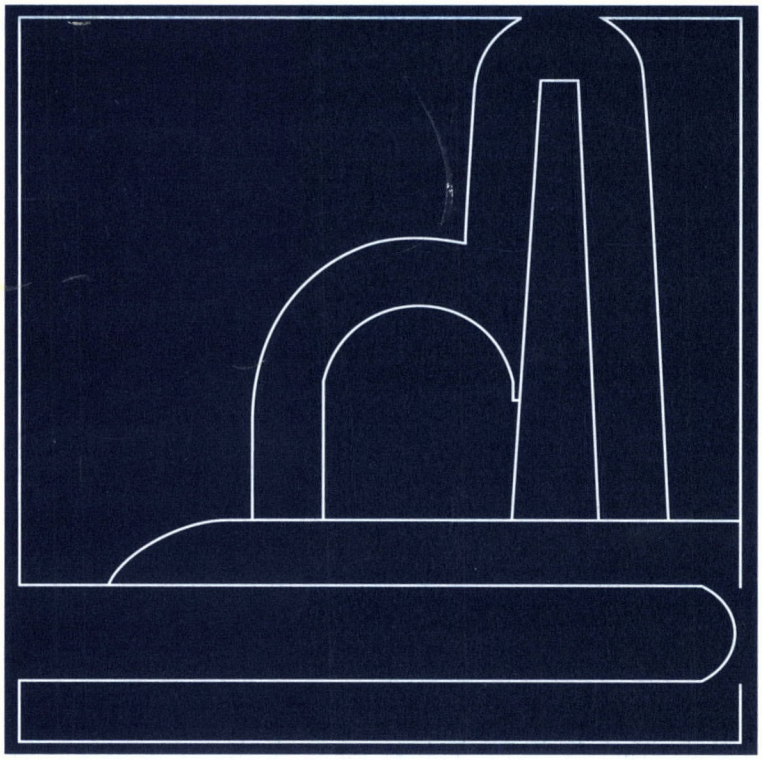
Nuclear Reactors Built, Being Built, or Planned: 1989



Prepared for:

U.S. DEPARTMENT OF ENERGY
Assistant Secretary for Nuclear Energy

Prepared by:

Office of Scientific and Technical Information

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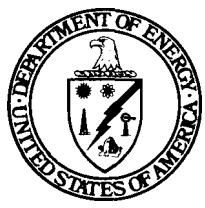
Assistant Secretary for Nuclear Energy

Division of Plans and Evaluation

Washington, D.C. 20545



Prepared by:

Office of Scientific and Technical Information

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Preface

Nuclear Reactors Built, Being Built, or Planned contains unclassified information about facilities built, being built, or planned in the United States for domestic use or export as of December 31, 1989. The Office of Scientific and Technical Information, U.S. Department of Energy, gathers this information annually from Washington headquarters and field offices of DOE, from the U.S. Nuclear Regulatory Commission, from the U.S. reactor manufacturers who are the principal nuclear contractors for foreign reactor locations, from U.S. and foreign embassies, and from foreign governmental nuclear departments.

The book is divided into three major sections: Section 1 consists of a reactor locator map and reactor tables; Section 2 includes nuclear reactors that are operating, being built, or planned; and Section 3 includes reactors that have been shut down permanently or dismantled.

Sections 2 and 3 contain the following classification of reactors: Civilian, Production, Military, Export, and Critical Assembly. Export reactor refers to a reactor for which the principal nuclear contractor is an American company—working either independently or in cooperation with a foreign company (Part IV, in each Section). Critical assembly refers to an assembly of fuel and moderator that requires an external source of neutrons to initiate and maintain fission. A critical assembly is used for experimental measurements (Part V).

The various classes of reactors within these categories are defined as follows:

Central-Station Electric Power Plant: A nuclear power facility designed and constructed for operation on a utility system (Part I, section 1A).

Dual-Purpose Plant: A nuclear power facility designed, constructed, and operated for more than one primary purpose, for example, the production of nuclear materials and the generation of electricity or the use of reactor thermal energy for electrical generation and process-heat applications including desalting (Part I, section 1B).

Experimental Power Reactor: A facility designed, engineered, constructed, and operated to test the technical feasibility of a concept or to provide the technical basis for a similar type nuclear power plant in a larger size. Design flexibility permits changes to prove various aspects of reactor technology including fuel, components, and configurations. Power-conversion equipment may or may not be included as part of the facility (Part I, section 2A).

General Irradiation Test Reactor: A reactor having (1) a thermal power level exceeding 10 MW; (2) test loops or experimental facilities within, or in proximity to, the core; and (3) the use of nuclear radiation for testing the life or performance of reactor components as its major function (Part I, section 3A, and Part IV, section 2A).

High-Power Research and Test Reactor: A reactor having a relatively high thermal power level. (5 MW or greater) but not classed as a general irradiation test reactor (Part I, section 3B).

Safety Research and Test Reactor: A reactor associated with a nuclear safety research or engineering-scale test program conducted for the purpose of developing basic design information or demonstrating safety characteristics of terrestrial and aerospace nuclear reactor systems (Part I, section 3C).

Research Reactor: A reactor—excluding that located at a university—whose nuclear radiations are used primarily as a research tool for basic or applied research and whose thermal power level is 10 MW or less. It may include facilities for testing reactor materials (Part I, section 3D; Part III, section 3B; and Part IV, section 2B).

University Research and Teaching Reactor: A reactor located at a university and usually operated for the primary purpose of training in the operation and utilization of reactors and for instruction in reactor theory and performance (Part I, section 3E, and Part IV, section 2C).

The initial commercial-operation dates for power reactors are given in Table 1. Initial criticality dates are given in Parts I through V.

Reactors are listed as *operable* under the following circumstances:

1. Reactors regulated by the NRC
   —when an operating license is issued.
   —when a reactor is temporarily shutdown because of technical reasons, modifications, or refueling.
2. Federal Government reactors
   —when criticality is achieved.
   —when a reactor is temporarily shutdown for safety improvements.
3. Reactors for export
   —when criticality is achieved.

Reactors are listed as *being built* under the following circumstances:

1. Reactors regulated by the NRC
   —when a construction permit is issued by NRC.
   —when limited work authorization is issued by NRC.
2. Federal Government reactors
   —when ground is broken.
   —when components are ordered.
   —when a construction contract is awarded.
3. Reactors for export
   —when an application for an export license is received by NRC.
   —when reliable information is received relating to the fabrication of reactor components.

Reactors are listed as planned under the following circumstances:

1. Reactors regulated by NRC
   —when a public announcement that includes the principal vendor supplier is made by the sponsoring organization.
   —when an application for a construction permit is received by NRC.
2. Federal Government reactors
   —when a public announcement is made by the agency involved.
   —when the project is otherwise appropriately authorized.
3. Reactors for export
   —when a public announcement that includes principal contractor and reactor type is made.
   —when NRC receives information that a U.S. reactor manufacturer is proceeding with preconstruction design and development on the basis of a letter of intent.

Reactors are considered to be shutdown or dismantled under the following circumstances:

1. Reactors regulated by NRC
   —when the licensee has applied to the Commission for authority to surrender a license voluntarily and to dismantle the facility and dispose of its component parts. A reactor shut down because of technical problems, modifications, or refueling continues to be listed as operable.
2. Federal Government reactors
   —when the facility has ceased operation and the agency has declared officially that the agency does not intend to operate the reactor further. However, within this category, a few reactors are identified as being in *standby* mode, the condition in which documentary authorization exists to maintain the reactor for possible future operation.
3. Reactors for export
   —when the plant is officially declared shut down by the owner and taken out of operation permanently.

Reactors and facilities shutdown or dismantled are listed in Section 3, *Reactors and Facilities Shutdown or Dismantled.*

The statistical summary (Table 2) shows the number of reactors in every category except critical facilities. Shutdown and dismantled reactors in these categories are included since such facilities have made significant contributions to reactor technology.

The reactor table column headings are defined or explained as follows:

Location—the city and state or country where located originally. For a portable facility or one that has been relocated, the most recent location is given.

Principal nuclear contractor, operator, designer, shipbuilder—the abbreviations are spelled out in Table 3, which appears just before the reactor tables.

Type—based on coolant, moderator, and neutron energy.

Power—MD Capacity [MW(e)] is the maximum dependable capacity (net electrical output to grid) for plants having an operating history. Otherwise, it is the design capacity. Licensed power and authorized power are given where appropriate.

Designation—the common name, abbreviation, or acronym used for the facility. For the naval reactors, it is the hull number.

Date columns—the initial criticality date, year of operation, and year of shutdown are given as appropriate.

Nuclear Reactors Built, Being Built, or Planned (DOE/OSTI-8200-R53) is sponsored by the DOE Office of Nuclear Energy, LaRue E. Moxley, Program Officer.

The participation and assistance of many individuals, agencies, and companies in providing data and updating the entries in this revision are gratefully acknowledged. Comments and suggestions about this publication are welcome.

To ensure that the wide range of information included in this publication will continue to be timely and accurate, please direct any information related to updating the items to William F. Simpson, Jr., Office of Scientific and Technical Information, Scientific and Technical Publications Branch, P.O. Box 62, Oak Ridge, TN 37831; (615) 576-1228 (Commercial); 626-1228 (FTS). Questions of a technical nature should be addressed to Douglas Bales at the same address.

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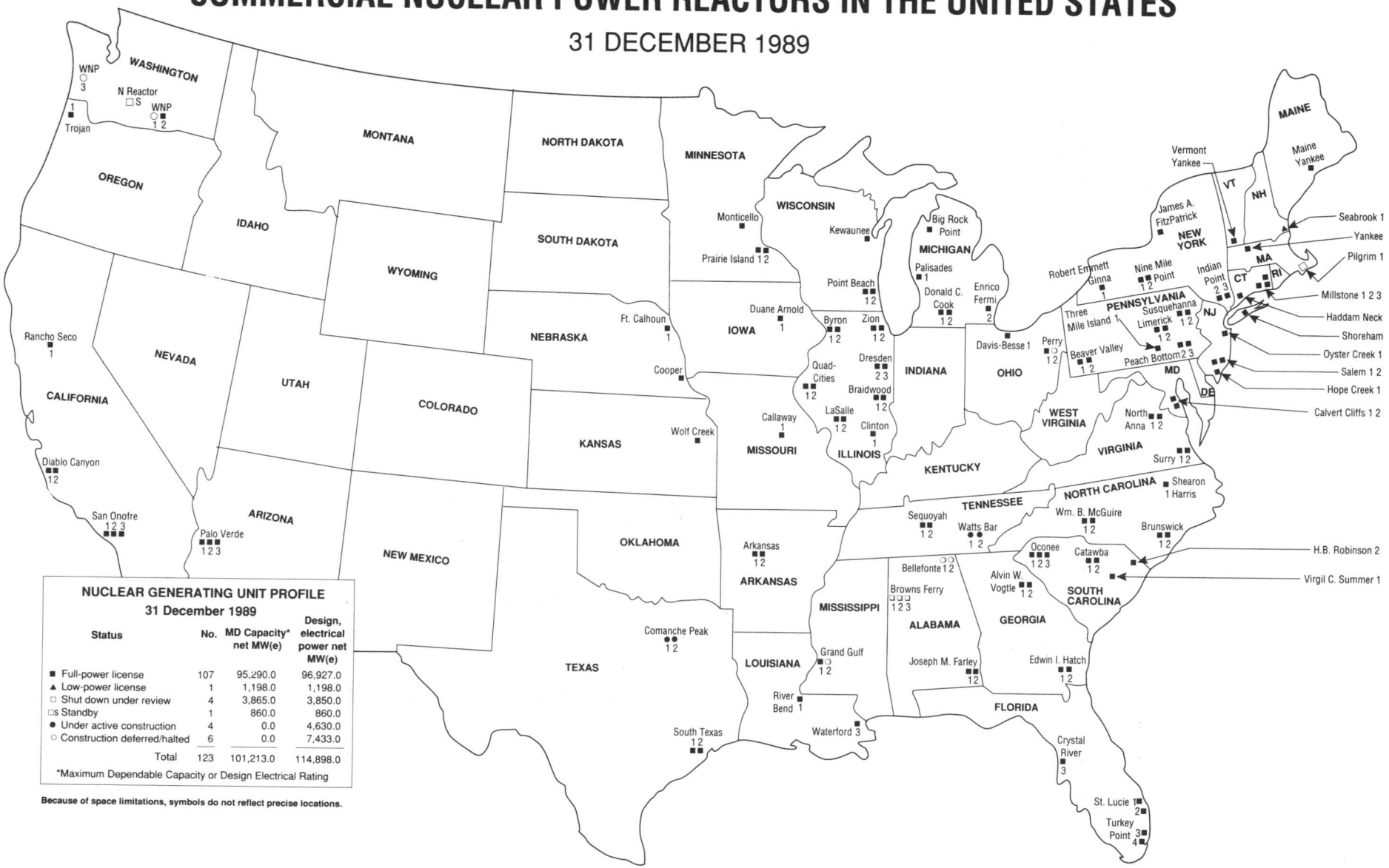
COMMERCIAL NUCLEAR POWER REACTORS IN THE UNITED STATES

31 DECEMBER 1989



NUCLEAR GENERATING UNIT PROFILE
31 December 1989

Status	No.	MD Capacity* net MW(e)	Design, electrical power net MW(e)
■ Full-power license	107	95,290.0	96,927.0
▲ Low-power license	1	1,198.0	1,198.0
□ Shut down under review	4	3,865.0	3,850.0
□s Standby	1	860.0	860.0
● Under active construction	4	0.0	4,630.0
○ Construction deferred/halted	6	0.0	7,433.0
Total	123	101,213.0	114,898.0

*Maximum Dependable Capacity or Design Electrical Rating

Because of space limitations, symbols do not reflect precise locations.

