMB WEST 2LP GIL BECH	1,775 581 DPR-18	04/25/1966 09/19/1969 07/01/1970 05/19/2004 N/A 09/18/2029

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

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

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
River Bend Station, Unit 1 Entergy Operations, Inc. St. Francisville, LA (24 miles NNW of Baton Rouge, LA) 05000458 https://www.nrc.gov/info-finder/reactors/rbs1.html	IV	BWR-MARK 3 GE 6 S&W S&W	3,091 968 NPF-47	03/25/1977 11/20/1985 06/16/1986 12/20/2018 N/A 08/29/2045
St. Lucie Plant, Unit 1 Florida Power & Light Co. Jensen Beach, FL (10 miles SE of Ft. Pierce, FL) 05000335 https://www.nrc.gov/info-finder/reactors/stl1.html	II	PWR-DRYAMB CE EBSO EBSO	3,020 981 DPR-67	07/01/1970 03/01/1976 12/21/1976 10/02/2003 N/A 03/01/2036
St. Lucie Plant, Unit 2 Florida Power & Light Co. Jensen Beach, FL (10 miles SE of Ft. Pierce, FL) 05000389 https://www.nrc.gov/info-finder/reactors/stl2.html	II	PWR-DRYAMB CE EBSO EBSO	3,020 987 NPF-16	05/02/1977 04/06/1983 08/08/1983 10/02/2003 N/A 04/06/2043
Salem Nuclear Generating Station, Unit 1 PSEG Nuclear, LLC Hancocks Bridge, NJ (18 miles SE of Wilmington, DE) 05000272 https://www.nrc.gov/info-finder/reactors/salm1.html	I	PWR-DRYAMB WEST 4LP PSEG UE&C	3,459 1,153 DPR-70	09/25/1968 12/01/1976 06/30/1977 06/30/2011 N/A 08/13/2036
Salem Nuclear Generating Station, Unit 2 PSEG Nuclear, LLC Hancocks Bridge, NJ (18 miles SE of Wilmington, DE) 05000311 https://www.nrc.gov/info-finder/reactors/salm2.html	I	PWR-DRYAMB WEST 4LP PSEG UE&C	3,459 1,142 DPR-75	09/25/1968 05/20/1981 10/13/1981 06/30/2011 N/A 04/18/2040
Seabrook Station, Unit 1 NextEra Energy Seabrook, LLC Seabrook, NH (13 miles S of Portsmouth, NH) 05000443 https://www.nrc.gov/info-finder/reactors/seab1.html	I	PWR-DRYAMB WEST 4LP UE&C UE&C	3,648 1,250 NPF-86	07/07/1976 03/15/1990 08/19/1990 03/12/2019 N/A 03/15/2050

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Sequoyah Nuclear Plant, Unit 1 Tennessee Valley Authority Soddy-Daisy, TN (16 miles NE of Chattanooga, TN) 05000327 https://www.nrc.gov/info-finder/reactors/seq1.html	II	PWR-ICECND WEST 4LP TVA TVA	3,455 1,152 DPR-77	05/27/1970 09/17/1980 07/01/1981 09/24/2015 N/A 09/17/2040
Sequoyah Nuclear Plant, Unit 2 Tennessee Valley Authority Soddy-Daisy, TN (16 miles NE of Chattanooga, TN) 05000328 https://www.nrc.gov/info-finder/reactors/seq2.html	II	PWR-ICECND WEST 4LP TVA TVA	3,455 1,126 DPR-79	05/27/1970 09/15/1981 06/01/1982 09/28/2015 N/A 09/15/2041
Shearon Harris Nuclear Power Plant, Unit 1 Duke Energy Progress, Inc. New Hill, NC (20 miles SW of Raleigh, NC) 05000400 https://www.nrc.gov/info-finder/reactors/har1.html	II	PWR-DRYAMB WEST 3LP EBSO DANI	2,948 964 NPF-63	01/27/1978 10/24/1986 05/02/1987 12/17/2008 N/A 10/24/2046
South Texas Project, Unit 1 STP Nuclear Operating Co. Bay City, TX (90 miles SW of Houston, TX) 05000498 https://www.nrc.gov/info-finder/reactors/stp1.html	IV	PWR-DRYAMB WEST 4LP BECH EBSO	3,853 1,280 NPF-76	12/22/1975 03/22/1988 08/25/1988 09/28/2017 N/A 08/20/2047
South Texas Project, Unit 2 STP Nuclear Operating Co. Bay City, TX (90 miles SW of Houston, TX) 05000499 https://www.nrc.gov/info-finder/reactors/stp2.html	IV	PWR-DRYAMB WEST 4LP BECH EBSO	3,853 1,280 NPF-80	12/22/1975 03/28/1989 06/19/1989 09/28/2017 N/A 12/15/2048
Surry Power Station, Unit 1 Virginia Electric and Power Co. Surry, VA (17 miles NW of Newport News, VA) 05000280 https://www.nrc.gov/info-finder/reactors/sur1.html	II	PWR-DRYSUB WEST 3LP S&W S&W	2,587 838 DPR-32	06/25/1968 05/25/1972 12/22/1972 03/20/2003 05/04/2021 05/25/2052

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Surry Power Station, Unit 2 Virginia Electric and Power Co. Surry, VA (17 miles NW of Newport News, VA) 05000281 https://www.nrc.gov/info-finder/reactors/sur2.html	II	PWR-DRYSUB WEST 3LP S&W S&W	2,587 838 DPR-37	06/25/1968 01/29/1973 05/01/1973 03/20/2003 05/04/2021 01/29/2053
Susquehanna Steam Electric Station, Unit 1 Susquehanna Nuclear, LLC Salem Township (Luzerne County), PA (70 miles NE of Harrisburg, PA) 05000387 https://www.nrc.gov/info-finder/reactors/susq1.html	I	BWR-MARK 2 GE 4 BECH BECH	3,952 1,247 NPF-14	11/03/1973 07/17/1982 06/08/1983 11/24/2009 N/A 07/17/2042
Susquehanna Steam Electric Station, Unit 2 Susquehanna Nuclear, LLC Salem Township (Luzerne County), PA (70 miles NE of Harrisburg, PA) 05000388 https://www.nrc.gov/info-finder/reactors/susq2.html	I	BWR-MARK 2 GE 4 BECH BECH	3,952 1,247 NPF-22	11/03/1973 03/23/1984 02/12/1985 11/24/2009 N/A 03/23/2044
Turkey Point Nuclear Generating, Unit 3 Florida Power & Light Co. Homestead, FL (20 miles S of Miami, FL) 05000250 https://www.nrc.gov/info-finder/reactors/tp3.html	II	PWR-DRYAMB WEST 3LP BECH BECH	2,644 837 DPR-31	04/27/1967 07/19/1972 12/14/1972 06/06/2002 12/04/2019 07/19/2052
Turkey Point Nuclear Generating, Unit 4 Florida Power & Light Co. Homestead, FL (20 miles S of Miami, FL) 05000251 https://www.nrc.gov/info-finder/reactors/tp4.html	II	PWR-DRYAMB WEST 3LP BECH BECH	2,644 861 DPR-41	04/27/1967 04/10/1973 09/07/1973 06/06/2002 12/04/2019 04/10/2053
Virgil C. Summer Nuclear Station, Unit 1 Dominion Energy South Carolina, Inc. Jenkinsville, SC (26 miles NW of Columbia, SC) 05000395 https://www.nrc.gov/info-finder/reactors/sum.html	II	PWR-DRYAMB WEST 3LP GIL DANI	2,900 971 NPF-12	03/21/1973 11/12/1982 01/01/1984 04/23/2004 N/A 08/06/2042

APPENDIX A

Commercial Nuclear Power Reactors Operating Reactors (continued)

Plant Name, Unit Number Licensee Location Docket Number NRC Web page Address	NRC Region	Con Type NSSS Architect Engineer Constructor	Licensed MWt MWe License Number	CP Issued OL Issued Comm. Op LR Issued SR Issued Exp. Date
Vogtle Electric Generating Plant, Unit 1 Southern Nuclear Operating Co., Inc. Waynesboro, GA (26 miles SE of Augusta, GA) 05000424 https://www.nrc.gov/info-finder/reactors/vog1.html	II	PWR-DRYAMB WEST 4LP SBEC GPC	3,625.6 1,150 NPF-68	06/28/1974 03/16/1987 06/01/1987 06/03/2009 N/A 01/16/2047
Vogtle Electric Generating Plant, Unit 2 Southern Nuclear Operating Co., Inc. Waynesboro, GA (26 miles SE of Augusta, GA) 05000425 https://www.nrc.gov/info-finder/reactors/vog2.html	II	PWR-DRYAMB WEST 4LP SBEC GPC	3,625.6 1,152 NPF-81	06/28/1974 03/31/1989 05/20/1989 06/03/2009 N/A 02/09/2049
Waterford Steam Electric Station, Unit 3 Entergy Operations, Inc. Killona, LA (25 miles W of New Orleans, LA) 05000382 https://www.nrc.gov/info-finder/reactors/wat3.html	IV	PWR-DRYAMB COMB CE EBSO EBSO	3,716 1,165 NPF-38	11/14/1974 03/16/1985 09/24/1985 12/27/2018 N/A 12/18/2044
Watts Bar Nuclear Plant, Unit 1 Tennessee Valley Authority Spring City, TN (60 miles SW of Knoxville, TN) 05000390 https://www.nrc.gov/info-finder/reactors/wb1.html	II	PWR-ICECND WEST 4LP TVA TVA	3,459 1,123 NPF-90	01/23/1973 02/07/1996 05/27/1996 N/A N/A 11/09/2035
Watts Bar Nuclear Plant, Unit 2 Tennessee Valley Authority Spring City, TN (60 miles SW of Knoxville, TN) 05000391 https://www.nrc.gov/info-finder/reactors/wb2.html	II	PWR-ICECND WEST 4LP TVA TVA	3,411 1,122 NPF-96	01/24/1973 10/22/2015 10/19/2016 N/A N/A 10/22/2055
Wolf Creek Generating Station, Unit 1 Wolf Creek Nuclear Operating Corp. Burlington (Coffey County), KS (28 miles SE of Emporia, KS) 05000482 https://www.nrc.gov/info-finder/reactors/wc.html	IV	PWR-DRYAMB WEST 4LP BECH DANI	3,565 NPF-42	05/17/1977 06/04/1985 ^F 09/03/1985 11/20/2008 N/A 03/11/2045

F: 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 MWe License Number	10 CFR 52.103(g) Finding COL Issued Comm. Op LR Issued Exp. Date
Bellefonte Nuclear Plant, Unit 1** Tennessee Valley Authority (6 miles NE of Scottsboro, AL) 05000438 https://www.nrc.gov/reactors/new-reactors/bellefonte-constr-permits.html	II	PWR-DRYAMB B&W 205 TVA TVA	3,763	12/24/1974
Bellefonte Nuclear Plant, Unit 2** Tennessee Valley Authority (6 miles NE of Scottsboro, AL) 05000439 https://www.nrc.gov/reactors/new-reactors/bellefonte-constr-permits.html	II	PWR-DRYAMB B&W 205 TVA TVA	3,763	12/24/1974
Enrico Fermi Nuclear Plant, Unit 3 DTE Electric Company Newport, MI (25 miles NE of Toledo, OH) 05200033 https://www.nrc.gov/reactors/new-reactors/col-holder/ferm3.html	III	ESBWR GEH	4,500 NPF-95	05/01/2015
North Anna Power Station, Unit 3 Dominion Virginia Power Mineral (Louisa County), VA (40 miles NW of Richmond, VA) 05200017 https://www.nrc.gov/reactors/new-reactors/col-holder/na3.html	II	BWR ESBWR GEH	4,500 NPF-103	06/02/2017
Turkey Point Plant, Unit 6 Florida Power and Light Homestead, FL (20 miles S of Miami, FL) 05200040 https://www.nrc.gov/reactors/new-reactors/col-holder/tp6.html	II	PWR AP1000 WEST 2LP	3,400 NPF-104	04/12/2018
Turkey Point Plant Unit 7 Florida Power and Light Homestead, FL (20 miles S of Miami, FL) 05200041 https://www.nrc.gov/reactors/new-reactors/col-holder/tp7.html	II	PWR AP1000 WEST 2LP	3,400 NPF-105	04/12/2018
Vogtle Electric Generating Plant, Unit 3 Southern Nuclear Operating Co., Inc. Waynesboro (Burke County), GA (26 miles SE of Augusta, GA) 05200025 https://www.nrc.gov/reactors/new-reactors/col-holder/vog3.html	II	PWR AP1000 WEST 2LP	3,400 NPF-91	02/10/2012 08/03/2022 08/03/2062

APPENDIX A
Commercial Nuclear Power Reactors
Operating Reactors Under Active Construction or Deferred Policy
(continued)

Plant Name, Unit Number	Con Type	Licensed	10 CFR 52.103(g) Finding	
Licensee	NSSS	MWt	COL Issued	
Location	Architect Engineer	MWe	Comm. Op.	
Docket Number	Constructor	License	LR Issued	
NRC Web page Address	NRC Region	Number	Exp. Date	
Vogtle Electric Generating Plant, Unit 4 Southern Nuclear Operating Co., Inc. Waynesboro (Burke County), GA (26 miles SE of Augusta, GA) 05200026 https://www.nrc.gov/reactors/new-reactors/col-holder/vog4.html	II	PWR AP1000 WEST 2LP	3,400 NPF-92	02/10/2012
William States Lee III Nuclear Station, Unit 3 ^A Duke Energy Carolinas Cherokee County, SC (2 miles SE of Gafney, SC) 05200018 https://www.nrc.gov/reactors/new-reactors/col-holder/lee1.html	II	PWR AP1000 WEST 2LP	3,400 NPF-101	12/19/2016
William States Lee III Nuclear Station, Unit 4 ^A Duke Energy Carolinas Cherokee County, SC (2 miles SE of Gafney, SC) 05200019 https://www.nrc.gov/reactors/new-reactors/col-holder/lee2.html	II	PWR AP1000 WEST 2LP	3,400 NPF-102	12/19/2016

A: In September 2017, Duke Energy announced cancellation of William States Lee III Nuclear Station, Units 3 and 4.

* Average capacity factor is listed in year order starting with 2014.

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

*** In June 2018, Nuclear Innovation North America submitted a letter requesting that South Texas Project, Units 3 and 4, combined licenses (COLs) be withdrawn.

Note: Plant names and data are as identified on the license as of September 2022.

Source: NRC, with some data compiled from the U.S. Department of Energy's (DOE's) Energy Information Administration (EIA).

APPENDIX B

New Nuclear Power Plant Licensing Applications

Applicant	Docket Number	Type	Submittal Date	Design	Site	Existing State	Plant?	Date Accepted	Status
Combined License (Construction and Operating)									
Nuclear Innovation North America, LLC (NINA)	05200012 & 05200013	COL	09/20/07 09/20/07	ABWR	South Texas Project, Units 3 and 4	TX	Yes	11/29/07	COL terminated 07/12/2018
Tennessee Valley Authority (TVA)	05200014 & 05200015	COL	10/30/07	AP1000	Bellefonte, Units 3 and 4	AL	No	01/18/08	Withdrawn—12/02/2016
Dominion Virginia Power	05200017	COL	11/27/07	ESBWR	North Anna, Unit 3	VA	Yes	01/28/08	COL Issued 06/02/2017
Duke Energy Carolinas	05200018 & 05200019	COL	12/13/07	AP1000	Lee Nuclear Station, Units 3 and 4	SC	No	02/25/08	COL Issued 12/19/2016
Progress Energy	05200022 & 05200023	COL	02/19/08	AP1000	Shearon Harris, Units 2 and 3	NC	Yes	04/17/08	Suspended—05/02/2013
Southern Nuclear Operating Co., Inc.	05200025 & 05200026	COL	03/28/08	AP1000	Vogtle, Units 3 and 4	GA	Yes	05/30/08	COL Issued 02/10/2012
AmerenUE	05200037	COL	07/24/08	U.S. EPR	Callaway, Unit 2	MO	Yes	12/12/08	Withdrawn—10/29/2015
DTE Electric Company	05200033	COL	09/18/08	ESBWR	Fermi, Unit 3	MI	Yes	11/25/08	COL Issued 05/01/2015
Luminant Generation Co.	05200034 & 05200035	COL	09/19/08	US-APWR	Comanche Peak, Units 3 and 4	TX	Yes	12/02/08	Suspended—03/31/2014
Entergy	05200036	COL	09/25/08	ESBWR	River Bend, Unit 3	LA	Yes	12/04/08	Withdrawn—06/14/2016
PPL Bell Bend	05200039	COL	10/10/08	U.S. EPR	Bell Bend (1 Unit)	PA	Yes	12/19/08	Withdrawn—09/22/2016
Florida Power and Light	05200040 & 05200041	COL	06/30/09	AP1000	Turkey Point, Units 6 and 7	FL	Yes	09/04/09	COL Issued 04/12/2018
Duke Energy Florida	05200029 & 05200030	COL	07/30/08	AP1000	Levy County, Units 1 and 2	FL	No	10/06/08	COL Terminated 04/26/2018
Oklo Power LLC	05200049	COL	03/11/20	Aurora	Idaho National Laboratory	ID	No	06/05/20	Denied—06/06/2022

APPENDIX B

New Nuclear Power Plant Licensing Applications (continued)

Applicant	Docket Number	Type	Submittal Date	Design	Site	Existing State	Plant?	Date Accepted	Status
Design Certification									
AREVA NP	05200020	DC	12/11/07	U.S. EPR	N/A	N/A	N/A	02/25/08	Suspended– 03/27/2015
Mitsubishi Heavy Industries	05200021	DC	12/31/07	US-APWR	N/A	N/A	N/A	02/29/08	Suspended– 03/03/2020
Korea Electric Power Company and Korea Hydro and Nuclear Power	05200046	DC	12/23/14	APR1400	N/A	N/A	N/A	03/04/15	Certified Issued 09/19/2019
Toshiba Corporation	05200044	DC	10/27/10	ABWR	N/A	N/A	N/A	12/14/10	Withdrawn– 12/30/2016
GE-Hitachi Nuclear Energy	05200045	DC	12/7/10	ABWR	N/A	N/A	N/A	02/14/11	Certified Issued 09/29/2021
NuScale Power LLC	05200048	DC	01/6/17	NuScale	N/A	N/A	N/A	03/23/17	Scheduled
Early Site Permit									
PSEG Power, LLC, and PSEG Nuclear, LLC (PSEG)	05200043	ESP	05/25/10	Not yet announced	PSEG Site	NJ	Yes	08/04/10	Issued 05/06/2016
Tennessee Valley Authority	05200047	ESP	05/12/16	Not yet announced	Clinch River Site	TN	No	12/30/16	Issued 12/19/2019

Notes: Withdrawal was requested for Calvert Cliffs, Grand Gulf, Nine Mile Point, Victoria County, Bellefonte, and Callaway combined license and early site permit (ESP). In September 2017, Duke Energy announced cancellation of William States Lee III nuclear station Units 3 and 4. Data are current as of September 30, 2022.. 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 MWe	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
Duane Arnold Palo, IA 05000331	BWR-MARK 1 1,912	GE 4	06/22/1970 08/10/2020 2040	SAFSTOR SAFSTOR in Progress
Fermi 1 Newport, MI 05000016	SCF 200	CE	05/10/1963 09/22/1972 2032	SAFSTOR SAFSTOR
Fort Calhoun 1 Ft. Calhoun, NE 05000285	PWR-DRYAMB 1,500	CE	08/09/1973 10/24/2016 2076	SAFSTOR SAFSTOR in Progress
Fort St. Vrain Platteville, CO 05000267	HTG 842	GA	12/21/1973 08/18/1989 08/08/1997	DECON DECON Completed
GE EVESR Sunol, CA 05000183	Experimental Superheat Reactor 12.5	GE	11/12/1963 02/01/1967 04/15/1970 2025	SAFSTOR SAFSTOR
GE VBWR (Vallecitos) Sunol, CA 05000018	BWR 50	GE	08/31/1957 12/09/1963 2025	SAFSTOR SAFSTOR
Haddam Neck Meriden, CT 05000213	PWR 1,825	WEST	12/27/1974 12/05/1996 11/26/2007	DECON DECON Completed

APPENDIX C
Commercial Nuclear Power Reactors Undergoing
Decommissioning and Permanently Shut Down
Formerly Licensed to Operate (continued)

Unit Location Docket Number	Reactor Type MWt MWe	NSSS Vendor	OL Issued Shut Down OL Terminated Closure Date Est.	Decommissioning Alternative Selected Current License Status
Humboldt Bay 3 Eureka, CA 05000133	BWR 200	GE	08/28/1962 07/02/1976 2019	DECON DECON in Progress
Indian Point 1 Buchanan, NY 05000003	PWR 615	B&W	03/26/1962 10/31/1974 2036	DECON DECON in Progress
Indian Point 2 Buchanan, NY 05000247	PWR 3,216	WEST	09/28/1973 04/30/2020	DECON DECON in Progress
Indian Point 3 Buchanan, NY 05000286	PWR 3,216	WEST	12/12/1975 04/30/2021	DECON DECON in Progress
Kewaunee Carlton, WI 05000305	PWR 1,772	WEST 2LP	12/21/1973 05/07/2013 2073	SAFSTOR SAFSTOR
LaCrosse Genoa, WI 05000409	BWR 165	AC	07/03/1967 04/30/1987 2020	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
Oyster Creek Forked River, NJ 05000219	BWR 1,930	GE	04/09/1969 09/17/2018 2078	SAFSTOR SAFSTOR
Palisades Covert, MI 05000255	PWR-DRYAMB 2,565.4	CE	02/21/1991 ^A 05/31/2022	SAFSTOR SAFSTOR

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

APPENDIX C
Commercial Nuclear Power Reactors Undergoing
Decommissioning and Permanently Shut Down
Formerly Licensed to Operate (continued)

Unit Location Docket Number	Reactor Type MWt MWe	NSSS Vendor	OL Issued Shut Down OL Terminated Closure Date Est.	Decommissioning Alternative Selected Current License Status
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
Pilgrim Plymouth, MA 05000293	BWR-MARK 1 2,028	GE 3	06/08/1972 05/31/2019 2064	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 2030	DECON SAFSTOR
San Onofre 2 San Clemente, CA 05000361	PWR CE 3,438	CE	02/16/1982 06/12/2013 2030	DECON DECON in Progress
San Onofre 3 San Clemente, CA 05000362	PWR CE 3,438	CE	11/15/1982 06/12/2013 2030	DECON DECON in Progress
Savannah, N.S. Baltimore, MD 05000238	PWR 74	B&W	08/1965 11/1970 2031	DECON DECON in Progress
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

APPENDIX C

Commercial Nuclear Power Reactors Undergoing Decommissioning and Permanently Shut Down Formerly Licensed to Operate (continued)

Unit Location Docket Number	Reactor Type MWt MWe	NSSS Vendor	OL Issued Shut Down OL Terminated Closure Date Est.	Decommissioning Alternative Selected Current License Status
Three Mile Island 1 Middletown, PA 05000289	PWR 2,568	WEST	04/19/1974 09/20/2019 2079	SAFSTOR
Three Mile Island 2** Middletown, PA 05000320	PWR 2,770	B&W	02/08/1978 03/28/1979 12/31/2036	DECON DECON in Progress
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 2030	DECON DECON in Progress
Zion 1 Zion, IL 05000295	PWR 3,250	WEST	10/19/1973 02/21/1997 2021	DECON DECON in Progress
Zion 2 Zion, IL 05000304	PWR 3,250	WEST	11/14/1973 09/19/1996 2021	DECON DECON in Progress

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

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

Notes: GE Bonus, Hallam, and Piqua decommissioned reactor sites are part of the Department of Energy's nuclear legacy. For more information, visit DOE's Legacy Management website at <https://energy.gov/lm/sites/lm-sites>. CVTR, Elk River, and Shippingport decommissioned reactor sites were either decommissioned before the formation of the NRC or were not licensed by the NRC. N.S. = Nuclear Ship. See the NRC Online Glossary for definitions of decommissioning alternatives (DECON, SAFSTOR).