TABLE 1

COMMERCIAL NUCLEAR POWER REACTORS IN THE UNITED STATES AS OF 31 DEC 1989

SITE	PLANT NAME	STATUS	MD CAPACITY, NET MW(e)	DESIGN, ELECTRICAL POWER NET MW(e)	LICENSEE	STARTUP OR ESTIMATED STARTUP DATE
ALABAMA						
Decatur	Browns Ferry Nuclear Power Station, Unit 1	SDUR	1065.0	1065.0	Tennessee Valley Authority	73 08
Decatur	Browns Ferry Nuclear Power Station, Unit 2	SDUR	1065.0	1065.0	Tennessee Valley Authority	74 07
Decatur	Browns Ferry Nuclear Power Station, Unit 3	SDUR	1065.0	1065.0	Tennessee Valley Authority	76 08
Dothan	Joseph M. Farley Nuclear Plant, Unit 1	FPL	825.0	829.0	Alabama Power Co.	77 08
Dothan	Joseph M. Farley Nuclear Plant, Unit 2	FPL	824.0	829.0	Alabama Power Co.	81 05
Scottsboro	Bellefonte Nuclear Plant, Unit 1	CDH	0.0	1235.0	Tennessee Valley Authority	Indef.
Scottsboro	Bellefonte Nuclear Plant, Unit 2	CDH	0.0	1235.0	Tennessee Valley Authority	Indef.
Subtotal			4844.0	7323.0		
ARIZONA						
Wintersburg	Palo Verde Nuclear Generating Station, Unit 1	FPL	1221.0	1270.0	Arizona Public Service Co.	85 05
Wintersburg	Palo Verde Nuclear Generating Station, Unit 2	FPL	1221.0	1270.0	Arizona Public Service Co.	86 04
Wintersburg	Palo Verde Nuclear Generating Station, Unit 3	FPL	1304.0	1270.0	Arizona Public Service Co.	87 10
Subtotal			3746.0	3810.0		
ARKANSAS						
Russellville	Arkansas Nuclear One, Unit 1	FPL	836.0	850.0	Arkansas Power & Light Co.	74 08
Russellville	Arkansas Nuclear One, Unit 2	FPL	858.0	912.0	Arkansas Power & Light Co.	78 12
Subtotal			1694.0	1762.0		
CALIFORNIA						
Clay Station	Rancho Seco Nuclear Generating Station, Unit 1	FPL	873.0	918.0	Sacramento Municipal Utility District	74 09
Diablo Canyon	Diablo Canyon Nuclear Power Plant, Unit 1	FPL	1073.0	1086.0	Pacific Gas & Electric Co.	84 04
Diablo Canyon	Diablo Canyon Nuclear Power Plant, Unit 2	FPL	1079.0	1119.0	Pacific Gas & Electric Co.	85 08
San Clemente	San Onofre Nuclear Generating Station, Unit 1	FPL	436.0	436.0	Southern California Edison Co.	67 06
San Clemente	San Onofre Nuclear Generating Station, Unit 2	FPL	1070.0	1070.0	Southern California Edison Co.	82 07
San Clemente	San Onofre Nuclear Generating Station, Unit 3	FPL	1080.0	1080.0	Southern California Edison Co.	83 08
Subtotal			5611.0	5709.0		

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	MD CAPACITY, NET MW(e)	DESIGN, ELECTRICAL POWER NET MW(e)	LICENSEE	STARTUP OR ESTIMATED STARTUP DATE
CONNECTICUT						
Haddam Neck	Haddam Neck Plant	FPL	569.0	582.0	Connecticut Yankee Atomic Power Co.	67 07
Waterford	Millstone Nuclear Power Station, Unit 1	FPL	654.0	660.0	Northeast Nuclear Energy Co.	70 10
Waterford	Millstone Nuclear Power Station, Unit 2	FPL	857.0	870.0	Northeast Nuclear Energy Co.	75 10
Waterford	Millstone Nuclear Power Station, Unit 3	FPL	1142.0	1154.0	Northeast Nuclear Energy Co.	86 01
Subtotal			3222.0	3260.0		
FLORIDA						
Florida City	Turkey Point Plant, Unit 3	FPL	666.0	693.0	Florida Power & Light Co.	72 10
Florida City	Turkey Point Plant, Unit 4	FPL	666.0	693.0	Florida Power & Light Co.	73 06
Fort Pierce	St. Lucie Plant, Unit 1	FPL	839.0	830.0	Florida Power & Light Co.	76 04
Fort Pierce	St. Lucie Plant, Unit 2	FPL	839.0	830.0	Florida Power & Light Co.	83 06
Red Level	Crystal River Nuclear Plant, Unit 3	FPL	821.0	825.0	Florida Power Corp.	77 01
Subtotal			3831.0	3871.0		
GEORGIA						
Baxley	Edwin I. Hatch Nuclear Plant, Unit 1	FPL	750.0	776.0	Georgia Power Co.	74 09
Baxley	Edwin I. Hatch Nuclear Plant, Unit 2	FPL	761.0	784.0	Georgia Power Co.	78 07
Waynesboro	Alvin W. Vogtle Nuclear Plant, Unit 1	FPL	1101.0	1101.0	Georgia Power Co.	87 03
Waynesboro	Alvin W. Vogtle Nuclear Plant, Unit 2	FPL	1101.0	1101.0	Georgia Power Co.	89 03
Subtotal			3713.0	3762.0		
ILLINOIS						
Braidwood	Braidwood Station, Unit 1	FPL	1120.0	1120.0	Commonwealth Edison Co.	87 05
Braidwood	Braidwood Station, Unit 2	FPL	1120.0	1120.0	Commonwealth Edison Co.	88 03
Byron	Byron Station, Unit 1	FPL	1129.0	1120.0	Commonwealth Edison Co.	85 02
Byron	Byron Station, Unit 2	FPL	1129.0	1120.0	Commonwealth Edison Co.	87 01
Clinton	Clinton Power Station, Unit 1	FPL	950.0	933.0	Illinois Power Co.	87 02
Cordova	Quad-Cities Station, Unit 1	FPL	769.0	789.0	Commonwealth Edison Co.	71 10
Cordova	Quad-Cities Station, Unit 2	FPL	769.0	789.0	Commonwealth Edison Co.	72 04
Morris	Dresden Nuclear Power Station, Unit 2	FPL	772.0	794.0	Commonwealth Edison Co.	70 01
Morris	Dresden Nuclear Power Station, Unit 3	FPL	773.0	794.0	Commonwealth Edison Co.	71 01
Seneca	La Salle County Station, Unit 1	FPL	1036.0	1078.0	Commonwealth Edison Co.	82 06
Seneca	La Salle County Station, Unit 2	FPL	1036.0	1078.0	Commonwealth Edison Co.	84 03
Zion	Zion Nuclear Plant, Unit 1	FPL	1040.0	1040.0	Commonwealth Edison Co.	73 06
Zion	Zion Nuclear Plant, Unit 2	FPL	1040.0	1040.0	Commonwealth Edison Co.	73 12
Subtotal			12683.0	12815.0		

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	MD CAPACITY, NET MW(e)	DESIGN, ELECTRICAL POWER NET MW(e)	LICENSEE	STARTUP OR ESTI-MATED STARTUP DATE
IOWA						
Palo	Duane Arnold Energy Center, Unit 1	FPL	515.0	538.0	Iowa Electric Light & Power Co.	74 03
Subtotal			515.0	538.0		
KANSAS						
Burlington	Wolf Creek Generating Station	FPL	1128.0	1170.0	Kansas Gas & Electric Co.	85 05
Subtotal			1128.0	1170.0		
LOUISIANA						
St. Francisville	River Bend Station, Unit 1	FPL	936.0	936.0	Gulf States Utilities Co.	85 10
Taft	Waterford Generating Station, Unit 3	FPL	1075.0	1104.0	Louisiana Power & Light Co.	85 03
Subtotal			2011.0	2040.0		
MAINE						
Wiscasset	Maine Yankee Atomic Power Plant	FPL	810.0	825.0	Maine Yankee Atomic Power Co.	72 10
Subtotal			810.0	825.0		
MARYLAND						
Lusby	Calvert Cliffs Nuclear Power Plant, Unit 1	FPL	825.0	845.0	Baltimore Gas & Electric Co.	74 10
Lusby	Calvert Cliffs Nuclear Power Plant, Unit 2	FPL	825.0	845.0	Baltimore Gas & Electric Co.	76 11
Subtotal			1650.0	1690.0		
MASSACHUSETTS						
Plymouth	Pilgrim Nuclear Power Station, Unit 1	SDUR	670.0	655.0	Boston Edison Co.	72 06
Rowe	Yankee Nuclear Power Station	FPL	167.0	175.0	Yankee Atomic Electric Co.	60 08
Subtotal			837.0	830.0		
MICHIGAN						
Big Rock Point	Big Rock Point Nuclear Plant	FPL	69.0	72.0	Consumers Power Co.	62 09
Bridgman	Donald C. Cook Nuclear Power Plant, Unit 1	FPL	1020.0	1030.0	Indiana and Michigan Electric Co.	75 01
Bridgman	Donald C. Cook Nuclear Power Plant, Unit 2	FPL	1060.0	1100.0	Indiana and Michigan Electric Co.	78 03
Newport	Enrico Fermi Atomic Power Plant, Unit 2	FPL	1093.0	1093.0	Detroit Edison Co.	85 06
South Haven	Palisades Nuclear Plant, Unit 1	FPL	730.0	805.0	Consumers Power Co.	71 05
Subtotal			3972.0	4100.0		
MINNESOTA						
Monticello	Monticello Nuclear Generating Plant	FPL	536.0	545.0	Northern States Power Co.	70 12
Red Wing	Prairie Island Nuclear Generating Plant, Unit 1	FPL	503.0	530.0	Northern States Power Co.	73 12
Red Wing	Prairie Island Nuclear Generating Plant, Unit 2	FPL	500.0	530.0	Northern States Power Co.	74 12
Subtotal			1539.0	1605.0		