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

Data are current as of August 2021.

APPENDIX D

Canceled Commercial Nuclear Power Reactors 10 CFR Part 50—Domestic Licensing of Production and Utilization Facilities

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
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
Davis-Besse 2 & 3 Toledo Edison Company 21 miles ESE of Toledo, OH	PWR 906	1981 Under CP Review 05000500 & 501

APPENDIX D

Canceled Commercial Nuclear Power Reactors

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

Unit Utility Location	Con Type MWe per Unit	Canceled Date Status Docket Number
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
Hope Creek 2 Public Service Electric & Gas Company 18 miles SE of Wilmington, DE	BWR 1,067	1981 With CP 05000355

APPENDIX D

Canceled Commercial Nuclear Power Reactors

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

Unit Utility Location	Con Type MWe per Unit	Canceled Date Status Docket Number
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 Richland, WA, near Arlington, OR	PWR 1,260	1982 Under CP Review 05000514 & 515
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

APPENDIX D

Canceled Commercial Nuclear Power Reactors

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

Unit Utility Location	Con Type MWe per Unit	Canceled Date Status Docket Number
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
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

APPENDIX D

Canceled Commercial Nuclear Power Reactors

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

Unit Utility Location	Con Type MWe per Unit	Canceled Date Status Docket Number
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 12 miles NE of Richland, WA	PWR 1,266	1995 With CP 05000460
Washington Nuclear 3 (WPPSS) Energy Northwest 12 miles NE of Richland, WA	PWR 1,242	1995 With CP 05000508
Washington Nuclear 4 (WPPSS) Energy Northwest 12 miles NE of Richland, WA	PWR 1,218	1982 With CP 05000513
Washington Nuclear 5 (WPPSS) Energy Northwest 12 miles NE of Richland, 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

10 CFR Part 52—Licensing, Certification, and Approvals for Nuclear Power Plants

Unit Utility Location	Con Type MWe per Unit	Canceled Date Status Docket Number
Bellefonte 3 & 4 Tennessee Valley Authority Scottsboro, Jackson County, AL	AP1000 3,763	December 2, 2016 With COL Review 05200014 & 05200015
Bell Bend Bell Bend, LLC Luzerne County, PA	U.S. EPR 1,600	September 22, 2016 With COL Review 5200039
Callaway 2 Union Electric Company (Ameren UE) Fulton, Callaway County, MO	U.S. EPR 1,600	October 29, 2015 With COL Review 05200037
Calvert Cliffs 3 UniStar Nuclear Operating Services, LLC Near Lusby in Calvert County, MD	U.S. EPR 1,594	July 17, 2015 With COL Review 05200016
Grand Gulf 3 Entergy Operations, Inc. Near Port Gibson in Claiborne County, MS	ESBWR 1,594	September 15, 2015 With COL Review 05200024
Levy 1 and 2 Duke Energy Florida 2 miles NE of Inglis, FL	AP1000 1,100	April 26, 2018 With COL 05200029 & 05200030
Nine Mile Point 3 UniStar Nuclear Operating Services, LLC 25 miles SE of Cincinnati, OH	ESBWR 1,594	March 31, 2014 With COL Review 05000038
River Bend 3 Entergy Operations, Inc. St. Francisville, LA	ESBWR 1,594	June 14, 2016 With COL Review 05200036
South Texas Project 3 and 4 Nuclear Innovation North America, LLC Bay City, TX	ABWR 3,926	July 12, 2018 With COL 05200012 & 05200013
V.C. Summer, Units 2 and 3 South Carolina Electric & Gas Co. Jenkinsville, SC	AP100 1,100	March 6, 2019 With COL 05200027 & 05200028
Victoria County Station 1 and 2 Exelon Nuclear Texas Holdings, LLC Near Victoria City in Victoria County, TX	ESBWR 4,500	July 20, 2010 With COL Review 05200031 & 05200032

Notes: Cancellation is defined as public announcement of cancellation or written notification to the NRC. Only NRC-docketed applications are included. "Status" is the status of the application at the time of cancellation. NRC actions are still pending. In September 2017, Duke Energy announced plans to cancel William States Lee III Nuclear Station, Units 3 and 4. Data are current as of September 30, 2022. NRC-abbreviated reactor names are listed.

Source: DOE/EIA, "Commercial Nuclear Power 1991," DOE/EIA-0438, Appendix E, and the NRC data.

APPENDIX E

Commercial Nuclear Power Reactor Operating Licenses— Issued by Year

1969	Dresden 2* Ginna* Nine Mile Point 1* (1974)	D.C. Cook 1 FitzPatrick Hatch 1 Oconee 3 Peach Bottom 3 Prairie Island 1 Prairie Island 2	Salem 2 Sequoyah 2	Millstone 3 Palo Verde 2 Perry 1
1970	Point Beach 1* Robinson 2		1982 LaSalle 1 Summer 1 Susquehanna 1	1987 Beaver Valley 2 Braidwood 1 Byron 2 Clinton 1 Harris 1(1986) Nine Mile Point 2 Palo Verde 3 Vogtle 1
1971	Dresden 3 Monticello 1* (1970)	1975 Millstone 2	1983 McGuire 2 St. Lucie 2	
1972	Quad Cities 1 Quad Cities 2 Surry 1 Turkey Point 3	1976 Beaver Valley 1 Browns Ferry 3 Brunswick 1 Calvert Cliffs 2 Salem 1 St. Lucie 1	1984 Callaway Columbia Diablo Canyon 1 Grand Gulf 1 LaSalle 2 (1983) Susquehanna 2	1988 Braidwood 2 South Texas Project 1
1973	Browns Ferry 1 Oconee 1 Oconee 2 Peach Bottom 2 Point Beach 2* Surry 2 Turkey Point 4	1977 Davis-Besse 1 D.C. Cook 2 Farley 1	1985 Byron 1 Catawba 1 Diablo Canyon 2 Fermi 2 Limerick 1 Palo Verde 1 River Bend 1 Waterford 3 Wolf Creek 1	1989 Limerick 2 South Texas Project 2 Vogtle 2
1974	Arkansas Nuclear 1 Browns Ferry 2 Brunswick 2 Calvert Cliffs 1 Cooper	1978 Arkansas Nuclear 2 Hatch 2 North Anna 1 1980 North Anna 2 Sequoyah 1 1981 Farley 2 McGuire 1	1986 Catawba 2 Hope Creek 1	1990 Comanche Peak 1 Seabrook 1 1993 Comanche Peak 2 1996 Watts Bar 1 2015 Watts Bar 2

* The Atomic Energy Commission issued a provisional operating license allowing commercial operations.

Notes: 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 are current as of September 2022.

APPENDIX F

Commercial Nuclear Power Reactor Operating Licenses— Expiration by Year, 2024–2055

2024	Diablo Canyon 1	D.C. Cook 1	McGuire 1	2046	Braidwood 1
2025	Diablo Canyon 2	Cooper	Sequoyah 2		Byron 2 Harris 1 Hope Creek 1 Nine Mile Point 2 Palo Verde 2
2026	Clinton 1 Perry 1	FitzPatrick Hatch 1 Oconee 3 Prairie Island 2	2042 LaSalle 1 Summer 1 Susquehanna 1		
2029	Dresden 2 Ginna Nine Mile Point 1	2035 Millstone 2 Watts Bar 1	2043 Catawba 1 Catawba 2 Columbia LaSalle 2 McGuire 2 St. Lucie 2	2047	Beaver Valley 2 Braidwood 2 Palo Verde 3 South Texas Project 1 Vogtle 1
2030	Comanche Peak 1 Monticello 1 Point Beach 1 Robinson 2	2036 Beaver Valley 1 Browns Ferry 3 Brunswick 1 Calvert Cliffs 2 St. Lucie 1 Salem 1	2044 Byron 1 Callaway Grand Gulf 1 Limerick 1 Susquehanna 2 Waterford 3	2048	South Texas Project 2
2031	Dresden 3			2049	Limerick 2 Vogtle 2
2032	Quad Cities 1 Quad Cities 2	2037 D.C. Cook 2 Davis-Besse 1 Farley 1	2045 Fermi 2 Millstone 3 Palo Verde 1 River Bend 1 Wolf Creek 1	2050	Seabrook Surry 1 Turkey Point 3 Peach Bottom 2
2033	Browns Ferry 1 Comanche Peak 2 Oconee 1 Oconee 2 Point Beach 2 Prairie Island 1	2038 Arkansas Nuclear 2 Hatch 2 North Anna 1		2052	Surry 2
2034	Arkansas Nuclear 1 Browns Ferry 2 Brunswick 2 Calvert Cliffs 1	2040 North Anna 2 Salem 2 Sequoyah 1		2053	Turkey Point 4
		2041 Farley 2		2054	Peach Bottom 3
				2055	Watts Bar 2

Notes: NRC-abbreviated reactor names are listed. Data are current as of September 2022.

APPENDIX G

Operating Nuclear Research and Test Reactors Regulated by the NRC

Licensee Location	Reactor Type OL Issued	Power Level (kW)	Licensee Number Docket Number
Aerotest San Ramon, CA	TRIGA (Indus) 07/02/1965	250	R-98 05000228
Armed Forces Radiobiology Research Institute Bethesda, MD	TRIGA 06/26/1962	1,100	R-84 05000170
Dow Chemical Company Midland, MI	TRIGA MARK I 07/03/1967	300	R-108 05000264
GE-Hitachi Sunol, CA	Tank 10/31/1957	100	R-33 05000073
Idaho State University Pocatello, ID	AGN-201 #103 10/11/1967	0.005	R-110 05000284
Kansas State University Manhattan, KS	TRIGA MARK II 10/16/1962	1,250	R-88 05000188
Massachusetts Institute of Technology Cambridge, MA	HWR Reflected 06/09/1958	6,000	R-37 05000020
Missouri University of Science and Technology Rolla, MO	Pool, MTR type fuel 11/21/1961	200	R-79 05000123
National Institute of Standards and Technology Gaithersburg, MD	Nuclear Test 05/21/1970	20,000	TR-5 05000184
North Carolina State University Raleigh, NC	Pulstar 08/25/1972	1,000	R-120 05000297
Ohio State University Columbus, OH	Pool 02/24/1961	500	R-75 05000150
Oregon State University Corvallis, OR	TRIGA MARK II 03/07/1967	1,100	R-106 05000243
Pennsylvania State University State College, PA	TRIGA 07/08/1955	1,100	R-2 05000005
Purdue University West Lafayette, IN	Lockheed 08/16/1962	12	R-87 05000182
Reed College Portland, OR	TRIGA MARK I 07/02/1968	250	R-112 05000288
Rensselaer Polytechnic Institute Troy, NY	Critical Assembly 07/03/1964	0.1	CX-22 05000225
Rhode Island Atomic Energy Commission Narragansett, RI	GE Pool 07/23/1964	2,000	R-95 05000193
Texas A&M University College Station, TX	AGN-201M #106 08/26/1957	0.005	R-23 05000059

APPENDIX G

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

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

Note: Data are current as of September 2022.

APPENDIX H

Nuclear Research and Test Reactors under Decommissioning Regulated by the NRC

Licensee Location	Reactor Type Power Level (kW)	OL Issued Shutdown
General Atomics San Diego, CA	TRIGA MARK F 1,500	07/01/60 09/07/94
General Atomics San Diego, CA	TRIGA MARK I 250	05/03/58 12/17/96
General Electric Company Sunol, CA	GETR (Tank) 50,000	01/07/59 06/26/85

Note: Data are current as of September 2022.

APPENDIX I

Commercial Nuclear Power Plant Licensing History 1955–2022

Year	Original Licensing Regulations (10 CFR Part 50) ¹		Alternative Licensing Regulations (10 CFR Part 52) ³		Permanent Shutdowns ⁶	Operable Units
	CP Issued ²	Full- Power OL Issued	COL Issued ⁴	Operating COLs ⁵		
1955	1	0	--	--	0	0
1956	3	0	--	--	0	0
1957	1	1	--	--	0	1
1958	0	0	--	--	0	1
1959	3	1	--	--	0	2
1960	7	1	--	--	0	3
1961	0	0	--	--	0	3
1962	1	6	--	--	0	9
1963	1	2	--	--	1	11
1964	3	3	--	--	1	13
1965	1	0	--	--	0	13
1966	5	2	--	--	17	14
1967	14	3	--	--	2	15
1968	23	0	--	--	1	13
1969	7	4	--	--	0	17
1970	10	3	--	--	1	20
1971	4	2	--	--	0	22
1972	8	6	--	--	2	27
1973	14	15	--	--	0	42
1974	23	15	--	--	2	55
1975	9	2	--	--	0	57
1976	9	7	--	--	1	63
1977	15	4	--	--	0	67
1978	13	4	--	--	1	70
1979	2	0	--	--	1	69
1980	0	2	--	--	0	71
1981	0	4	--	--	0	75
1982	0	4	--	--	1	78
1983	0	3	--	--	0	81
1984	0	6	--	--	0	87
1985	0	9	--	--	0	96
1986	0	5	--	--	0	101
1987	0	8	--	--	1	107
1988	0	2	--	--	0	109
1989	0	4	--	--	3	111
1990	0	2	--	--	0	112
1991	0	0	--	--	1	111
1992	0	0	--	--	2	109
1993	0	1	--	--	0	110
1994	0	0	--	--	0	109
1995	0	0	--	--	0	109
1996	0	1	--	--	3	109

APPENDIX I

Commercial Nuclear Power Plant Licensing History 1955–2022 (continued)

Year	Original Licensing Regulations (10 CFR Part 50) ¹		Alternative Licensing Regulations (10 CFR Part 52) ³		Permanent Shutdowns ⁶	Operable Units
	CP Issued ²	Full-Power OL Issued	COL Issued ⁴	Operating COLs ⁵		
1997	0	0	0	0	2	107
1998	0	0	0	0	1	104
1999– 2011	0	0	0	0	0	104
2012	0	0	4 units	0	0	104
2013	0	0	0	0	4	100
2014	0	0	0	0	1	99
2015	0	1	1 unit	0	0	100
2016	0	0	6 units	0	1	99
2017	0	0	1 unit	0	0	99
2018	0	0	2 units	0	1	98
2019	0	0	0	0	2	96
2020	0	0	0	0	2	94
2021	0	0	0	0	1	93
2022	0	0	0	1	1	93*
Total	177	133	14 units	1	40	--

 U.S. Atomic Energy Commission was the regulatory authority.

-- Not applicable

* Includes Vogtle Electric Generating Plant, Unit 3 (Southern Nuclear), which plans to enter service in the first quarter of 2023.

¹ Data in columns 1–3 are based on 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." Numbers reflect permits or licenses issued in a given year, not extant permits or licenses.

² Issuance by regulatory authority of a permit, or equivalent permission, to begin construction. Under alternative licensing regulations in 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," a construction permit (CP) is not issued separately from the operating license.

³ Data in columns 4–6 are based on 10 CFR Part 52. Numbers reflect permits or licenses issued in a given year, not extant permits or licenses.

⁴ Number of combined licenses (COLs) issued in a given year, including six that were subsequently terminated. See appendix A on status of plant construction and appendix B for more information on withdrawn and suspended applications.

⁵ Issuance by the NRC of a finding under 10 CFR 52.103(g), in a given year.

⁶ Number of operating plants transitioned to shutdown in a given year. Does not represent the total number of reactor units included.

⁷ These are U.S. Department of Energy (DOE) nuclear legacy sites: Hallam (1964), Piqua (1966), Elk River (1968), and Shippingport (1982). For more information, visit the DOE's Legacy Management website at <https://energy.gov/lm/sites/lm-sites> and see the NRC Online Glossary for definitions of decommissioning alternatives (DECON, SAFSTOR).



Source: U.S. Energy Information Administration/Annual Energy Review 2011 located at <https://www.eia.gov/aer> and compilation of NRC information following 2011.

Data are current as of September 2022.

APPENDIX J

Materials Licenses by State

Number of Licenses		
State	NRC	Agreement States
Alabama	9	329
Alaska	56	0
Arizona	5	352
Arkansas	4	176
California	46	1,634
Colorado	17	311
Connecticut	111	0
Delaware	37	0
District of Columbia	33	0
Florida	21	1,533
Georgia	15	385
Hawaii	49	0
Idaho	63	0
Illinois	18	544
Indiana	194	0
Iowa	1	131
Kansas	13	248
Kentucky	6	339
Louisiana	11	436
Maine	2	89
Maryland	64	508
Massachusetts	16	396
Michigan	380	0
Minnesota	12	147
Mississippi	6	244
Missouri	214	0
Montana	74	0
Nebraska	3	203
Nevada	1	223

 Agreement State
 Letter of Intent

Number of Licenses		
State	NRC	Agreement States
New Hampshire	2	70
New Jersey	21	523
New Mexico	6	203
New York	14	1,270
North Carolina	18	526
North Dakota	3	73
Ohio	42	522
Oklahoma	13	251
Oregon	3	254
Pennsylvania	40	494
Rhode Island	1	42
South Carolina	4	320
South Dakota	33	0
Tennessee	22	493
Texas	41	1,385
Utah	6	190
Vermont	1	32
Virginia	43	374
Washington	11	320
West Virginia	131	0
Wisconsin	6	286
Wyoming	69	15
Puerto Rico	92	0
Virgin Islands	10	0
Guam	5	0
American Samoa	2	0
Northern Marianas	1	0
Total number of materials licenses in Agreement State jurisdiction		15,871
Total number of materials licenses in NRC jurisdiction		2,120
Total number of materials licenses in the United States		17,991

Notes: The NRC and Agreement State data are current as of September 2022. These totals represent an estimate because the number of specific radioactive materials licenses per State may change daily. The NRC licenses Federal agencies in Agreement States.

APPENDIX K

Major U.S. Fuel Cycle Facility Sites

Licensee	Location	Status	Docket #
Uranium Hexafluoride Conversion Facility			
Honeywell International, Inc.	Metropolis, IL	ready-idle*	04003392
Uranium Fuel Fabrication Facilities			
Global Nuclear Fuel-Americas, LLC	Wilmington, NC	active	07001113
Westinghouse Electric Company, LLC Columbia Fuel Fabrication Facility	Columbia, SC	active	07001151
Nuclear Fuel Services, Inc.	Erwin, TN	active	07000143
BWXT Nuclear Operations Group, Inc.	Lynchburg, VA	active	07000027
Framatome, Inc.	Richland, WA	active	07001257
TRISO-X, LLC	Oak Ridge, TN	license application under review	07007027
Gas Centrifuge Uranium Enrichment Facilities			
Centrus Energy Corp American Centrifuge Plant	Piketon, OH	license issued, under construction	07007004
Centrus Energy Corp Lead Cascade	Piketon, OH	license active (facility decommissioned)	07007003
URENCO-USA (Louisiana Energy Services)	Eunice, NM	active	07003103
Uranium Enrichment Laser Separation Facility			
GE-Hitachi Global Laser Enrichment, LLC	Wilmington, NC	license terminated	07007016
Depleted Uranium Deconversion Facility			
International Isotopes, Inc.	Hobbs, NM (Lea County)	license issued, construction not started	04009086

* The facility is being maintained with minimal operations to support a future return to production.

Notes: On February 8, 2019, the NRC issued a termination of the construction authorization (CAMOX-001) for the Mixed-Oxide Fuel Fabrication Facility (see Agencywide Documents Access and Management System (ADAMS) Accession No. ML18318A135). Centrus Energy Corp–American Centrifuge Plant is under construction for High Assay Low Enriched Uranium Demonstration Program. On January 5, 2021, the NRC issued a letter terminating the license for the Global Laser Enrichment Facility (see ADAMS Accession No. ML20293A175). On April 6, 2022, the NRC received a special nuclear material license application under Title 10 of the *Code of Federal Regulations* Part 70, "Domestic Licensing of Special Nuclear Material, from TRISO-X, LLC for the nation's first high-assay low-enrichment uranium fuel fabrication facility (ML22101A200).

Note: Data are current as of September 30, 2022.

APPENDIX L

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 (expired)
NAC International, Inc.	07201002	NAC S/T (expired)
	07201003	NAC-C28 S/T (expired)
	07201015	NAC-UMS
	07201025	NAC-MPC
	07201031	MAGNASTOR
	07201013	NAC-STC
Holtec International	07201008	HI-STAR 100
	07201014	HI-STORM 100
	07201032	HI-STORM FW
	07201040	HI-STORM UMAX
Westinghouse Electric Co.	07201007	VSC-24
	07201026	Fuel Solutions™ (WSNF-220, -221, -223)
		W-150 Storage Cask
		W-100 Transfer Cask
		W-21, W-74 Canisters
TN Americas, LLC (formerly Transnuclear, Inc.)	07201005	TN-24 (expired)
	07201027	TN-68
	07201021	TN-32
	07201004	Standardized NUHOMS®-24P, -24PHB, 24PTH, -32PT, -32PTH1, -37PTH, -52B, -61BT DSC,-61BTH, -69BTH
	07201029	Standardized Advanced NUHOMS®-24PT1, -24PT4
	07201030	NUHOMS® HD-32PTH
	07201042	NUHOMS® EOS

Notes: Data are current as of September 2022.