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	MD CAPACITY, NET MW(e)	DESIGN, ELECTRICAL POWER NET MW(e)	LICENSEE	STARTUP OR ESTI-MATED STARTUP DATE
MISSISSIPPI						
Port Gibson	Grand Gulf Nuclear Station, Unit 1	FPL	1142.0	1250.0	Mississippi Power & Light Co.	82 08
Port Gibson	Grand Gulf Nuclear Station, Unit 2	CDH	0.0	1250.0	Mississippi Power & Light Co.	Indef.
Subtotal			1142.0	2500.0		
MISSOURI						
Fulton	Callaway Plant, Unit 1	FPL	1120.0	1171.0	Union Electric Co.	84 10
Subtotal			1120.0	1171.0		
NEBRASKA						
Brownville	Cooper Nuclear Station	FPL	764.0	778.0	Nebraska Public Power District	74 02
Fort Calhoun	Fort Calhoun Station, Unit 1	FPL	478.0	478.0	Omaha Public Power District	73 08
Subtotal			1242.0	1256.0		
NEW HAMPSHIRE						
Seabrook	Seabrook Nuclear Station, Unit 1	LPL	1198.0	1198.0	Public Service Co. of New Hampshire	N/S
Subtotal			1198.0	1198.0		
NEW JERSEY						
Salem	Hope Creek Nuclear Generating Station, Unit 1	FPL	1067.0	1067.0	Public Service Electric & Gas Co.	86 06
Salem	Salem Nuclear Generating Station, Unit 1	FPL	1106.0	1115.0	Public Service Electric & Gas Co.	76 12
Salem	Salem Nuclear Generating Station, Unit 2	FPL	1106.0	1115.0	Public Service Electric & Gas Co.	80 08
Toms River	Oyster Creek Nuclear Power Plant, Unit 1	FPL	620.0	650.0	GPU Nuclear Corp.	69 05
Subtotal			3899.0	3947.0		
NEW YORK						
Brookhaven	Shoreham Nuclear Power Station	FPL	820.0	820.0	Long Island Lighting Co.	85 02
Buchanan	Indian Point Station, Unit 2	FPL	849.0	873.0	Consolidated Edison Co. of New York, Inc.	73 05
Buchanan	Indian Point Station, Unit 3	FPL	1000.0	965.0	New York Power Authority	76 04
Ontario	Robert Emmett Ginna Nuclear Power Plant, Unit 1	FPL	470.0	470.0	Rochester Gas & Electric Corp.	69 11
Scriba	James A. FitzPatrick Nuclear Power Plant	FPL	794.0	816.0	New York Power Authority	74 11
Scriba	Nine Mile Point Nuclear Station, Unit 1	FPL	610.0	620.0	Niagara Mohawk Power Corp.	69 09
Scriba	Nine Mile Point Nuclear Station, Unit 2	FPL	1080.0	1080.0	Niagara Mohawk Power Corp.	87 05
Subtotal			5623.0	5644.0		
NORTH CAROLINA						
Bonsal	Shearon Harris Nuclear Power Plant, Unit 1	FPL	915.0	900.0	Carolina Power & Light Co.	87 01
Cowans Ford Dam	William B. McGuire Nuclear Station, Unit 1	FPL	1150.0	1180.0	Duke Power Co.	81 08
Cowans Ford Dam	William B. McGuire Nuclear Station, Unit 2	FPL	1150.0	1180.0	Duke Power Co.	83 05

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	MD CAPACITY, NET MW(e)	DESIGN, ELECTRICAL POWER NET MW(e)	LICENSEE	STARTUP OR ESTI-MATED STARTUP DATE
Southport	Brunswick Steam Electric Plant, Unit 1	FPL	790.0	821.0	Carolina Power & Light Co.	76 10
Southport	Brunswick Steam Electric Plant, Unit 2	FPL	790.0	821.0	Carolina Power & Light Co.	75 03
Subtotal			4795.0	4902.0		
OHIO						
Oak Harbor	Davis-Besse Nuclear Power Station, Unit 1	FPL	860.0	906.0	Toledo Edison Co.	77 08
Perry	Perry Nuclear Power Plant, Unit 1	FPL	1205.0	1205.0	Cleveland Electric Illuminating Co.	86 06
Perry	Perry Nuclear Power Plant, Unit 2	CDH	0.0	1205.0	Cleveland Electric Illuminating Co.	Indef.
Subtotal			2065.0	3316.0		
OREGON						
Prescott	Trojan Nuclear Plant, Unit 1	FPL	1075.0	1130.0	Portland General Electric Co.	75 12
Subtotal			1075.0	1130.0		
PENNSYLVANIA						
Berwick	Susquehanna Steam Electric Station, Unit 1	FPL	1032.0	1050.0	Pennsylvania Power & Light Co.	82 09
Berwick	Susquehanna Steam Electric Station, Unit 2	FPL	1032.0	1050.0	Pennsylvania Power & Light Co.	84 05
Lancaster	Peach Bottom Atomic Power Station, Unit 2	FPL	1051.0	1065.0	Philadelphia Electric Co.	73 09
Lancaster	Peach Bottom Atomic Power Station, Unit 3	FPL	1035.0	1065.0	Philadelphia Electric Co.	74 08
Middletown	Three Mile Island Nuclear Station, Unit 1	FPL	776.0	819.0	GPU Nuclear Corp.	74 06
Pottstown	Limerick Generating Station, Unit 1	FPL	1055.0	1055.0	Philadelphia Electric Co.	84 12
Pottstown	Limerick Generating Station, Unit 2	FPL	1065.0	1065.0	Philadelphia Electric Co.	89 06
Shippingport	Beaver Valley Power Station, Unit 1	FPL	810.0	835.0	Duquesne Light Co., Ohio Edison Co.	76 05
Shippingport	Beaver Valley Power Station, Unit 2	FPL	852.0	836.0	Duquesne Light Co.	87 08
Subtotal			8708.0	8840.0		
SOUTH CAROLINA						
Hartsville	H.B. Robinson Plant, Unit 2	FPL	665.0	700.0	Carolina Power & Light Co.	70 09
Jenkinsville	Virgil C. Summer Nuclear Station, Unit 1	FPL	885.0	900.0	South Carolina Electric & Gas Co.	82 10
Lake Wylie	Catawba Nuclear Station, Unit 1	FPL	1145.0	1145.0	Duke Power Co.	85 01
Lake Wylie	Catawba Nuclear Station, Unit 2	FPL	1145.0	1145.0	Duke Power Co.	86 05
Seneca	Oconee Nuclear Station, Unit 1	FPL	860.0	887.0	Duke Power Co.	73 04
Seneca	Oconee Nuclear Station, Unit 2	FPL	860.0	887.0	Duke Power Co.	73 11
Seneca	Oconee Nuclear Station, Unit 3	FPL	860.0	887.0	Duke Power Co.	74 09
Subtotal			6420.0	6551.0		
TENNESSEE						
Daisy	Sequoyah Nuclear Plant, Unit 1	FPL	1148.0	1148.0	Tennessee Valley Authority	80 07

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	MD CAPACITY, NET MW(e)	DESIGN, ELECTRICAL POWER NET MW(e)	LICENSEE	STARTUP OR ESTIMATED STARTUP DATE
Daisy	Sequoyah Nuclear Plant, Unit 2	FPL	1148.0	1148.0	Tennessee Valley Authority	81 11
Spring City	Watts Bar Nuclear Plant, Unit 1	UC	0.0	1165.0	Tennessee Valley Authority	Indef.
Spring City	Watts Bar Nuclear Plant, Unit 2	UC	0.0	1165.0	Tennessee Valley Authority	Indef.
Subtotal			2296.0	4626.0		
TEXAS						
Bay City	South Texas Project, Unit 1	FPL	1250.0	1250.0	Houston Lighting & Power Co.	88 03
Bay City	South Texas Project, Unit 2	FPL	1250.0	1250.0	Houston Lighting & Power Co.	89 02
Glen Rose	Comanche Peak Steam Electric Station, Unit 1	UC	0.0	1150.0	Texas Utilities Generating Co.	90 04
Glen Rose	Comanche Peak Steam Electric Station, Unit 2	UC	0.0	1150.0	Texas Utilities Generating Co.	Indef.
Subtotal			2500.0	4800.0		
VERMONT						
Vernon	Vermont Yankee Nuclear Power Station	FPL	504.0	514.0	Vermont Yankee Nuclear Power Corp.	72 03
Subtotal			504.0	514.0		
VIRGINIA						
Gravel Neck	Surry Power Station, Unit 1	FPL	781.0	788.0	Virginia Electric & Power Co.	72 07
Gravel Neck	Surry Power Station, Unit 2	FPL	781.0	788.0	Virginia Electric & Power Co.	73 03
Mineral	North Anna Power Station, Unit 1	FPL	915.0	907.0	Virginia Electric & Power Co.	78 04
Mineral	North Anna Power Station, Unit 2	FPL	915.0	907.0	Virginia Electric & Power Co.	80 06
Subtotal			3392.0	3390.0		
WASHINGTON						
Richland	N Reactor	SB	860.0	860.0	DOE & Washington Public Power Supply System	63 12
Richland	Washington Nuclear Project, Unit 1	CDH	0.0	1266.0	Washington Public Power Supply System	Indef.
Richland	Washington Nuclear Project, Unit 2	FPL	1095.0	1100.0	Washington Public Power Supply System	84 01
Satsop	Washington Nuclear Project, Unit 3	CDH	0.0	1242.0	Washington Public Power Supply System	Indef.
Subtotal			1955.0	4468.0		
WISCONSIN						
Carlton	Kewaunee Nuclear Power Plant	FPL	503.0	535.0	Wisconsin Public Service Corp.	74 03
Two Creeks	Point Beach Nuclear Plant, Unit 1	FPL	485.0	497.0	Wisconsin Electric Power Co.	70 11
Two Creeks	Point Beach Nuclear Plant, Unit 2	FPL	485.0	497.0	Wisconsin Electric Power Co.	72 05
Subtotal			1473.0	1529.0		
Total			101213.0	114898.0		

FPL, Full-Power License.
LPL, Low-Power License.
SDUR, Shut Down Under Review.
UC, Under Active Construction.
CDH, Construction Deferred/Halted.
P, Planned.
SB, Standby.

TABLE 2

STATISTICAL SUMMARY OF NUCLEAR REACTORS AS OF DECEMBER 1989

		Operable	Being built	Planned	Shut down or dismantled
I.	**CIVILIAN REACTORS (DOMESTIC)**				
	1. Power Reactors				
	A. Central-Station Electric Power Plants	112	10		15
	B. Dual-Purpose Plants	1			
	C. Propulsion (Maritime)				1
	2. Experimental Power-Reactor Systems				
	A. Electric-Power Systems	1		1	23
	B. Space Nuclear Auxiliary Power (SNAP)			1	9
	C. Space Propulsion (Rover)				21
	3. Test, Research, and University Reactors				
	A. General Irradiation Test	2			5
	B. High-Power Research and Test	6			6
	C. Safety-Research and Test	2			9
	D. General Research	19		1	49
	E. University Research and Teaching	38		1	27
II.	**PRODUCTION REACTORS**				
	1. Materials Production	4		1	9
	2. Process Development				5
III.	**MILITARY REACTORS**				
	1. Defense Power-Reactor Applications				
	A. Remote Installations				6
	B. Propulsion (Naval)	147	26		33
	2. Developmental Power				
	A. Electric-Power Experiments and Prototypes				3
	B. Propulsion Experiments and Prototypes	7			8
	3. Test and Research				
	A. Test				3
	B. Research	3	1		6
IV.	**REACTORS FOR EXPORT**				
	1. Power Reactors				
	A. Central-Station Electric Power Plants	56	9	6	4
	B. Propulsion				1
	2. Test, Research, and Teaching				
	A. General Irradiation Test	7			
	B. General Research	27	1		9
	C. University Research and Teaching	19			6

TABLE 3 ABBREVIATIONS OF CONTRACTORS, DESIGNERS, SHIPBUILDERS, AND FACILITY OPERATORS

The definitions of the following abbreviations that have been used in this volume contain references to current and historical corporate and government structure.