Scan QR Code for the latest list for the Dry Spent Fuel Storage Designs: NRC Approved for General Use on website

APPENDIX M

Dry Cask Spent Fuel Storage Licensees

Name Licensee	License Type	Vendor	Storage Model	Docket Number
Arkansas Nuclear Entergy Nuclear Operations, Inc.	GL	Westinghouse Electric Co. Holtec International	VSC-24 HI-STORM 100	07200013
Beaver Valley FirstEnergy Nuclear Operating Company	GL	TN Americas, LLC	NUHOMS®-37PTH	07201043
Big Rock Point Entergy Nuclear Operations, Inc.	GL	Westinghouse Electric Co.	Fuel Solutions™ W74	07200043
Braidwood Exelon Generation Co., LLC	GL	Holtec International	HI-STORM 100	07200073
Browns Ferry Tennessee Valley Authority	GL	Holtec International	HI-STORM 100S HI-STORM FW	07200052
Brunswick Carolina Power Co.	GL	TN Americas, LLC	NUHOMS®-HD-61BTH	07200006
Byron Exelon Generation Co., LLC	GL	Holtec International	HI-STORM 100	07200068
Callaway Union Electric Co. Ameren Missouri	GL	Holtec International	HI-STORM UMAX	07201045
Calvert Cliffs Calvert Cliffs Nuclear Power Plant, Inc.	SL	TN Americas, LLC	NUHOMS®-24P NUHOMS®-32P	07200008
Catawba Duke Energy Carolinas, LLC	GL	NAC International, Inc.	NAC-UMS® MAGNASTOR®	07200045
Clinton Exelon Generation Co., LLC	GL	Holtec International	HI-STORM FW	07201046
Columbia Generating Station Energy Northwest	GL	Holtec International	HI-STORM 100S	07200035
Comanche Peak Luminant Generation Company, LLC	GL	Holtec International	HI-STORM 100	07200074
Cooper Nuclear Station Nebraska Public Power District	GL	TN Americas, LLC	NUHOMS®-61BT	07200066
Crystal River Duke Energy Company	GL	TN Americas, LLC	NUHOMS®-32PT	07201035
Davis-Besse FirstEnergy Nuclear Operating Company	GL	TN Americas, LLC	NUHOMS®-24P NUHOMS®-32PTH	07200014
D.C. Cook Indiana/Michigan Power	GL	Holtec International	HI-STORM 100	07200072
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

APPENDIX M

Dry Cask Spent Fuel Storage Licensees (continued)

Name Licensee	License Type	Vendor	Storage Model	Docket Number
Duane Arnold NextEra Energy Inc. Duane Arnold, LLC	GL	TN Americas, LLC	NUHOMS®-61BT	07200032
Fermi DTE Electric Company	GL	Holtec International	HI-STORM 100	07200071
Fort Calhoun Omaha Public Power District	GL	TN Americas, LLC	NUHOMS®-32PT	07200054
Fort St. Vrain* U.S. Department of Energy	SL	FW Energy Applications, Inc.	Modular Vault Dry Store	07200009
Grand Gulf Entergy Nuclear Operations, Inc.	GL	Holtec International	HI-STORM 100S	07200050
H.B. Robinson Carolina Power & Light Company	SL	TN Americas, LLC	NUHOMS®-7P	07200003
Haddam Neck CT Yankee Atomic Power	GL	TN Americas, LLC	NUHOMS®-24P NUHOMS®-24PTH	07200060
Hatch Southern Nuclear Operating Co. Inc.	GL	NAC International, Inc.	NAC-MPC	07200039
Hope Creek PSEG Nuclear, LLC	GL	Holtec International	HI-STORM100 HI-STAR100	07200036
Humboldt Bay Pacific Gas & Electric Co.	GL	Holtec International	HI-STORM 100	07200048
Idaho National Laboratory TMI-2 U.S. Department of Energy	SL	Holtec International	HI-STAR 100HB	07200027
Idaho Spent Fuel Facility U.S. Department of Energy	SL	TN Americas, LLC	NUHOMS®-12T	07200020
Indian Point Entergy Nuclear Operations, Inc.	SL	Foster Wheeler	Concrete Vault	07200025
James A. FitzPatrick Entergy Nuclear	GL	Holtec International	HI-STORM 100	07200012
Joseph M. Farley Southern Nuclear Operating Co.	GL	Holtec International	HI-STORM 100S HI-STORM 100S	07200013 07200042
Kewaunee Dominion Energy	GL	Holtec International	NUHOMS®-32PT MAGNASTOR®	07200064
Kewaunee, Inc. La Salle Exelon Generation Co., LLC	GL	Holtec International	HI-STORM 100S	07200070
LaCrosse Dairyland Power	GL	NAC International, Inc.	NAC-MPC	07200046
Limerick Exelon Generation Co., LLC	GL	TN Americas, LLC	NUHOMS®-61BT NUHOMS®-61BTH	07200065
Maine Yankee Maine Yankee Atomic Power Company	GL	NAC International, Inc.	NAC-UMS®	07200030
McGuire Duke Energy, LLC	GL	TN Americas, LLC NAC International, Inc.	TN-32 NAC-UMS® MAGNASTOR®	07200038

APPENDIX M

Dry Cask Spent Fuel Storage Licensees (continued)

Name Licensee	License Type	Vendor	Storage Model	Docket Number
Millstone Dominion Generation	GL	TN Americas, LLC	NUHOMS®-32PT	07200047
Monticello Northern States Power Co., Minnesota	GL	TN Americas, LLC	NUHOMS®-61BT NUHOMS®-61BTH	07200058
Nine Mile Point Constellation Energy	GL	TN Americas, LLC	NUHOMS®-61BT	07201036
North Anna Virginia Electric & Power Co. (Dominion Energy Virginia)	GL SL	TN Americas, LLC TN Americas, LLC	NUHOMS®32PTH1 TN-32 07200016	07200056
Oconee Duke Energy Company	SL GL	TN Americas, LLC TN Americas, LLC	NUHOMS®-24P NUHOMS®-24P	07200004 07200040
Oyster Creek Oyster Creek Environmental Protection, LLC	GL	TN Americas, LLC	NUHOMS®-61BT NUHOMS®-61BTH	07200015
Palisades Entergy Nuclear Operations, Inc.	GL	Westinghouse Electric Co TN Americas, LLC	VSC-24 NUHOMS®-32PT NUHOMS®-24PT HI-STORM FW	07200007
Palo Verde Arizona Public Service Co.	GL	Holtec International NAC International, Inc.	NAC-UMS®	07200044
Peach Bottom Exelon Generation Co., LLC	GL	TN Americas, LLC	TN-68 07200029	
Perry FirstEnergy	GL	Holtec International	HI-STORM 100	07200069
Pilgrim Holtec Pilgrim, LLC	GL	Holtec International	HI-STORM 100	07201044
Point Beach NextEra Energy	GL	Westinghouse Electric Co. TN Americas, LLC	VSC-24 07200005 NUHOMS®-32PT	
Prairie Island Northern States Power Co., Minnesota	SL	TN Americas, LLC	TN-40 HT TN-40	07200010
Private Fuel Storage Facility	SL	Holtec International	HI-STORM 100	07200022
Quad Cities Exelon Generation Co., LLC	GL	Holtec International	HI-STORM 100S	07200053
Rancho Seco Sacramento Municipal Utility District	SL	TN Americas, LLC	NUHOMS®-24PT	07200011
R.E. Ginna Constellation Energy	GL	TN Americas, LLC	NUHOMS®-32PT	07200067
River Bend Entergy Nuclear Operations, Inc.	GL	Holtec International	HI-STORM 100S	07200049
Salem PSEG Nuclear (Duplicate, see Hope Creek)	GL	Holtec International	HI-STORM 100	07200048
San Onofre Southern California Edison Co.	GL	TN Americas, LLC Holtec International	NUHOMS®-24PT4 NUHOMS®-24PT1 HI-STORM UMAX	07200041

APPENDIX M

Dry Cask Spent Fuel Storage Licensees (continued)

Name Licensee	License Type	Vendor	Storage Model	Docket Number
Seabrook FPL Energy	GL	TN Americas, LLC	NUHOMS®-HD-32PTH	07200063
Sequoyah Tennessee Valley Authority	GL	Holtec International	HI-STORM 100 HI-STORM FW HI-STORM 100S	07200034
South Texas Project STP Nuclear Operating Co.	GL	Holtec International	HI-STORM FW	07201041
St. Lucie Florida Power & Light Co.	GL	TN Americas, LLC	NUHOMS®-HD-32PTH	07200061
Surry	SL	TN Americas, LLC	NUHOMS®HD	07200002
Virginia Electric & Power Co. (Dominion Energy Virginia)	GL	TN Americas, LLC Gesellschaft für Nuklear-Service NAC International, Inc. Westinghouse Electric Co	NUHOMS®HD-32PTH Castor NAC-128 MC-10	07200055
Susquehanna Pennsylvania Power & Light Co.	GL	TN Americas, LLC	NUHOMS®-52B NUHOMS®-61BT NUHOMS®-61BTH	07200028
Three Mile Island, Unit 1 Exelon Generation Co. LLC	GL	NAC International, Inc.	NAC MAGNASTOR	07200077
Trojan Portland General Electric Corp.	SL	Holtec International	HI-STORM 100	07200017
Turkey Point ISFSI Florida Power & Light Co.	GL	TN Americas, LLC	NUHOMS®-HD-32PTH	07200062
Vermont Yankee NorthStar Vermont Yankee, LLC	GL	Holtec International	HI-STORM 100	07200059
Virgil C. Summer South Carolina Electric & Gas	GL	Holtec International	HI-STORM FW	07201038
Vogtle Southern Nuclear Operating Co. Inc.	GL	Holtec International	HI-STORM 100S	07201039
Waterford Steam Electric Station Entergy Nuclear Operations, Inc.	GL	Holtec International	HI-STORM 100	07200075
Watts Bar Tennessee Valley Authority	GL	Holtec International	HI-STORM FW	07201048
WCS Consolidated Interim Storage Facility, CISF Interim Storage Partners, LLC	SL	TN Americas, LLC NAC International, Inc.	NUHOMS®-MP187 NUHOMS 24PT1 NUHOMS 61BT NUHOMS 61BTH NAC-MPC NAC-UMS® MAGNASTOR®	07201050

APPENDIX M

Dry Cask Spent Fuel Storage Licensees (continued)

Name Licensee	License Type	Vendor	Storage Model	Docket Number
Wolf Creek Wolf Creek Nuclear Operating Corp.	GL	TN Americas LLC	NUHOMS EOS	07200079
Yankee Rowe Yankee Atomic Electric	GL	NAC International, Inc.	NAC-MPC	07200031
Zion Zion Solutions, LLC	GL	NAC International, Inc.	MAGNASTOR®	07201037

* Fort St. Vrain independent spent fuel storage installation (ISFSI) NRC SNM-2504 license was transferred to U.S. Department of Energy on June 4, 1999. License Types: SL = site-specific license, GL = general license
 Notes: NRC-abbreviated unit names. Data are current as of September 2022.