AC	Allis-Chalmers Mfg. Co.
ACEC	Ateliers de Constructions Electriques de Charleroi S. A. (Belgium)
ACF	ACF Industries, Inc. (reactor activities absorbed by AC)
AEC	Atomic Energy Commission, a predecessor of the Department of Energy
AG	Aerojet-General Corporation
AGN	Aerojet-General Nucleonics, formerly a subsidiary and then a division of Aerojet-General Corporation
AI	Atomics International, a division of Rockwell International
Alco	Alco Products, Inc. (reactor activities absorbed by AC)
AMF	AMF Atomics, Inc., a division of American Machine & Foundry Co.
ANL	Argonne National Laboratory, operated by the University of Chicago
ANPD	Aircraft Nuclear Propulsion Department, General Electric Company (name changed to Flight Propulsion Laboratory Department)
AR	American Radiator
AS, Inc.	American Standard Inc.
AU, Inc.	Associated Universities, Inc. (Brookhaven National Laboratory)
BAC	Bendix Aviation Corp.
Bethlehem	Shipbuilding Division, Bethlehem Steel Co. (now Quincy Division, General Dynamics Corp.)
Bettis	Bettis Atomic Power Laboratory, operated by Westinghouse Electric Corporation
Blaw-Knox	Blaw-Knox Co.
B&R	Burns & Roe, Inc.
B&W	Babcock & Wilcox Co.
BNL	Brookhaven National Laboratory, operated by Associated Universities, Inc.
CL	Clinton Laboratory of the Manhattan Engineer District
Comb.	Combustion Engineering, Inc.
Convair	Convair Division, General Dynamics Corp.
Cook	Nucledyne Co., a division of Cook Electric Company
CW	Curtiss-Wright Corporation
Daystrom	Daystrom, Inc.
DNA	Defense Nuclear Agency, Department of Defense
DOD	Department of Defense
DOE	Department of Energy
Du Pont	E. I. Du Pont de Nemours & Company, Inc.
Ebasco	Ebasco Services, Inc.
EG&G–ID	EG&G Idaho, Inc. (a division of EG&G, Inc.)
Electric Boat	Electric Boat Division, General Dynamics Corp.
Fluor	The Fluor Corporation, Ltd.
Fram.	Framatome
FW	Foster Wheeler Corp.
GA	General Atomics Technologies
GD (Quincy)	Quincy Division, General Dynamics Corp.
GE	General Electric Company
GNEC	General Nuclear Engineering Corp. (became a division of Combustion Engineering, Inc., in 1964)
IC	Internuclear Co.
INC	Idaho Nuclear Corporation
INEL	Idaho National Engineering Laboratory
Ingalls	Ingalls Shipbuilding Corp.
Kaman	Kaman Nuclear, a division of Kaman Aircraft Corp.
KAPL	Knolls Atomic Power Laboratory, operated by General Electric Company
KE	Kaiser Engineers, a division of Henry J. Kaiser Co.
LANL	Los Alamos National Laboratory, operated by the University of California
LLNL	Lawrence Livermore National Laboratory, operated by the University of California
Lockheed	Lockheed Aircraft Corp.
Mare Island	Mare Island Naval Shipyard
Martin	Martin Marietta Corp.
Maxon	Maxon Construction Co.
Met. Lab	Metallurgical Laboratory of the Manhattan Engineer District
NASA	National Aeronautics and Space Administration
NBS	National Bureau of Standards
Newport News	Newport News Shipbuilding & Dry Dock Co.
NRDS	Nuclear Rocket Development Station
NRL	Naval Research Laboratory
NSA	Nuclear Systems Associates
NTS	Nevada Test Site
NYSC	New York Shipbuilding Corp.
ORNL	Oak Ridge National Laboratory
PNL	Pacific Northwest Laboratory, operated by Battelle Memorial Institute
Portsmouth	Portsmouth Naval Shipyard
PPC	Phillips Petroleum Co.
PRDC	Power Reactor Development Company
RI	Rockwell International
Sandia	Sandia National Laboratories, operated by Sandia Corp., a subsidiary of Western Electric Co.
SRL	Savannah River Laboratory, operated by Westinghouse Electric Corporation
UNC	United Nuclear Corporation, Development Division
Vitro	Vitro Corporation of America
West.	Westinghouse Electric Corporation
WHC	Westinghouse Hanford Co.

REACTORS AND FACILITIES OPERABLE, BEING BUILT, OR PLANNED

REACTORS AND FACILITIES OPERABLE, BEING BUILT, OR PLANNED

1. POWER REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

A. Central-Station Electric Power Plants

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Power Licensed MW(t)	Initial criticality (yr mo)	Comment
OPERABLE							
Alvin W. Vogtle Nuclear Plant, Unit 1 (Georgia Power Co.) [50-424]	Waynesboro, GA	West.	Pressurized water	1101.0	3411.0	87 03	Commercial operation, 6-1-87.
Alvin W. Vogtle Nuclear Plant, Unit 2 (Georgia Power Co.) [50-425]	Waynesboro, GA	West.	Pressurized water	1101.0	3411.0	89 03	Full-power license, 3-31-89. Commercial operation, 5-20-89.
Arkansas Nuclear One, Unit 1 (Arkansas Power & Light Co.) [50-313]	Russellville, AR	B&W	Pressurized water	836.0	2568.0	74 08	
Arkansas Nuclear One, Unit 2 (Arkansas Power & Light Co.) [50-368]	Russellville, AR	Comb.	Pressurized water	858.0	2815.0	78 12	
Beaver Valley Power Station, Unit 1 (Duquesne Light Co., Ohio Edison Co.) [50-334]	Shippingport, PA	West.	Pressurized water	810.0	2660.0	76 05	
Beaver Valley Power Station, Unit 2 (Duquesne Light Co.) [50-412]	Shippingport, PA	West.	Pressurized water	852.0	2660.0	87 08	Commercial operation, 11-17-87.
Big Rock Point Nuclear Plant (Consumers Power Co.) [50-155]	Big Rock Point, MI	GE	Boiling water	69.0	240.0	62 09	
Braidwood Station, Unit 1 (Commonwealth Edison Co.) [50-456]	Braidwood, IL	West.	Pressurized water	1120.0	3411.0	87 05	Full-power license, 7-2-87. Commercial operation, 7-29-88.
Braidwood Station, Unit 2 (Commonwealth Edison Co.) [50-457]	Braidwood, IL	West.	Pressurized water	1120.0	3411.0	88 03	Full-power license, 5-20-88. Commercial operation, 10-17-88.
Browns Ferry Nuclear Power Station, Unit 1 (Tennessee Valley Authority) [50-259]	Decatur, AL	GE	Boiling water	1065.0	3293.0	73 08	Shut down 6-1-85: administrative hold to resolve various TVA and NRC concerns.
Browns Ferry Nuclear Power Station, Unit 2 (Tennessee Valley Authority) [50-260]	Decatur, AL	GE	Boiling water	1065.0	3293.0	74 07	Shut down 9-15-84: administrative hold to resolve various TVA and NRC concerns.
Browns Ferry Nuclear Power Station, Unit 3 (Tennessee Valley Authority) [50-296]	Decatur, AL	GE	Boiling water	1065.0	3293.0	76 08	Shut down 3-3-85: administrative hold to resolve various TVA and NRC concerns.
Brunswick Steam Electric Plant, Unit 1 (Carolina Power & Light Co.) [50-325]	Southport, NC	GE	Boiling water	790.0	2436.0	76 10	
Brunswick Steam Electric Plant, Unit 2 (Carolina Power & Light Co.) [50-324]	Southport, NC	GE	Boiling water	790.0	2436.0	75 03	
Byron Station, Unit 1 (Commonwealth Edison Co.) [50-454]	Byron, IL	West.	Pressurized water	1129.0	3411.0	85 02	
Byron Station, Unit 2 (Commonwealth Edison Co.) [50-455]	Byron, IL	West.	Pressurized water	1129.0	3411.0	87 01	Full-power license, 1-30-87. Commercial operation, 8-21-87

A. Central-Station Electric Power Plants (Continued)

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Power Licensed MW(t)	Initial criticality (yr mo)	Comment
OPERABLE (Continued)							
Callaway Plant, Unit 1 (Union Electric Co.) [50-483]	Fulton, MO	West.	Pressurized water	1120.0	3565.0	84 10	
Calvert Cliffs Nuclear Power Plant, Unit 1 (Baltimore Gas & Electric Co.) [50-317]	Lusby, MD	Comb.	Pressurized water	825.0	2700.0	74 10	
Calvert Cliffs Nuclear Power Plant, Unit 2 (Baltimore Gas & Electic Co.) [50-318]	Lusby, MD	Comb.	Pressurized water	825.0	2700.0	76 11	
Catawba Nuclear Station, Unit 1 (Duke Power Co.) [50-413]	Lake Wylie, SC	West.	Pressurized water	1145.0	3411.0	85 01	
Catawba Nuclear Station, Unit 2 (Duke Power Co.) [50-414]	Lake Wylie, SC	West.	Pressurized water	1145.0	3411.0	86 05	
Clinton Power Station, Unit 1 (Illinois Power Co.) [50-461]	Clinton, IL	GE	Boiling water	950.0	2894.0	87 02	Full-power license, 4-17-87. Commercial operation, 11-24-87.
Cooper Nuclear Station (Nebraska Public Power District) [50-298]	Brownville, NE	GE	Boiling water	764.0	2381.0	74 02	
Crystal River Nuclear Plant, Unit 3 (Florida Power Corp.) [50-302]	Red Level, FL	B&W	Pressurized water	821.0	2544.0	77 01	
Davis-Besse Nuclear Power Station, Unit 1 (Toledo Edison Co.) [50-346]	Oak Harbor, OH	B&W	Pressurized water	860.0	2772.0	77 08	
Diablo Canyon Nuclear Power Plant, Unit 1 (Pacific Gas & Electric Co.) [50-275]	Diablo Canyon, CA	West.	Pressurized water	1073.0	3338.0	84 04	
Diablo Canyon Nuclear Power Plant, Unit 2 (Pacific Gas & Electric Co.) [50-323]	Diablo Canyon, CA	West.	Pressurized water	1079.0	3411.0	85 08	
Donald C. Cook Nuclear Power Plant, Unit 1 (Indiana and Michigan Electric Co.) [50-315]	Bridgman, MI	West.	Pressurized water	1020.0	3250.0	75 01	
Donald C. Cook Nuclear Power Plant, Unit 2 (Indiana and Michigan Electric Co.) [50-316]	Bridgman, MI	West.	Pressurized water	1060.0	3411.0	78 03	
Dresden Nuclear Power Station, Unit 2 (Commonwealth Edison Co.) [50-237]	Morris, IL	GE	Boiling water	772.0	2527.0	70 01	
Dresden Nuclear Power Station, Unit 3 (Commonwealth Edison Co.) [50-249]	Morris, IL	GE	Boiling water	773.0	2527.0	71 01	
Duane Arnold Energy Center, Unit 1 (Iowa Electric Light & Power Co.) [50-331]	Palo, IA	GE	Boiling water	515.0	1658.0	74 03	
Edwin I. Hatch Nuclear Plant, Unit 1 (Georgia Power Co.) [50-321]	Baxley, GA	GE	Boiling water	750.0	2436.0	74 09	
Edwin I. Hatch Nuclear Plant, Unit 2 (Georgia Power Co.) [50-366]	Baxley, GA	GE	Boiling water	761.0	2436.0	78 07	
Enrico Fermi Atomic Power Plant, Unit 2 (Detroit Edison Co.) [50-341]	Newport, MI	GE	Boiling water	1093.0	3292.0	85 06	

Fort Calhoun Station, Unit 1 (Omaha Public Power District) [50-285]	Fort Calhoun, NE	Comb.	Pressurized water	478.0	1500.0	73 08	
Grand Gulf Nuclear Station, Unit 1 (Mississippi Power & Light Co.) [50-416]	Port Gibson, MS	GE	Boiling water	1142.0	3833.0	82 08	
H.B. Robinson Plant, Unit 2 (Carolina Power & Light Co.) [50-261]	Hartsville, SC	West.	Pressurized water	665.0	2300.0	70 09	
Haddam Neck Plant (Connecticut Yankee Atomic Power Co.) [50-213]	Haddam Neck, CT	West.	Pressurized water	569.0	1825.0	67 07	
Hope Creek Nuclear Generating Station, Unit 1 (Public Service Electric & Gas Co.) [50-354]	Salem, NJ	GE	Boiling water	1067.0	3293.0	86 06	Full-power license, 7-25-86. Commercial operation, 12-20-86.
Indian Point Station, Unit 2 (Consolidated Edison Co. of New York, Inc.) [50-247]	Buchanan, NY	West.	Pressurized water	849.0	2758.0	73 05	
Indian Point Station, Unit 3 (New York Power Authority) [50-286]	Buchanan, NY	West.	Pressurized water	1000.0	3025.0	76 04	
James A. FitzPatrick Nuclear Power Plant (New York Power Authority) [50-333]	Scriba, NY	GE	Boiling water	794.0	2436.0	74 11	
Joseph M. Farley Nuclear Plant, Unit 1 (Alabama Power Co.) [50-348]	Dothan, AL	West.	Pressurized water	825.0	2652.0	77 08	
Joseph M. Farley Nuclear Plant, Unit 2 (Alabama Power Co.) [50-364]	Dothan, AL	West.	Pressurized water	824.0	2652.0	81 05	
Kewaunee Nuclear Power Plant (Wisconsin Public Service Corp.) [50-305]	Carlton, WI	West.	Pressurized water	503.0	1650.0	74 03	
La Salle County Station, Unit 1 (Commonwealth Edison Co.) [50-373]	Seneca, IL	GE	Boiling water	1036.0	3323.0	82 06	
La Salle County Station, Unit 2 (Commonwealth Edison Co.) [50-374]	Seneca, IL	GE	Boiling water	1036.0	3323.0	84 03	
Limerick Generating Station, Unit 1 (Philadelphia Electric Co.) [50-352]	Pottstown, PA	GE	Boiling water	1055.0	3293.0	84 12	Commercial operation, 2-1-86.
Limerick Generating Station, Unit 2 (Philadelphia Electric Co.) [50-353]	Pottstown, PA	GE	Boiling water	1065.0	3293.0	89 12	Full-power license, 8-25-89. Commercial operation, 1-8-90.
Maine Yankee Atomic Power Plant (Maine Yankee Atomic Power Co.) [50-309]	Wiscasset, ME	Comb.	Pressurized water	810.0	2630.0	72 10	
Millstone Nuclear Power Station, Unit 1 (Northeast Nuclear Energy Co.) [50-245]	Waterford, CT	GE	Boiling water	654.0	2011.0	70 10	
Millstone Nuclear Power Station, Unit 2 (Northeast Nuclear Energy Co.) [50-336]	Waterford, CT	Comb.	Pressurized water	857.0	2700.0	75 10	
Millstone Nuclear Power Station, Unit 3 (Northeast Nuclear Energy Co.) [50-423]	Waterford, CT	West.	Pressurized water	1142.0	3411.0	86 01	Commercial operation, 4-23-86.
Monticello Nuclear Generating Plant (Northern States Power Co.) [50-263]	Monticello, MN	GE	Boiling water	536.0	1670.0	70 12	
Nine Mile Point Nuclear Station, Unit 1 (Niagara Mohawk Power Corp.) [50-220]	Scriba, NY	GE	Boiling water	610.0	1850.0	69 09	

A. Central-Station Electric Power Plants (Continued)

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Power Licensed MW(t)	Initial criticality (yr mo)	Comment
OPERABLE (Continued)							
Nine Mile Point Nuclear Station, Unit 2 (Niagara Mohawk Power Corp.) [50-410]	Scriba, NY	GE	Boiling water	1080.0	3323.0	87 05	Full-power license, 7-2-87. Commercial operation, 4-5-88.
North Anna Power Station, Unit 1 (Virginia Electric & Power Co.) [50-338]	Mineral, VA	West.	Pressurized water	915.0	2893.0	78 04	
North Anna Power Station, Unit 2 (Virginia Electric & Power Co.) [50-339]	Mineral, VA	West.	Pressurized water	915.0	2893.0	80 06	
Oconee Nuclear Station, Unit 1 (Duke Power Co.) [50-269]	Seneca, SC	B&W	Pressurized water	860.0	2568.0	73 04	
Oconee Nuclear Station, Unit 2 (Duke Power Co.) [50-270]	Seneca, SC	B&W	Pressurized water	860.0	2568.0	73 11	
Oconee Nuclear Station, Unit 3 (Duke Power Co.) [50-287]	Seneca, SC	B&W	Pressurized water	860.0	2568.0	74 09	
Oyster Creek Nuclear Power Plant, Unit 1 (GPU Nuclear Corp.) [50-219]	Toms River, NJ	GE	Boiling water	620.0	1930.0	69 05	
Palisades Nuclear Plant, Unit 1 (Consumers Power Co.) [50-255]	South Haven, MI	Comb.	Pressurized water	730.0	2530.0	71 05	
Palo Verde Nuclear Generating Station, Unit 1 (Arizona Public Service Co.) [50-528]	Wintersburg, AZ	Comb.	Pressurized water	1221.0	3800.0	85 05	Commercial operation, 2-13-86.
Palo Verde Nuclear Generating Station, Unit 2 (Arizona Public Service Co.) [50-529]	Wintersburg, AZ	Comb.	Pressurized water	1221.0	3800.0	86 04	Commercial operation, 9-22-86.
Palo Verde Nuclear Generating Station, Unit 3 (Arizona Public Service Co.) [50-530]	Wintersburg, AZ	Comb.	Pressurized water	1304.0	3817.0	87 10	Commercial operation, 1-8-88.
Peach Bottom Atomic Power Station, Unit 2 (Philadelphia Electric Co.) [50-277]	Lancaster, PA	GE	Boiling water	1051.0	3293.0	73 09	Restart authorized, 4-26-89.
Peach Bottom Atomic Power Station, Unit 3 (Philadelphia Electric Co.) [50-278]	Lancaster, PA	GE	Boiling water	1035.0	3293.0	74 08	Restart authorized, 10-05-89.
Perry Nuclear Power Plant, Unit 1 (Cleveland Electric Illuminating Co.) [50-440]	Perry, OH	GE	Boiling water	1205.0	3579.0	86 06	Full-power license, 11-13-86. Commercial operation, 11-18-87.
Pilgrim Nuclear Power Station, Unit 1 (Boston Edison Co.) [50-293]	Plymouth, MA	GE	Boiling water	670.0	1998.0	72 06	Restart authorized, 12-30-88.
Point Beach Nuclear Plant, Unit 1 (Wisconsin Electric Power Co.) [50-266]	Two Creeks, WI	West.	Pressurized water	485.0	1518.0	70 11	

Point Beach Nuclear Plant, Unit 2 (Wisconsin Electric Power Co.) [50-301]	Two Creeks, WI	West.	Pressurized water	485.0	1518.0	72 05	
Prairie Island Nuclear Generating Plant, Unit 1 (Northern States Power Co.) [50-282]	Red Wing, MN	West.	Pressurized water	503.0	1650.0	73 12	
Prairie Island Nuclear Generating Plant, Unit 2 (Northern States Power Co.) [50-306]	Red Wing, MN	West.	Pressurized water	500.0	1650.0	74 12	
Quad-Cities Station, Unit 1 (Commonwealth Edison Co.) [50-254]	Cordova, IL	GE	Boiling water	769.0	2511.0	71 10	
Quad-Cities Station, Unit 2 (Commonwealth Edison Co.) [50-265]	Cordova, IL	GE	Boiling watter	769.0	2511.0	72 04	
Rancho Seco Nuclear Generating Station, Unit 1 (Sacramento Municipal Utility District) [50-312]	Clay Station, CA	B&W	Pressurized water	873.0	2772.0	74 09	Plant shut down 6-7-89 because of public vote.
River Bend Station, Unit 1 (Gulf States Utilities Co.) [50-458]	St. Francisville, LA	GE	Boiling water	936.0	2894.0	85 10	Commercial operation, 6-16-86.
Robert Emmett Ginna Nuclear Power Plant, Unit 1 (Rochester Gas & Electric Corp.) [50-244]	Ontario, NY	West.	Pressurized water	470.0	1520.0	69 11	
Salem Nuclear Generating Station, Unit 1 (Public Service Electric & Gas Co.) [50-272]	Salem, NJ	West.	Pressurized water	1106.0	3411.0	76 12	
Salem Nuclear Generating Station, Unit 2 (Public Service Electric & Gas Co.) [50-311]	Salem, NJ	West.	Pressurized water	1106.0	3411.0	80 08	
San Onofre Nuclear Generating Station, Unit 1 (Southern California Edison) [50-206]	San Clemente, CA	West.	Pressurized water	436.0	1347.0	67 06	
San Onofre Nuclear Generating Station, Unit 2 (Southern California Edison) [50-361]	San Clemente, CA	Comb.	Pressurized water	1070.0	3390.0	82 07	
San Onofre Nuclear Generating Station, Unit 3 (Southern California Edison) [50-362]	San Clemente, CA	Comb.	Pressurized water	1080.0	3390.0	83 08	
Seabrook Nuclear Station, Unit 1 (Public Service Co. of New Hampshire) [50-443]	Seabrook, NH	West.	Pressurized water	1198.0	3411.0	N/S	Low-power license, 5-26-89.
Sequoyah Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-327]	Daisy, TN	West.	Pressurized water	1148.0	3411.0	80 07	Shut down 12-20-85: design control, configuration updating, and employee concerns. Restarted 11-05-88.
Sequoyah Nuclear Plant, Unit 2 (Tennessee Valley Authority) [50-328]	Daisy, TN	West.	Pressurized water	1148.0	3411.0	81 11	Shut down, 8-21-85: design control, configuration updating, and employee concerns. Restarted, 3-30-88.
Shearon Harris Nuclear Power Plant, Unit 1 (Carolina Power & Light Co.) [50-400]	Bonsal, NC	West.	Pressurized water	915.0	2775.0	87 01	Full-power license, 1-12-87. Commercial operation, 5-2-87.
Shoreham Nuclear Power Station (Long Island Lighting Co.) [50-322]	Brookhaven, NY	GE	Boiling water	820.0	2436.0	85 02	Full-power license, 4-21-89.
South Texas Project, Unit 1 (Houston Lighting & Power Co.) [50-498]	Bay City, TX	West.	Pressurized water	1250.0	3800.0	88 03	Full-power license, 3-22-88. Commercial operation, 8-25-88.

A. Central-Station Electric Power Plants (Continued)

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Power Licensed MW(t)	Initial criticality (yr mo)	Comment
OPERABLE (Continued)							
South Texas Project, Unit 2 (Houston Lighting & Power Co.) [50-499]	Bay City, TX	West.	Pressurized water	1250.0	3800.0	89 02	Full-power license, 3-28-89. Commercial operation, 6-19-89.
St. Lucie Plant, Unit 1 (Florida Power & Light Co.) [50-335]	Fort Pierce, FL	Comb.	Pressurized water	839.0	2700.0	76 04	
St. Lucie Plant, Unit 2 (Florida Power & Light Co.) [50-389]	Fort Pierce, FL	Comb.	Pressurized water	839.0	2700.0	83 06	
Surry Power Station, Unit 1 (Virginia Electric & Power Co.) [50-280]	Gravel Neck, VA	West.	Pressurized water	781.0	2441.0	72 07	
Surry Power Station, Unit 2 (Virginia Electric & Power Co.) [50-281]	Gravel Neck, VA	West.	Pressurized water	781.0	2441.0	73 03	
Susquehanna Steam Electric Station, Unit 1 (Pennsylvania Power & Light Co.) [50-387]	Berwick, PA	GE	Boiling water	1032.0	3293.0	82 09	
Susquehanna Steam Electric Station, Unit 2 (Pennsylvania Power & Light Co.) [50-388]	Berwick, PA	GE	Boiling water	1032.0	3293.0	84 05	
Three Mile Island Nuclear Station, Unit 1 (GPU Nuclear Corp.) [50-289]	Middletown, PA	B&W	Pressurized water	776.0	2568.0	74 06	Shut down 3-28-79 for modifications at the time of the accident at Three Mile Island 2, although not involved in the accident. Three Mile Island 1 resumed commercial operation 11-8-85.
Trojan Nuclear Plant, Unit 1 (Portland General Electric Co.) [50-344]	Prescott, OR	West.	Pressurized water	1075.0	3411.0	75 12	
Turkey Point Plant, Unit 3 (Florida Power & Light Co.) [50-250]	Florida City, FL	West.	Pressurized water	666.0	2200.0	72 10	
Turkey Point Plant, Unit 4 (Florida Power & Light Co.) [50-251]	Florida City, FL	West.	Pressurized water	666.0	2200.0	73 06	
Vermont Yankee Nuclear Power Station (Vermont Yankee Nuclear Power Corp.) [50-271]	Vernon, VT	GE	Boiling water	504.0	1593.0	72 03	
Virgil C. Summer Nuclear Station, Unit 1 (South Carolina Electric & Gas Co.) [50-395]	Jenkinsville, SC	West.	Pressurized water	885.0	2775.0	82 10	
Washington Nuclear Project, Unit 2 (Washington Public Power Supply System) [50-397]	Richland, WA	GE	Boiling water	1095.0	3323.0	84 01	
Waterford Generating Station, Unit 3 (Louisiana Power & Light Co.) [50-382]	Taft, LA	Comb.	Pressurized water	1075.0	3390.0	85 03	Commercial operation, 9-24-85.