APPENDIX N

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

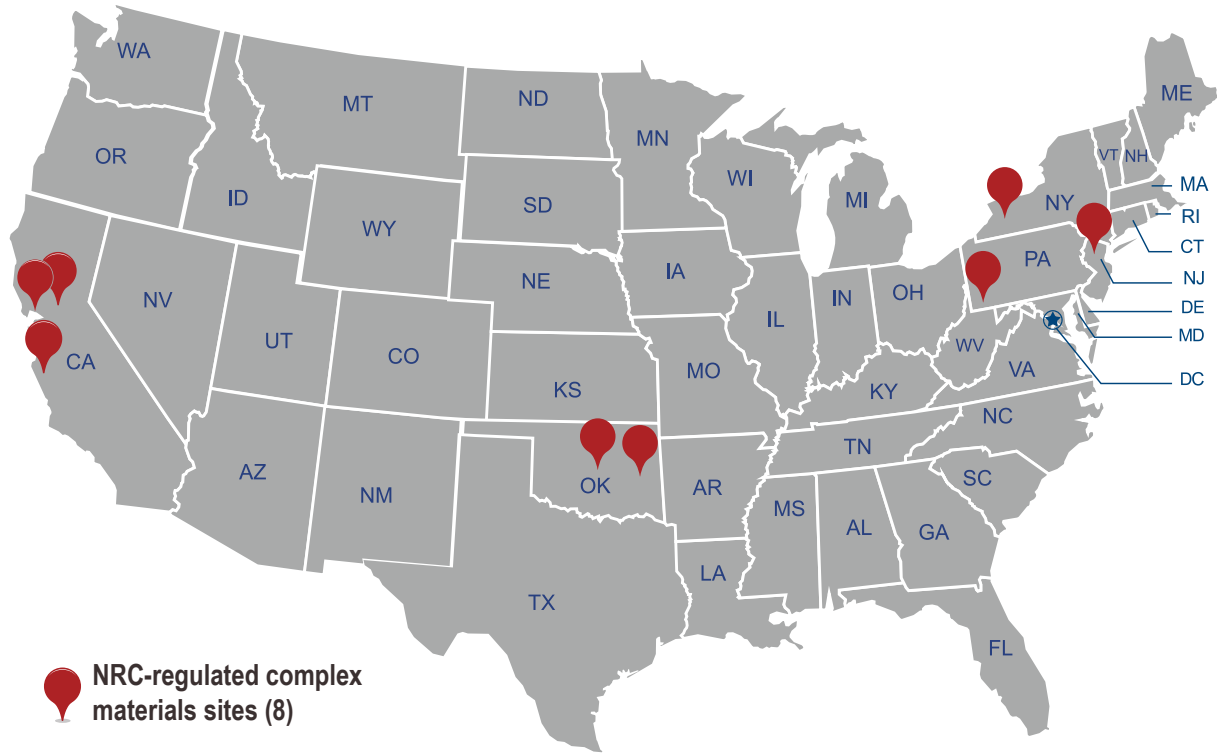
Closed Low-Level Radioactive Waste Disposal Facility Sites Licensed by the NRC or Agreement States

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

* Site of an active low-level waste disposal facility.
Note: Data are current as of September 2022.

APPENDIX O

NRC-Regulated Complex Materials Sites Undergoing Decommissioning

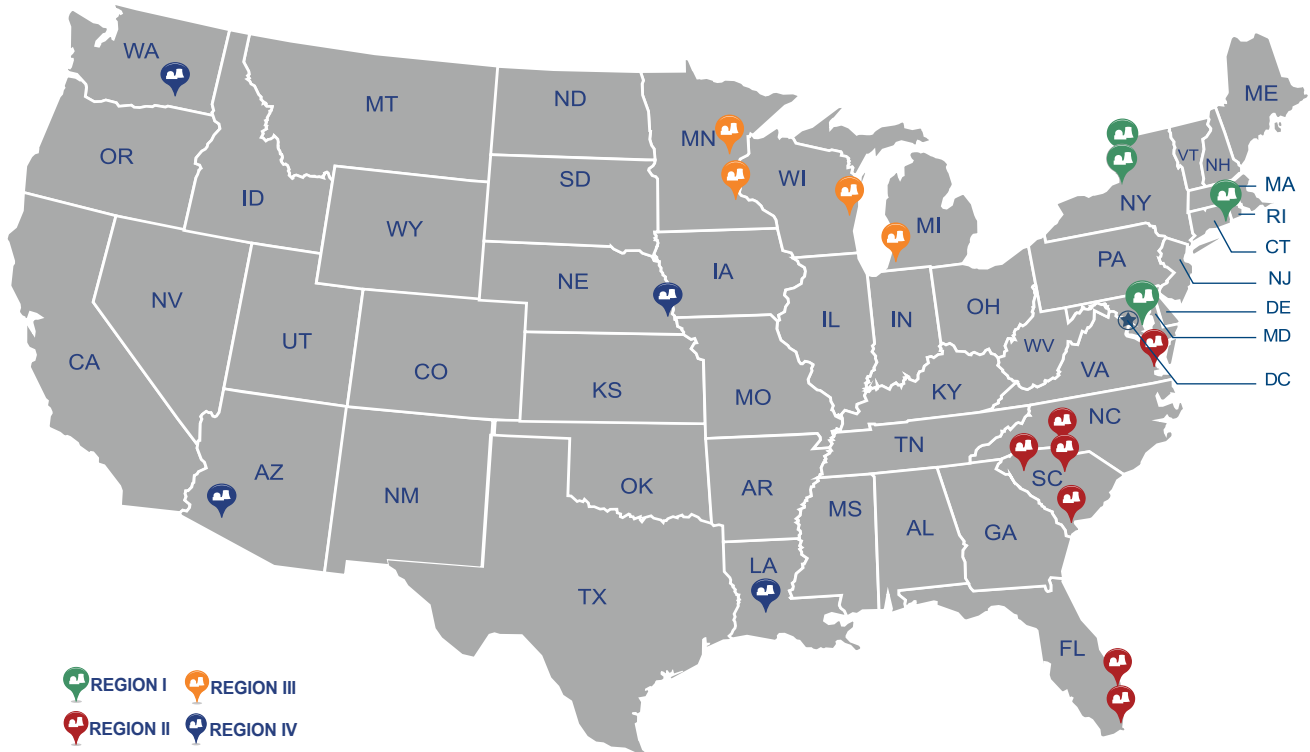


Company	Location
Alameda Naval Air Station	Alameda, CA
BWX Technology, Inc., Shallow Land Disposal Area	Vandergrift, PA
Cimarron Environmental Response Trust	Cimarron City, OK
Department of the Army, Picatinny Arsenal (ARDEC)	Picatinny, NJ
Fansteel Metals (Formerly FMRI)	Muskogee, OK
Hunter's Point Naval Shipyard	San Francisco, CA
McClellan Air Force Base	Sacramento, CA
West Valley Demonstration Project	West Valley, NY

Note: Data are current as of September 2022.

APPENDIX P

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



ARIZONA

Palo Verde

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

CONNECTICUT

Millstone

Mohegan Reservation
Mashantucket Pequot Reservation
Narragansett Reservation
Shinnecock Indian Nation

FLORIDA

St. Lucie

Brighton Reservation
(Seminole Tribes of Florida)
Fort Pierce Reservation

Turkey Point

Hollywood Reservation
(Seminole Tribes of Florida)
Miccosukee Reservation
Miccosukee Trust Land

LOUISIANA

River Bend

Tunica-Biloxi Reservation

MARYLAND

Calvert Cliffs

Rappahannock Tribe
Upper Mattaponi Tribe

MICHIGAN

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

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

Pamunkey Reservation
Chickahominy Indian Tribe
Chickahominy Indian Tribe
—Eastern Division
Nansemond Indian Tribe
Upper Mattaponi Tribe

WASHINGTON

Columbia

Yakama Reservation
Yakama Trust Land

WISCONSIN

Point Beach

Oneida Trust Land
Oneida Reservation

* Tribe is located within the 10-mile emergency preparedness zone 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, Hawaii, or U.S. Territories. For more information on other Tribal concerns, go to the NRC website at <https://www.nrc.gov>. NRC-abbreviated reactor names listed. Data as of September 30, 2022.

APPENDIX Q

States with NRC Grant Award Recipients, Fiscal Year 2022

State	Amount Awarded	Type of Grant	Academic Institution	Title of Proposal
AL	\$375,735	Fellowship	University of Alabama at Birmingham	UAB Fellowship Program for Master's in Health Physics Students
CA	\$500,000	Research and Development Grant	University of California - Los Angeles	Extending Human Reliability Analysis Methods for Explicit Inclusion of Organizational Factors: Methodology and PRA Implications
CA	\$450,000	Faculty Development	San Jose State University Research	Re-establishing Nuclear Science Research at SJSU
CO	\$400,000	Fellowship	Colorado School of Mines	Colorado School of Mines Nuclear Science and Engineering Fellowship Program
ID	\$450,000	Faculty Development	Idaho State University	Faculty Development Program in Nuclear Engineering at Idaho State University
ID	\$394,695	Fellowship	Idaho State University	Idaho State University and NRC Nuclear Science Fellowship Program
ID	\$192,390	Scholarship	Idaho State University	Idaho State University and NRC Nuclear Science Scholarship Program
IN	\$450,000	Faculty Development	Purdue University	Purdue Nuclear Engineering Junior Faculty Development Program
LA	\$199,998	Scholarship	Louisiana State University	LSU Nuclear Multidisciplinary Scholarship Program
MA	\$399,942	Fellowship	Worcester Polytechnic Institute	WPI Nuclear Science and Engineering Graduate Fellowship Program
MI	\$400,000	Fellowship	University of Michigan	Nuclear Engineering Fellowship Program at the University of Michigan
NC	\$500,000	Research and Development Grant	North Carolina State University	Trustworthiness of Digital-Twin-Based Automation Technology in Nuclear Power Plant Operation
NC	\$200,000	Scholarship	Western Carolina University	Undergraduate Research Learning Community Fostering Nuclear Workforce Development
ND	\$131,163	Trade & Community College	Bismarck State College	Trade Schools and Community College Scholarship Program
NJ	\$199,523	Scholarship	Thomas Edison State University	Thomas Edison State University Scholarship Program for Qualified Students Matriculated in Nuclear Energy Engineering, Electronics Systems Engineering Technology, Radiation Protection, Cyber Security, Technical and Information Technology Degree Programs
NM	\$500,000	Research and Development Grant	University of New Mexico	Molten Salt Spill Experiments for Validating NRC Tools in Support of Molten Salt Reactor Source Term and Accident Analyses
NV	\$450,000	Faculty Development	University of Nevada - Reno	University of Nevada, Reno Faculty Development Program in Nuclear Waste Forms
NY	\$498,770	Research and Development Grant	Rochester Institute of Technology	High-Temperature and Seismic Response of Concrete Lining Structures and Clay in Nuclear Waste Disposal
NY	\$399,168	Fellowship	City University of New York	Nuclear Energy Fellowship Program at City College of New York and Hunter College
OH	\$455,991	Research and Development Grant	University of Cincinnati	In Vivo Measurement of Low Energy Photon Associated with an Internal Deposition of Mixed Oxide Nuclear Fuel

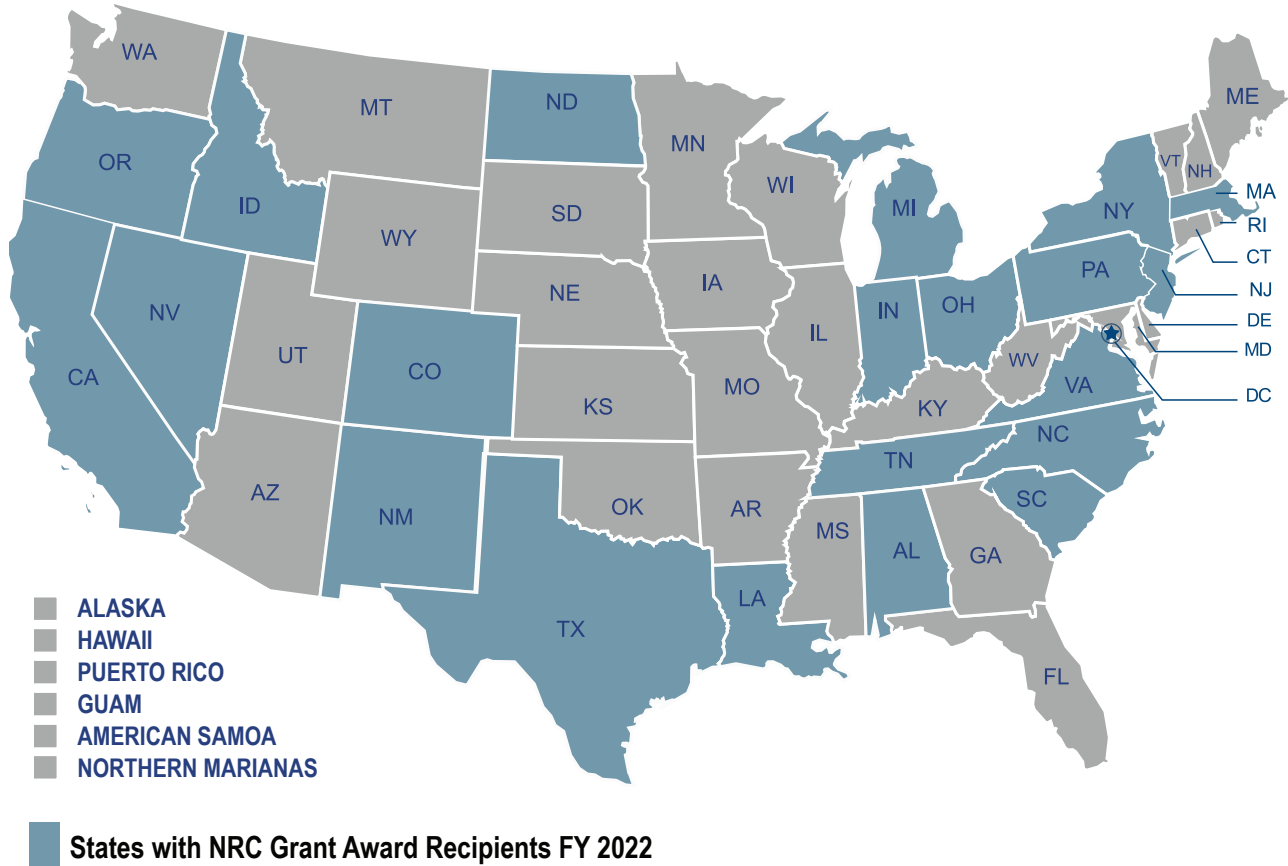
APPENDIX Q

States with NRC Grant Award Recipients, Fiscal Year 2022 (continued)

State	Amount Awarded	Type of Grant	Academic Institution	Title of Proposal
OH	\$450,000	Faculty Development	Ohio State University	The Ohio State University Nuclear Engineering Faculty Development Program
OR	\$450,000	Faculty Development	Oregon State University	Faculty Development Program in Radioactive Materials Characterization at Oregon State
OR	\$400,000	Fellowship	Oregon State University	Oregon State University Nuclear Science Fellowship Program
PA	\$500,000	Research and Development Grant	University of Pittsburgh	Nuclear-Specific Experimental and Computational Benchmark Problems for Laser Powder Bed Fusion Additive Manufacturing
PA	\$500,000	Research and Development Grant	Pennsylvania State University	Reduced Order Modeling for Coupled Neutronics/Thermal Fluids Analysis of Molten Salt Reactors in CRAB to Enable Uncertainty Analysis
PA	\$450,000	Faculty Development	Pennsylvania State University	Faculty Development Grant for Radiochemistry and Applications of Neutron Irradiation
PA	\$400,000	Fellowship	Pennsylvania State University	Fellowship Grant for Nuclear Engineering Graduate Students at Pennsylvania State University
SC	\$499,859	Research and Development Grant	Clemson University	Coupling Life-Cycle Impact Assessment and Risk Assessment for Sustainability-Informed Decision Making
SC	\$450,000	Faculty Development	Clemson University	Junior Faculty Position in Actinide Chemistry at Clemson University
SC	\$400,000	Fellowship	Clemson University	U.S. NRC Fellowship Education Grant at Clemson University
TN	\$500,000	Research and Development Grant	University of Tennessee	Validation and Testing of NRC Tools for Accident Tolerant Fuel Behavior in Reactivity-Initiated Accidents Using Separate Effects Test Data
TN	\$450,000	Faculty Development	University of Tennessee	Faculty Development Program in Nuclear Fusion Safety at the University of Tennessee
TX	\$500,000	Research and Development Grant	University of Texas at Austin	Advanced Condition Monitoring of Dry Storage Canisters by Helical Guided Ultrasonic Waves
TX	\$450,000	Faculty Development	Texas A&M University	Faculty Development Program in Nuclear Engineering at Texas A&M University
VA	\$499,996	Research and Development Grant	Virginia Polytechnic Institute	A Comprehensive Experimental and Modeling Study of Annular Two-Phase Flow
VA	\$450,000	Faculty Development	Virginia Polytechnic Institute	Virginia Tech Multi-campus Nuclear Engineering Faculty Development Program

APPENDIX Q

States with NRC Grant Award Recipients, Fiscal Year 2022 (continued)



APPENDIX R

Significant Enforcement Actions Issued, Fiscal Year 2022

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

Action #	Name	Type	Issue Date	Enforcement Action
IA-21-043	Ms. Lilly Porter	Individual	10/7/2021	SLIII/NOV
EA-21-058	Empire Paving Inc.	Materials	11/8/2021	SLIII Problem/NOV; SLIII/NOV
EA-21-109	Southern Nuclear Operating Co. (Vogtle Electric Generating Plant)	Reactor	11/17/2021	(2) White/NOV
EA-21-102	BRL-NDT Services	Materials	11/26/2021	SLIII Problem/NOV/SLIV
IA-21-049	Ms. Peggy Lucky	Individual	11/26/2021	SLIII/NOV
EA-21-034	Mountain View Hospital	Materials	12/15/2021	SLIII Problem/NOV; (4) SLIV
EA-20-125	Entergy Operations, Inc. (Grand Gulf Nuclear Station)	Reactor	12/15/2021	SLIII/NOV
IA-20-054	Mr. Maurice Omaitis	Individual	12/15/2021	SLIII/NOV
EA-21-115	Department of Army	Materials	1/3/2022	SLIII/NOV
EA-21-026	Southern Nuclear Operating Co. (Vogtle Electric Generating Plant)	Reactor	1/4/2022	SLIII/NOV
IA-21-050	Mr. Michael Giles	Individual	1/4/2022	SLIII/NOV
EA-21-119	KRONUS, Inc.	Materials	1/25/2022	SLIII/NOV
EA-21-041	Holtec Decommissioning International LLC (Oyster Creek Nuclear Generating Station)	Reactor	1/26/2022	Confirmatory Order result of an ADR mediation/CP \$50,000
IA-21-040	Mr. Kevin Wright	Individual	1/26/2022	SLIII/NOV
IA-21-051	Mr. Magnus Quitmeyer	Individual	1/27/2022	SLIII/NOV
EA-21-114	Union Carbide Corporation	Materials	2/14/2022	SLIII/NOV; (3) SLIV
EA-21-134	Geotechnical and Materials Engineers, Inc.	Materials	2/14/2022	SLIII Problem/NOV/SLIV
EA-21-120	Marian Medical LLC	Materials	2/16/2022	SLIII Problem/NOV/CP \$7,000
EA-21-133	Acuren Inspection, Inc.	Materials	2/28/2022	SLIII Problem/NOV/CP \$16,000
EA-21-155	Energy Harbor Nuclear Corp. (Davis-Besse Nuclear Power Station)	Reactor	3/1/2022	White/NOV
EA-21-045	Steel City Gamma, LLC	Materials	3/2/2022	SLII Problem/NOV/CP \$25,600
IA-21-062	Mr. Joseph Berkich	Individual	3/2/2022	Order banning for 5 years
EA-21-146	Somat Engineering Inc.	Materials	3/3/2022	Confirmatory Order result of an ADR mediation
EA-21-103	Cultilux	Materials	3/14/2022	SLIII Problem/NOV
EA-21-145	Northwest Inspection, Inc.	Materials	3/14/2022	SLIII/NOV

APPENDIX R

Significant Enforcement Actions Issued, Fiscal Year 2022 (continued)

Action #	Name	Type	Issue Date	Enforcement Action
EA-21-100	Kakivik Asset Management, LLC	Materials	4/5/2022	SLIII Problem/NOV
EA-21-059	U.S. Department of Veterans Affairs	Materials	4/21/2022	Confirmatory Order result of an ADR mediation
EA-21-132	Defense Health Agency	Materials	4/27/2022	SLIII/NOV/CP \$3,500
EA-22-001	University of Wyoming	Materials	5/17/2022	SLIII Problem/NOV
EA-21-027	Avera McKennan	Materials	5/19/2022	Confirmatory Order result of an ADR mediation
IA-21-060	Ms. Shannon Gray	Individual	5/19/2022	Confirmatory Order result of an ADR mediation
IA-21-061	Ms. Traci Hollingshead	Individual	5/19/2022	Confirmatory Order result of an ADR mediation
EA-21-125	Industrial Nuclear Company, Inc.	Materials	5/27/2022	SLIII/NOV/SLIV
EA-22-022	Core Engineering & Consulting, Inc.	Materials	6/2/2022	(2) SLIII/NOV
IA-22-025	Mr. Matthew Carberry	Individual	6/7/2022	SLIII/NOV
EA-21-129	Advanced Inspection Technologies	Materials	6/14/2022	SLIII/NOV/CP \$8,000
IA-21-069	Ms. Sharon Busby	Individual	6/14/2022	SLIII/NOV
EA-22-021	Niowave, Inc.	Materials	6/30/2022	SLIII Problem/NOV
EA-22-020	Alt and Witzig Engineering, Inc.	Materials	7/11/2022	SLIII Problem/NOV/CP \$8,000
EA-21-148	U.S. Department of Commerce (National Institute of Standards and Technology)	Reactor	8/1/2022	Confirmatory Order result of an ADR mediation
EA-22-018	Testing Engineers & Consultants, Inc.	Materials	8/11/2022	(3) SLIII/NOV/CP \$24,000
IA-22-027	Mr. Ronald Salgado	Individual	8/12/2022	SLIII/NOV
EA-21-167	Indiana University	Materials	9/1/2022	SLIII Problem/NOV/CP \$8,000
IA-22-005	Dr. Sabah Butty	Individual	9/1/2022	SLIII/NOV
IA-22-006	Dr. Maximilian Pyko	Individual	9/1/2022	SLIII/NOV
EA-22-033	Waterford Steam Electric Station, Unit 3	Reactor	9/12/2022	White/NOV
EA-22-007	Air Force Medical Readiness Agency	Materials	9/22/2022	SLIII/NOV; (3) SLIII Problem/NOV/CP \$96,000

APPENDIX S
International Activities:
LIST OF IMPORT AND EXPORT LICENSES ISSUED, FISCAL YEAR 2022: APPENDIX P

License Number	Applicant	Docket Number
PXB14b.09	Source Production & Equipment Co., Inc.	11006034
PXB169.04	Baker Hughes Oilfield Operations, LLC	11006064
PXB178.03	JL Shepherd & Associates	11006117
PXB215b.02	ISOFLEX Radioactive, LLC	11006262
PXB220.02	Baker Hughes Oilfield Operations, Inc.	11006304
PXB221.02	NSSI/Sources & Services, Inc.	11006308
PXB221.03	NSSI/Sources & Services, Inc.	11006308
PXB224.02	ISOFLEX Radioactive, LLC	11006318
PXB230.00	Halliburton Energy Services, Inc.	11006359
PXB234.00	Weatherford International Inc. & Subsidiaries & Affiliate Companies	11006390
PXB235.01	QSA Global, Inc.	11006391
PXB237.01	Baker Hughes Oilfield Operations, Inc.	11006412
PXB241.00	Brigham and Women's Hospital	11006449
PXB242.00	Halliburton Energy Services, Inc.	11006450
PXB3.13	Nordion (Canada) Inc.	11006070
PXB6.37	Alpha-Omega Services, Inc.	11006027
PXB6.38	Alpha-Omega Services, Inc.	11006027
PXB6.39	Alpha-Omega Services, Inc.	11006027
PXB6.40	Alpha-Omega Services, Inc.	11006027

Licenses under Appendix P to 10 CFR Part 110, "Export and Import of Nuclear Equipment and Material," support the use of radioactive sealed sources for a variety of medical, industrial, research, and educational activities. Some applicants have previously obtained a combined export/import license to allow export and import of U.S.-origin sources for return back to the U.S. supplier after the source has been used. These combined licenses are no longer being issued and can no longer be amended going forward, because such imports are authorized under a general license (see 10 CFR 110.27, "General license for imports," and paragraph (1) under the definition of "Radioactive Waste" in 10 CFR 110.2). These combined import/export licenses needing amendment are converted to export-only licenses. The 2010 changes to 10 CFR Part 110 generally necessitate specific licenses for only Appendix P Category 1 and 2 exports.