William B. McGuire Nuclear Station, Unit 1 (Duke Power Co.) [50-369]	Cowans Ford Dam, NC	West.	Pressurized water	1150.0	3411.0	81 08	
William B. McGuire Nuclear Station, Unit 2 (Duke Power Co.) [50-370]	Cowans Ford Dam, NC	West.	Pressurized water	1150.0	3411.0	83 05	
Wolf Creek Generating Station (Kansas Gas & Electric Co.) [50-482]	Burlington, KS	West.	Pressurized water	1128.0	3411.0	85 05	Commercial operation, 9-3-85.
Yankee Nuclear Power Station (Yankee Atomic Electric Co.) [50-029]	Rowe, MA	West.	Pressurized water	167.0	600.0	60 08	
Zion Nuclear Plant, Unit 1 (Commonwealth Edison Co.) [50-295]	Zion, IL	West.	Pressurized water	1040.0	3250.0	73 06	
Zion Nuclear Plant, Unit 2 (Commonwealth Edison Co.) [50-304]	Zion, IL	West.	Pressurized water	1040.0	3250.0	73 12	

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power Design, electrical power net MW(e)	Power Design, thermal power net MW(t)	Estimated initial criticality (yr mo)	Comment
BEING BUILT							
Bellefonte Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-438]	Scottsboro, AL	B&W	Pressurized water	1235.0	3760.0	Indef.	
Bellefonte Nuclear Plant, Unit 2 (Tennessee Valley Authority) [50-439]	Scottsboro, AL	B&W	Pressurized water	1235.0	3760.0	Indef.	
Comanche Peak Steam Electric Station, Unit 1 (Texas Utilities Generating Co.) [50-445]	Glen Rose, TX	West.	Pressurized water	1150.0	3411.0	90 04	
Comanche Peak Steam Electric Station, Unit 2 (Texas Utilities Generating Co.) [50-446]	Glen Rose, TX	West.	Pressurized water	1150.0	3411.0	Indef.	
Grand Gulf Nuclear Station, Unit 2 (Mississippi Power & Light Co.) [50-417]	Port Gibson, MS	GE	Boiling water	1250.0	3833.0	Indef.	Construction deferred/halted.
Perry Nuclear Power Plant, Unit 2 (Cleveland Electric Illuminating Co.) [50-441]	Perry, OH	GE	Boiling water	1205.0	3759.0	Indef.	Construction deferred/halted.
Washington Nuclear Project, Unit 1 (Washington Public Power Supply System) [50-460]	Richland, WA	B&W	Pressurized water	1266.0	3760.0	Indef.	
Washington Nuclear Project, Unit 3 (Washington Public Power Supply System) [50-508]	Satsop, WA	Comb.	Pressurized water	1242.0	3800.0	Indef.	Utility announced construction delay until funding is assured.
Watts Bar Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-390]	Spring City, TN	West.	Pressurized water	1165.0	3411.0	Indef.	
Watts Bar Nuclear Plant, Unit 2 (Tennessee Valley Authority) [50-391]	Spring City, TN	West.	Pressurized water	1165.0	3411.0	Indef.	

1. POWER REACTORS

B. Dual-Purpose Plants

Name (owner)	Location	Principal nuclear contractor	Type	Power: Capacity net MW(e)	Power: Licensed MW(t)	Initial criticality (yr mo)	Comment
OPERABLE							
N Reactor (DOE)	Richland, WA	WHC	Graphite	860	4000	63 12	N Reactor, a DOE-owned reactor for production of special nuclear materials, also produces steam that is supplied to the adjacent electric generating plant, owned and operated by Washington Public Power Supply System (Supply System). Initial electric-power generation began 4-8-66. Gross power output of 800 MW(e) utilizing N Reactor steam was achieved on 12-9-66, and gross generation of 860 MW(e) was achieved in 1972. Reactor was placed in standby status 2-17-88.

C. Propulsion (Maritime)

(No reactors are currently in this category.)

2. EXPERIMENTAL POWER-REACTOR SYSTEMS

A. Electric-Power Systems

Name (all owned by DOE except as noted)	Designation	Location	Principal nuclear contractor	Type	Power: Capacity net kW(e)	Power: Licensed kW(t)	Initial criticality (yr mo)	Comment
OPERABLE								
Experimental Breeder Reactor II	EBR-II	INEL Site, ID	ANL	Sodium cooled, fast	20,000	62,500	61 00	The EBR-II reactor is a major irradiation facility for the LMR program; it continues to generate electric power and to date (12-89) has produced over 2.2 billion kW-hours for the Idaho National Engineering Laboratory grid. Tests at EBR-II simulating LOF and LOHS accidents demonstrated that the pool-type design, using metallic fuel will safely shut itself down without automatic protection system or operator action. Advanced metal alloy fuel subassemblies have achieved burnups in excess of 180,000 Mwd/T.

B. Space Nuclear Auxiliary Power (SNAP)

Name (all owned by DOE except as noted)	Designation	Location	Principal nuclear contractor	Type	Power: Capacity net kW(e)	Power: Licensed kW(t)	Initial criticality (yr mo)
PLANNED							
SP-100 Ground Engineering System Reactor	SP-100GES	Richland, WA	WHC	Thermo-electric	100	2.5	94 00

C. Space Propulsion

(No reactors are currently in this category.)

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

A. General Irradiation Test

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Authorized power kW(t)	Initial criticality (yr mo)	Comment
OPERABLE							
Advanced Test Reactor (DOE)	ATR	INEL, ID	Ebasco– B&W	Tank	250,000	68 00	Operator: EG&G–ID.
Fast Flux Test Facility (DOE)	FFTF	Richland, WA	WHC	Sodium cooled, loop	400,000	80 02	Operator: WHC.

B. High-Power Research and Test

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Authorized power kW(t)	Initial criticality (yr mo)	Comment
OPERABLE							
Brookhaven High Flux Beam Research Reactor (DOE)	HFBR	Upton, NY	BNL	Heavy water	60,000	65 00	
Brookhaven Medical Research Reactor (DOE)	BMRR	Upton, NY	Daystrom	Tank	5,000	59 00	

B. High-Power Research and Test (Continued)

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Authorized power kW(t)	Initial criticality (yr mo)	Comment
OPERABLE (Continued)							
Cintichem, Inc. Reactor (NRC)	CINR	Sterling Forest, NY	AMF	Pool	5,000	61 00	
High Flux Isotope Reactor (DOE)	HFIR	Oak Ridge, TN	ORNL	Tank flux trap	85,000	65 00	
National Institute of Standards and Technology (NRC)	NIST	Gaithersburg, MD	NBS–B&R	Heavy water	20,000	67 00	
Omega West Reactor (DOE)	OWR	Los Alamos, NM	LANL	Tank	8,000	56 00	

C. Safety-Research and Test

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Authorized power kW(t)	Initial criticality (yr mo)	Comment
OPERABLE							
Power-Burst Facility (DOE)	PBF	INEL, ID	EG&G–ID	Open tank	28,000	73 00	Reactor in standby.
Transient Reactor Test (DOE)	TREAT	INEL Site, ID	ANL	Graphite		59 00	Authorized power, n.a. Transient RX.

D. General Research

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Authorized power kW(t)	Initial criticality (yr mo)	Comment
OPERABLE							
Aerotest Operations, Inc. (NRC)	AGNIR	San Ramon, CA	GA	Pool–TRIGA core	250	65 00	
Annular Core Research Reactor (DOE)	ACRR	Kirtland AFB, East, NM	Sandia	UO_2 BeO	2,000	78 00	Transient.
Biological Research Reactor (DOE)	JANUS	Argonne, IL	ANL	Tank	200	64 00	
Bulk Shielding Reactor (DOE)	BSR	Oak Ridge, TN	ORNL	Pool	2,000	50 00	BSR is light-water-cooled and moderated with a partially BeO-reflected core, which is suspended from a movable bridge and can be positioned to locations within a 12- by 25-foot matrix. The BSR may be operated simultaneously with the non-movable PCA Reactor (zero-power), which is located in the same pool.
Dow Chemical Co. (NRC)	TRIGA-Mk I	Midland, MI	GA	U–Zr hydride	300	67 00	
Fast Source Reactor (DOE)	AFSR	INEL Site, ID	ANL	Fast	1	59 00	
General Atomics, Advanced TRIGA-Mk F Prototype Reactor (NRC)	TRIGA-Mk F	La Jolla, CA	Owner	U–Zr hydride	1,500	60 00	
General Atomics, TRIGA-Mk I Prototype Reactor (NRC)	TRIGA-Mk I	La Jolla, CA	Owner	U–Zr hydride	250	58 00	

General Electric Nuclear Test Reactor (NRC)	NTR	Pleasanton, CA	GE	Light water	100	57 00	
Health Physics Research Reactor (DOE)	HPRR	Oak Ridge, TN	ORNL	Fast burst	10	62 00	The HPRR, installed in the Dosimetry Applications Research Facility, is a small, unmoderated fast reactor that can be operated in the steady-state or pulse mode.
Low Temperature Neutron Irradiation Facility (DOE)	LTNIF	Oak Ridge, TN	ORNL	Pool		86 00	A Low Temperature Neutron Irradiation Facility (LTNIF) has been constructed at the BSR for qualified experiments at no cost to users. The LTNIF, opened 12-86, provides a combination of high-radiation intensities and special environmental and testing conditions that have not been previously available in the U.S. Authorized power is negligible.
Neutron Radiography Facility (DOE)	NRAD	INEL, ID	ANL	Pool–TRIGA core	250	77 00	
Neutron Radiography Facility (DOE)	NRF	Richland, WA	WHC	U–Zr hydride	250	77 00	In standby.
Omaha Veterans Administration Hospital (NRC)	TRIGA-Mk I	Omaha, NE	GA	U–Zr hydride	18	59 00	
Rhode Island Nuclear Science Center (NRC)	RINSC	Narrangansett, RI	RI	Pool	2,000	64 00	
Sandia Pulsed Reactor II (DOE)	SPR-II	Kirtland AFB, East, NM	Sandia	Prompt burst		67 00	Transient.
Sandia Pulsed Reactor III (DOE)	SPR-III	Kirtland AFB, East, NM	Sandia	Prompt burst		75 00	Transient.
Tower Shielding Reactor No. II (DOE)	TSR-2	Oak Ridge, TN	ORNL	Light water	1,000	60 00	TSR-II is a light-water cooled and moderated reactor, utilizing enriched uranium, aluminum-clad fuel plates in a spherical core to provide a spherically symmetrical source of radiation for conducting shielding experiments. It is operated in a cylindrical tank that can be positioned in a ground-based shield or elevated to study the transport of radiation through air. The TSR-II is currently (1986) being used in a shielding program that is jointly sponsored by DOE and a Japanese consortium headed by PNC.
U. S. Geological Survey Laboratory (Department of the Interior) (NRC)	TRIGA-Mk I	Denver, CO	GA	U–Zr hydride	1,000	69 00	
PLANNED							
Advanced Neutron Source Reactor (DOE)	ANS	Oak Ridge, TN	ORNL	D_2O flux trap	325,000		

E. University Research and Teaching

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Authorized power kW(t)	Initial criticality (yr mo)	Comment
OPERABLE							
Arizona, University of (NRC)	TRIGA-Mk I	Tucson, AZ	GA	U–Zr hydride	100	58 00	
California, Irvine, University of (NRC)	TRIGA-Mk I	Irvine, CA	GA	U–Zr hydride	250	69 00	