Note: Data are current as of September 2022.

APPENDIX S

International Activities: (continued)

LIST OF IMPORT AND EXPORT LICENSES, FISCAL YEAR 2022: NON-APPENDIX P

License Number	Applicant	Docket Number
XB1344/01	Humboldt Scientific, Inc.	11006375
XB1356	Eckert & Ziegler Isotope Products	11006415
XCOM1047/04	Westinghouse Electric Company	11004358
XCOM1276/02	Curtiss-Wright Flow Control Service, LLC	11006135
XCOM1286/02	Curtiss-Wright Flow Control Service, LLC	11006171
XCOM1294/01	Curtiss-Wright Flow Control Corporation	11006207
XCOM1329/01	Curtiss-Wright Flow Control Service, LLC	11006355
XCOM1331	Starwin Industries	11006369
XCOM1333/01	Curtiss-Wright Flow Control Corporation	11006374
XCOM1334	General Atomics	11006381
XCOM1338	Marotta Controls, Inc.	11006408
XCOM1339	Materion Brush, Inc.	11006419
XCOM1340	Technetics Group, LLC	11006425
XCOM1345	Curtiss-Wright Flow Control Service, LLC	11006438
XCOM1350	Eaton Corporation	11006445
XCOM1352	Materion Brush, Inc.	11006452
XMAT412/04	Linde Gas & Equipment Inc.	11005876
XMAT413/04	Linde Gas & Equipment Inc.	11005877
XMAT415/05	Linde Electronics and Specialty Gases	11005907
XMAT423/04	Linde Gas & Equipment Inc.	11006029
XMAT437/02	Linde Gas & Equipment Inc.	11006238
XMAT448/03	Cambridge Isotope Laboratories Inc.	11006349
XMAT449/01	Cambridge Isotope Laboratories Inc.	11006350
XMAT451/01	Cambridge Isotope Laboratories, Inc.	11006352
XMAT456	Linde Gas North America, LLC	11006416
XR170/03	Curtiss-Wright Electro-Mechanical Corporation	11005552
XR172/05	Curtiss-Wright Electro-Mechanical Corporation	11006015
XSNM3135/06	Global Nuclear Fuel - Americas L.L.C.	11005186
XSNM3697/03	Framatome Inc.	11005959
XSNM3822	U.S. Department of Energy/NNSA	11006422
XSNM3824	Edlow Intenational Co. as Agent for X Energy, LLC	11006429

APPENDIX S

International Activities: (continued)

LIST OF IMPORT AND EXPORT LICENSES, FISCAL YEAR 2022: NON-APPENDIX P (continued)

XSNM3825	Westinghouse Electric Company LLC	11006430
XSNM3826	NBL Program Office NNSA	11006431
XSNM3827	NBL Program Office NNSA	11006433
XSNM3829	Westinghouse Electric Company LLC	11006446
XSOU8789/08	ConverDyn	11005360
XSOU8855	MP Mine Operations LLC	11006432
XW008/06	Diversified Scientific Services, Inc. (DSSI)	11005323
XW018/02	EnergySolutions Services, Inc.	11005897
XW027/01	Perma-Fix Northwest Richland, Inc.	11006380
XW028	Perma-Fix Northwest Richland, Inc.	11006420
XW029	Perma-Fix Northwest Richland, Inc.	11006421

Non-Appendix P Components Guide

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

(XCOM) denotes export of minor reactor components or other nuclear facility (e.g., nuclear fabrication) components under NRC jurisdiction (refer to 10 CFR Part 110, Appendix A, Items (5)–(9), for minor reactor components and Appendices B–K and N–O for other nuclear facility components).

(XSOU) denotes export of source material (natural or depleted uranium, thorium, a mixture of uranium and thorium

other than special nuclear material, or certain ores [e.g., tantalum and niobium that contain, by weight, 0.05 percent or more of the aforementioned materials for non-nuclear end use]).

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

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

(IW) denotes import of radioactive waste.

(XW) denotes export of radioactive waste.

Note: Data are current as of September 2022.

APPENDIX T

List of Some Major Uses of Radioisotopes in the United States

A radioisotope is an unstable isotope of an element that decays or disintegrates spontaneously, thereby emitting radiation. Approximately 5,000 natural and artificial radioisotopes have been identified. Radioisotopes come from three sources: from nature, such as radon in the air or radium in the soil; from machine-produced nuclear interactions in devices, such as linear accelerators and cyclotrons; or from nuclear reactors.

The licensing and regulation of radioisotopes in the United States are shared by the NRC, the U.S. Environmental Protection Agency (EPA), and many State governments. The EPA is also responsible for, among other things, setting air emission and drinking water standards for radionuclides. The States regulate radioactive substances that occur naturally or are produced by machines, such as linear accelerators or cyclotrons. The Food and Drug Administration (FDA) regulates the manufacture and use of linear accelerators; the States regulate their operation.

Americium-241

Used in many smoke detectors for homes and businesses; to measure levels of toxic lead in dried paint samples; to ensure uniform thickness in rolling processes like steel and paper production; and to help determine where oil wells should be drilled.

Cadmium-109

Used to analyze metal alloys for checking stock, scrap sorting.

Calcium-47

Important aid to biomedical researchers studying the cellular functions and bone formation in mammals.

Californium-252

Used to inspect airline luggage for hidden explosives, to gauge the moisture content of soil in the road construction and building industries, and to measure the moisture of materials stored in soils.

Carbon-14

Major research tool. Helps ensure potential new drugs are metabolized without forming harmful byproducts. Used in biological research, agriculture, pollution control, and archeology.

Cesium-137

Used to measure correct patient dosages of radioactive pharmaceuticals; to measure and control the liquid flow in oil pipelines; to tell researchers whether oil wells are plugged by sand; and to ensure the right fill level for packages of food, drugs, and other products. (The products in these packages do not become radioactive.)

Chromium-51

Used in research in red blood cell survival studies.

Cobalt-57

Used as a tracer to diagnose pernicious anemia.

Cobalt-60

Used to sterilize surgical instruments and to improve the safety and reliability of industrial fuel oil burners. Used in cancer treatment, food irradiation, gauges, and radiography.

Curium-244

Used in mining to analyze material excavated from pits and slurries from drilling operations.

Fluorine-18

Used for positron emission imaging in medical diagnosis.

Gallium-68

Used for positron emission imaging in medical diagnosis.

Iodine-123

Widely used to diagnose thyroid disorders and other metabolic disorders including brain function.

Iodine-125

Major diagnostic tool used in clinical tests and to diagnose thyroid disorders. Also used in biomedical research.

Iodine-129

Used to check some radioactivity counters at in vitro diagnostic testing laboratories.

Iodine-131

Used to treat thyroid disorders.

Iridium-192

Used to test the integrity of pipeline welds, boilers, and aircraft parts and in brachytherapy/tumor irradiation.

Iron-55

Used to analyze electroplating solutions and to detect the presence of sulphur in the air. Used in metabolism research.

Krypton-85

Used in indicator lights in appliances such as clothes washers and dryers, stereos, and coffee makers; to gauge the thickness of thin plastics and sheet metal, rubber, textiles, and paper; and to measure dust and pollutant levels.

Lutecium-177

Used as part of radiopharmaceuticals for treatment of cancer.

Nickel-63

Used to detect explosives, in voltage regulators and current surge protectors in electronic devices, and in electron capture detectors for gas chromatographs.

Phosphorus-32

Used in molecular biology and genetics research.

Phosphorus-33

Used in molecular biology and genetics research.

Plutonium-238

Has powered more than 20 NASA spacecraft since 1972. (The most common radioisotopes of plutonium are Pu-238, Pu-239, and Pu-240.)

Polonium-210

Reduces the static charge in production of photographic film and other materials.

Promethium-147

Used in electric blanket thermostats and to gauge the thickness of thin plastics, thin sheet metal, rubber, textiles, and paper.

Radium-226

Makes lighting rods more effective. (The most common isotopes of radium are Ra-226 and Ra-228. Radium-226 is part of the uranium decay series. Radium-228 and Ra-224 are part of the thorium decay series. All isotopes of radium are radioactive. Radium decays to produce radon gas.)

Selenium-75

Used in protein studies in life science research.

Sodium-24

Used to locate leaks in industrial pipe lines and in oil well studies.

Strontium-85

Used to study bone formation and metabolism.

Strontium-90

Used in survey meters by schools, the military, and emergency management authorities. Also used in cigarette manufacturing sensors and medical treatment.

Sulphur-35

Used in genetics and molecular biology research.

Technetium-99m

The most widely used radioactive pharmaceutical for diagnostic studies in nuclear medicine. Different chemical forms are used for brain, bone, liver, spleen, and kidney imaging and also for blood flow studies.

Thallium-201

Used in nuclear medicine for nuclear cardiology and tumor detection.

Thallium-204

Used to measure dust and pollutant levels on filter paper and to gauge the thickness of plastics, sheet metal, rubber, textiles, and paper.

Thorium-229

Helps fluorescent lights last longer.

Thorium-232

As thoriated tungsten, used in electric arc welding rods in construction, aircraft, petrochemical, and food processing equipment industries.

Thorium-230

Provides coloring and fluorescence in colored glazes and glassware.

Tritium

Major tool for biomedical research. Used for life science and drug metabolism studies to ensure the safety of potential new drugs; for luminous exit signs; for luminous dials, gauges, and wrist watches; to produce luminous paint; and for geological prospecting and hydrology.

Uranium-235

Fuel for nuclear power plants and naval nuclear propulsion systems; previously used to produce fluorescent glassware, a variety of colored glazes, and wall tiles.

Xenon-133

Used in nuclear medicine for lung ventilation and blood flow studies.

Yttrium-90

Used as microsphere brachytherapy for treatment of liver cancers.

Source: [NUREG/BR-0217, Revision 1, "The Regulation and Use of Radioisotopes in Today's World," April 2000.](#) For more information visit the following web pages:
 EPA at <https://www.epa.gov/radiation/radionuclides>
 FDA at <https://www.fda.gov/radiation-emitting-products>
 National Nuclear Data Center at <https://www.nndc.bnl.gov/>

PERIODIC TABLE OF ELEMENTS

1 H Hydrogen																	2 He Helium						
3 Li Lithium	4 Be Beryllium																	5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon
11 Na Sodium	12 Mg Magnesium																	13 Al Aluminium	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton						
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon						
55 Cs Caesium	56 Ba Barium	57 La [*] Lanthanum	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon						
87 Fr Francium	88 Ra Radium	89 Ac ^{**} Actinium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium	110 Ds Darmstadtium	111 Rg Roentgenium	112 Cn Copernicium	113 Nh Nihonium	114 Fl Flerovium	115 Mc Moscovium	116 Lv Livermorium	117 Ts Tennessine	118 Og Oganesson						

RADIOACTIVE ELEMENTS
 Radioactive elements have no stable isotopes.

[*] 58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium	71 Lu Lutetium
^{**} 90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium	103 Lr Lawrencium