E. University Research and Teaching

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Authorized power kW(t)	Initial criticality (yr mo)	Comment
OPERABLE (Continued)							
Cornell University (NRC)	TRIGA-Mk II	Ithaca, NY	GA	U–Zr hydride	500	62 00	
Cornell University Zero Power Reactor (NRC)	ZPR	Ithaca, NY	Vitro	Tank		62 00	Authorized power is negligible.
Florida, University of (NRC)	UFTR	Gainesville, FL	GNEC	Graphite/water	100	59 00	
Georgia Institute of Technology (NRC)	GTRR	Atlanta, GA	GNEC	Heavy water	5,000	64 00	
Idaho State University (NRC)	AGN-201P-103	Pocatello, ID	AGN	Homog. solid		67 00	The AGN-201P-103 was operated at San Ramon, CA, by Aerojet-General Corporation from 1957 to 1966. In 4-67 Idaho State University applied for a license to operate the reactor at Pocatello, ID. Authorized power is negligible.
Illinois, University of (NRC)	LOPRA	Urbana, IL	GA	U–Zr hydride	10	71 00	
Illinois, University of (NRC)	TRIGA-Mk II	Champaign–Urbana, IL	GA	U–Zr hydride	1,500	60 00	
Iowa State University (NRC)	UTR-10	Ames, IA	AS Inc.	Graphite/water	10	59 00	
Kansas State University (NRC)	TRIGA-Mk II	Manhattan, KS	GA	U–Zr hydride	250	62 00	
Lowell, University of (NRC)	ULR	Lowell, MA	GE	Pool	1,000	74 00	
Manhattan College (NRC)	MCZPR	New York, NY	AMF	Tank		64 00	Authorized power is negligible.
Maryland, University of (NRC)	TRIGA	College Park, MD	GA	Tank–TRIGA core	250	74 00	
Massachusetts Institute of Technology (NRC)	MITR-II	Cambridge, MA	ACF	Heavy-water reflected	5,000	58 00	
Michigan, University of (Ford Nuclear Reactor) (NRC)	FNR	Ann Arbor, MI	B&W	Pool	2,000	57 00	
Missouri at Rolla, University of (NRC)	UMR-R	Rolla, MO	CW	Pool	200	61 00	
Missouri, University of (NRC)	MURR	Columbia, MO	Owner–IC	Tank	10,000	66 00	
New Mexico, University of (NRC)	AGN-201M-112	Albuquerque, NM	AGN	Homog. solid		66 00	AGN-201-112 was operated at the University of California, Berkeley, beginning in 1957. The University of New Mexico filed an application in 4-66 for transfer and reconstruction of the reactor at a site on its campus. The reactor achieved criticality at the University of New Mexico on 10-7-66. Authorized power is negligible.
North Carolina State University (NRC)	PULSTAR	Raleigh, NC	AMF	Pool	1,000	72 00	
Ohio State University (NRC)	OSURR	Columbus, OH	Lockheed	Pool	10	61 00	
Oregon State University (NRC)	OSTR	Corvallis, OR	GA	U–Zr hydride	1,000	67 00	
Penn State TRIGA Reactor (NRC)	PSTR	University Park, PA	GA	Pool–TRIGA core	1,000	65 00	Owner: Pennsylvania State University. From 1955 to 1965 the Penn State reactor was operated as a 200-kW(t) pool-type reactor fueled with MTR-type elements.

Purdue University (NRC)	PUR-1	West Lafayette, IN	Lockheed	Pool	1	62 00	
Reed College (NRC)	TRIGA-Mk I	Portland, OR	GA	U–Zr hydride	250	68 00	
State University of New York (NRC)	PULSTAR	Buffalo, NY	AMF	Pool	2,000	61 00	Owner: Buffalo Materials Research Center.
Texas A&M University (NRC)	AGN-201M-106	College Station, TX	AGN	Homog. solid		57 00	Authorized power is negligible.
Texas A&M University (NRC)	TRIGA	College Station, TX	GA	U–Zr hydride	1,000	61 00	The Nuclear Science Center Reactor at Texas A&M University has been modified for 1000-kW steady-state operation with a TRIGA-type core. Power level was 100 kW prior to modification in 1968.
Texas at Austin, University of (NRC)	TRIGA-Mk I	Austin, TX	GA	U–Zr hydride	250	63 00	
Texas at Austin, University of (NRC)	TRIGA-Mk II	Austin, TX	GA	U–Zr hydride	1,100	89 00	
Utah, University of (NRC)	AGN-201-107	Salt Lake City, UT	AGN	Homog. solid		57 00	Authorized power is negligible.
Utah, University of (NRC)	TRIGA-Mk I	Salt Lake City, UT	GA	U–Zr hydride	250	75 00	
Virginia, University of (NRC)	CAVALIER	Charlottesville, VA	Owner			74 00	Authorized power is negligible.
Virginia, University of (NRC)	UVAR	Charlottesville, VA	Owner–B&W	Pool	2,000	60 00	
Washington State University (NRC)	WSTR	Pullman, WA	GA	Pool–TRIGA core	1,000	67 00	In 1967 the original MTR-type core of the Washington State University reactor was replaced by a modified TRIGA-type core and control system, and the steady-state power level was increased from 100 to1000 kW(t).
Washington, University of (NRC)	Educator	Seattle, WA	AMF	Graphite/water	100	61 00	
Wisconsin, University of (NRC)	TRIGA	Madison, WI	GA	Pool–TRIGA core	1,000	67 00	The University of Wisconsin reactor has been modified for 1000-kW steady-state operation with a TRIGA-type core. Power level was 250 kW prior to modification in 1967.
Worcester Polytechnic Institute (NRC)		Worcester, MA	GE	Pool	10	59 00	
PLANNED							
Arkansas Tech University (NRC)	TRIGA-Mk I	Russellville, AR	GA	U–Zr hydride	250		

1. MATERIALS PRODUCTION

(All owned by DOE)

Designation	Nuclear designer	Type	Location	Start-up	Comment
OPERABLE					
C Reactor	Du Pont	Heavy water	Aiken, SC	55 00	Cold standby.
K Reactor	Du Pont	Heavy water	Aiken, SC	54 00	In extended outage for maintenance and hardware and software upgrades.
L Reactor	Du Pont	Heavy water	Aiken, SC	54 00	In extended outage for maintenance and hardware and software upgrades.
P Reactor	Du Pont	Heavy water	Aiken, SC	54 00	In extended outage for maintenance and hardware and software upgrades.
PLANNED					
Modular High Temperature Gas Reactor	INEL	Gas cooled	INEL Site, ID	20 00	Four modules of 350 MW(t) each.

2. PROCESS DEVELOPMENT

(No reactors in this category.)

1. DEFENSE POWER-REACTOR APPLICATIONS

A. Remote Installations

(No reactors in this category.)

B. Propulsion (Naval)

The abbreviations used here are defined as follows:
SSN, Submarine (Nuclear Propulsion)
SSBN, Fleet Ballistic Missile Submarine (Nuclear Propulsion)
CGN, Guided Missile Cruiser (Nuclear Propulsion)
CVN, Aircraft Carrier (Nuclear Propulsion)

Name (all owned by U. S. Navy)	Designation	Shipbuilder	Start-up
OPERABLE			
USS PERMIT	SSN594	Mare Island	1962
USS BARB	SSN596	Ingalls	1963
USS HADDO	SSN604	NYSC	1964
USS TINOSA	SSN606	Portsmouth	1963
USS SAM HOUSTON	SSN609	Newport News	1961
USS JOHN MARSHALL	SSN611	Newport News	1962
USS GUARDFISH	SSN612	NYSC	1966
USS FLASHER	SSN613	Electric Boat (Groton)	1966
USS GREENLING	SSN614	GD (Quincy)	1967
USS GATO	SSN615	GD (Quincy)	1967
USS LAFAYETTE	SSBN616	Electric Boat (Groton)	1963
USS ALEXANDER HAMILTON	SSBN617	Electric Boat (Groton)	1963
USS HADDOCK	SSN621	Ingalls	1967
USS JAMES MONROE	SSBN622	Newport News	1963
USS WOODROW WILSON	SSBN624	Mare Island	1963
USS HENRY CLAY	SSBN625	Newport News	1963
USS DANIEL WEBSTER	SSBN626	Electric Boat (Groton)	1964
USS JAMES MADISON	SSBN627	Newport News	1964
USS TECUMSEH	SSBN628	Electric Boat (Groton)	1964
USS DANIEL BOONE	SSBN629	Mare Island	1963
USS JOHN C. CALHOUN	SSBN630	Newport News	1964
USS ULYSSES S. GRANT	SSBN631	Electric Boat (Groton)	1964
USS VON STEUBEN	SSBN632	Newport News	1964
USS CASIMIR PULASKI	SSBN633	Electric Boat (Groton)	1964
USS STONEWALL JACKSON	SSBN634	Mare Island	1964
SAM RAYBURN*	ex-SSBN635	Newport News	1964
USS STURGEON	SSN637	Electric Boat (Groton)	1966
USS WHALE	SSN638	GD (Quincy)	1968
USS TAUTOG	SSN639	Ingalls	1968
USS BENJAMIN FRANKLIN	SSBN640	Electric Boat (Groton)	1965
USS SIMON BOLIVAR	SSBN641	Newport News	1965
USS KAMEHAMEHA	SSBN642	Mare Island	1965

Name (all owned by U. S. Navy)	Designation	Shipbuilder	Start-up
USS NEW YORK CITY	SSN696	Electric Boat (Groton)	1978
USS INDIANAPOLIS	SSN697	Electric Boat (Groton)	1979
USS BREMERTON	SSN698	Electric Boat (Groton)	1979
USS JACKSONVILLE	SSN699	Electric Boat (Groton)	1979
USS DALLAS	SSN700	Electric Boat (Groton)	1980
USS LA JOLLA	SSN701	Electric Boat (Groton)	1981
USS PHOENIX	SSN702	Electric Boat (Groton)	1981
USS BOSTON	SSN703	Electric Boat (Groton)	1981
USS BALTIMORE	SSN704	Electric Boat (Groton)	1982
USS CITY OF CORPUS CHRISTI	SSN705	Electric Boat (Groton)	1982
USS ALBUQUERQUE	SSN706	Electric Boat (Groton)	1982
USS PORTSMOUTH	SSN707	Electric Boat (Groton)	1983
USS MINNEAPOLIS-SAINT PAUL	SSN708	Electric Boat (Groton)	1983
USS HYMAN G. RICKOVER	SSN709	Electric Boat (Groton)	1984
USS AUGUSTA	SSN710	Electric Boat (Groton)	1984
USS SAN FRANCISCO	SSN711	Newport News	1980
USS ATLANTA	SSN712	Newport News	1981
USS HOUSTON	SSN713	Newport News	1982
USS NORFOLK	SSN714	Newport News	1983
USS BUFFALO	SSN715	Newport News	1983
USS SALT LAKE CITY	SSN716	Newport News	1983
USS OLYMPIA	SSN717	Newport News	1984
USS HONOLULU	SSN718	Newport News	1985
USS PROVIDENCE	SSN719	Electric Boat (Groton)	1985
USS PITTSBURGH	SSN720	Electric Boat (Groton)	1985
USS CHICAGO	SSN721	Newport News	1986
USS KEY WEST	SSN722	Newport News	1987
USS OKLAHOMA CITY	SSN723	Newport News	1987
USS LOUISVILLE	SSN724	Electric Boat (Groton)	1986
USS HELENA	SSN725	Electric Boat (Groton)	1987
USS OHIO	SSBN726	Electric Boat (Groton)	1980
USS MICHIGAN	SSBN727	Electric Boat (Groton)	1982

USS GEORGE BANCROFT	SSBN643	Electric Boat (Groton)	1965
USS LEWIS AND CLARK	SSBN644	Newport News	1965
USS JAMES K. POLK	SSBN645	Electric Boat (Groton)	1966
USS GRAYLING	SSN646	Portsmouth	1969
USS POGY	SSN647	NYSC/Ingalls	1970
USS ASPRO	SSN648	Ingalls	1968
USS SUNFISH	SSN649	GD (Quincy)	1968
USS PARGO	SSN650	Electric Boat (Groton)	1967
USS QUEENFISH	SSN651	Newport News	1966
USS PUFFER	SSN652	Ingalls	1969
USS RAY	SSN653	Newport News	1967
USS GEORGE C. MARSHALL	SSBN654	Newport News	1966
USS HENRY L. STIMSON	SSBN655	Electric Boat (Groton)	1966
USS GEORGE WASHINGTON CARVER	SSBN656	Newport News	1966
USS FRANCIS SCOTT KEY	SSBN657	Electric Boat (Groton)	1966
USS MARIANO G. VALLEJO	SSBN658	Mare Island	1966
USS WILL ROGERS	SSBN659	Electric Boat (Groton)	1967
USS SAND LANCE	SSN660	Portsmouth	1971
USS LAPON	SSN661	Newport News	1967
USS GURNARD	SSN662	Mare Island	1968
USS HAMMERHEAD	SSN663	Newport News	1967
USS SEA DEVIL	SSN664	Newport News	1968
USS GUITARRO	SSN665	Mare Island	1972
USS HAWKBILL	SSN666	Mare Island	1970
USS BERGALL	SSN667	Electric Boat (Groton)	1969
USS SPADEFISH	SSN668	Newport News	1969
USS SEA HORSE	SSN669	Electric Boat (Groton)	1969
USS FINBACK	SSN670	Newport News	1969
USS NARWHAL	SSN671	Electric Boat (Groton)	1969
USS PINTADO	SSN672	Mare Island	1970
USS FLYING FISH	SSN673	Electric Boat (Groton)	1969
USS TREPANG	SSN674	Electric Boat (Groton)	1970
USS BLUEFISH	SSN675	Electric Boat (Groton)	1970
USS BILLFISH	SSN676	Electric Boat (Groton)	1970
USS DRUM	SSN677	Mare Island	1971
USS ARCHERFISH	SSN678	Electric Boat (Groton)	1971
USS SILVERSIDES	SSN679	Electric Boat (Groton)	1971
USS WILLIAM H. BATES	SSN680	Ingalls	1972
USS BATFISH	SSN681	Electric Boat (Groton)	1972
USS TUNNY	SSN682	Ingalls	1973
USS PARCHE	SSN683	Ingalls	1974
USS CAVALLA	SSN684	Electric Boat (Groton)	1972
USS GLENARD P. LIPSCOMB	SSN685	Electric Boat (Groton)	1974
USS L. MENDELL RIVERS	SSN686	Newport News	1974
USS RICHARD B. RUSSELL	SSN687	Newport News	1974
USS LOS ANGELES	SSN688	Newport News	1976
USS BATON ROUGE	SSN689	Newport News	1977
USS PHILADELPHIA	SSN690	Electric Boat (Groton)	1976
USS MEMPHIS	SSN691	Newport News	1977
USS OMAHA	SSN692	Electric Boat (Groton)	1977
USS CINCINNATI	SSN693	Newport News	1977
USS GROTON	SSN694	Electric Boat (Groton)	1977
USS BIRMINGHAM	SSN695	Newport News	1978
USS FLORIDA	SSBN728	Electric Boat (Groton)	1982
USS GEORGIA	SSBN729	Electric Boat (Groton)	1983
USS HENRY M. JACKSON	SSBN730	Electric Boat (Groton)	1984
USS ALABAMA	SSBN731	Electric Boat (Groton)	1984
USS ALASKA	SSBN732	Electric Boat (Groton)	1985
USS NEVADA	SSBN733	Electric Boat (Groton)	1986
USS TENNESSEE	SSBN734	Electric Boat (Groton)	1987
USS PENNSYLVANIA	SSBN735	Electric Boat (Groton)	1988
USS NEWPORT NEWS	SSN750	Newport News	1988
USS SAN JUAN	SSN751	Electric Boat (Groton)	1987
USS PASADENA	SSN752	Electric Boat (Groton)	1988
USS ALBANY	SSN753	Newport News	1989
USS TOPEKA	SSN754	Electric Boat (Groton)	1989
USS MIAMI	SSN755	Electric Boat (Groton)	1989
USS LONG BEACH (2 reactors)	CGN9	Bethlehem	1961
USS BAINBRIDGE (2 reactors)	CGN25	Bethlehem	1962
USS TRUXTUN (2 reactors)	CGN35	NYSC	1967
USS CALIFORNIA (2 reactors)	CGN36	Newport News	1973
USS SOUTH CAROLINA (2 reactors)	CGN37	Newport News	1974
USS VIRGINIA (2 reactors)	CGN38	Newport News	1976
USS TEXAS (2 reactors)	CGN39	Newport News	1977
USS MISSISSIPPI (2 reactors)	CGN40	Newport News	1978
USS ARKANSAS (2 reactors)	CGN41	Newport News	1980
USS ENTERPRISE (8 reactors)	CVN65	Newport News	1960
USS NIMITZ (2 reactors)	CVN68	Newport News	1974
USS DWIGHT D. EISENHOWER (2 reactors)	CVN69	Newport News	1977
USS CARL VINSON (2 reactors)	CVN70	Newport News	1981
USS THEODORE ROOSEVELT (2 reactors)	CVN71	Newport News	1986
USS ABRAHAM LINCOLN (2 reactors)	CVN72	Newport News	1989
Deep Submergence Research Vehicle	NR-1	Electric Boat (Groton)	1969

BEING BUILT

WEST VIRGINIA	SSBN736	Electric Boat (Groton)
KENTUCKY	SSBN737	Electric Boat (Groton)
MARYLAND	SSBN738	Electric Boat (Groton)
NEBRASKA	SSBN739	Electric Boat (Groton)
Submarine	SSBN740	Electric Boat (Groton)
Submarine	SSBN741	Electric Boat (Groton)
Submarine	SSBN742	Electric Boat (Groton)
SCRANTON	SSN756	Newport News
ALEXANDRIA	SSN757	Electric Boat (Groton)
ASHEVILLE	SSN758	Newport News
JEFFERSON CITY	SSN759	Newport News
ANNAPOLIS	SSN760	Electric Boat (Groton)
SPRINGFIELD	SSN761	Electric Boat (Groton)
COLUMBUS	SSN762	Electric Boat (Groton)
SANTA FE	SSN763	Electric Boat (Groton)
BOISE	SSN764	Newport News
MONTPELIER	SSN765	Newport News

B. Propulsion (Naval) (Continued)

Name (all owned by U. S. Navy)	Designation	Shipbuilder	Start-up
BEING BUILT (Continued)			
CHARLOTTE	SSN766	Newport News	
HAMPTON	SSN767	Newport News	
HARTFORD	SSN768	Electric Boat (Groton)	
TOLEDO	SSN769	Newport News	
TUCSON	SSN770	Newport News	
COLOMBIA	SSN771	Electric Boat (Groton)	
Submarine	SSN772	Newport News	
Submarine	SSN773	Newport News	
SEAWOLF	SSN21	Electric Boat (Groton)	
GEORGE WASHINGTON	CVN73	Newport News	
JOHN C. STENNIS	CVN74	Newport News	
UNITED STATES	CVN75	Newport News	

*Removed from sea-going service and converted to training platform.

2. DEVELOPMENTAL POWER

A. Electric-Power Experiments and Prototypes

(No reactors in this category.)

B. Propulsion Experiments and Prototypes

Name (all owned by DOE)	Designation	Location	Principal nuclear contractor	Type	Initial criticality (yr mo)
OPERABLE					
Destroyer Reactor Prototype	D1G	West Milton, NY	GE	Pressurized water	62 00
Large Ship Reactor Prototype (2 reactors)	A1W	INEL Site, ID	West.	Pressurized water	58 00
Modifications and Additions to Reactor Facility	MARF	West Milton, NY	GE	Pressurized water	76 00
Natural Circulation Test Plant	S5G	INEL Site, ID	West.	Pressurized water	65 00
Small Submarine Reactor Prototype	S1C	Windsor, CT	GE	Pressurized water	59 00
Submarine Advanced Reactor Prototype	S3G	West Milton, NY	GE	Pressurized water	58 00
Trident Prototype	S8G	West Milton, NY	GE	Pressurized water	78 00

3. TEST AND RESEARCH

A. Test

(No reactors in this category.)

B. Research

Name	Designation	Location	Principal nuclear contractor	Type	Authorized, kW(t)	Initial criticality (yr mo)
OPERABLE						
Aberdeen Pulsed Reactor Facility (Test and Evaluation Command, USA)	APRF	Aberdeen, MD	UNC	Bare, fast, prompt burst	10	68 00
Armed Forces Radiobiology Research Institute (DNA, DOD)	AFRRI	Bethesda, MD	GA	TRIGA-Mk F	1000	62 00
Fast Burst Reactor Facility (Test and Evaluation Command, USA)	FBRF	White Sands, NM	Kaman	Bare, fast, prompt burst	10	64 00
BEING BUILT						
Stationary Neutron Radiography System	TRIGA	McClellan AFB, CA	GA	U–Zr hydride	1300	90 01

1. POWER REACTORS

PART IV EXPORT REACTORS

A. Central-Station Electric Power Plants

Reactor name. Owner	Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Author-ized power kW(t)	Initial criti-cality (yr mo)	Comment
OPERABLE								
Belgium, Doel, Unit 1.	Antwerp		West. Pressurized water	392.0	1192.0	0.0	75 00	
Belgium, Doel, Unit 2.	Antwerp		West. Pressurized water	392.0	1192.0	0.0	75 00	
Belgium, Doel, Unit 4.	Antwerp		West. Pressurized water	1006.0	3000.0	0.0	85 00	
Belgium, Tihange, Unit 1.	Huy, Liege		West./Fram, ACEC. Pressurized water	870.0	2660.0	0.0	75 00	
Belgium, Tihange, Unit 3.	Huy, Liege		West. Pressurized water	1006.0	3000.0	0.0	85 00	
Brazil, Angra 1, Central Electricia de Furnas.	Angra dos Reis	XR-081 04/13/73	West. Pressurized water	626.0	1882.0	0.0	85 00	
France. Franco-Belgian Society for Nuclear Energy of Ardennes, SENA	Chooz		West./Fram, ACEC. Pressurized water	305.0	1040.0	0.0	67 00	
Germany, Mulheim-Kaerlich. Rheinesch-Westfaelisches Elektrizitaetswerk AG	Mulheim-Kaerlich	XR-118 06/28/77	Pressurized water	1200.0	0.0	0.0	87 10	
India, Tarapur Nuclear Power Station, Unit 1.	Tarapur (near Bombay)	XR-054 07/07/64	GE. Boiling water	200.0	707.0	0.0	69 00	
India, Tarapur Nuclear Power Station, Unit 2.	Tarapur (near Bombay)	XR-054 07/07/64	GE. Boiling water	200.0	707.0	0.0	69 00	
Italy, Caorso Nuclear Station. ENEL	Piacenza/ Cremona	XR-077 04/02/71	GE. Boiling water	840.0	2651.0	0.0	79 00	Shut down and monitored since 1-87.
Italy, Trino Vercellese. ENEL	Trino, Piedmont	XR-044 06/14/62	West. Pressurized water	247.0	870.0	0.0	65 00	Shut down and monitored since 1-87.

A. Central-Station Electric Power Plants (Continued)

Reactor name. Owner	Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Author-ized power kW(t)	Initial criti-cality (yr mo)	Comment
OPERABLE (Continued)								
Japan, Fukushima Dai-ichi Power Station, Unit 1. Tokyo Electric Power Co.	Okuma, Fukushima Pref.	XR-066 08/15/67	GE. Boiling water	439.0	1380.0	0.0	71 00	
Japan, Fukushima Dai-ichi Power Station, Unit 2. Tokyo Electric Power Co.	Okuma, Fukushima Pref.	XR-072 04/22/70	GE, Toshiba. Boiling water	760.0	2381.0	0.0	74 00	
Japan, Fukushima Dai-ichi Power Station, Unit 6. Tokyo Electric Power Co.	Futaba, Fukushima Pref.	XR-084 05/25/73	GE, Toshiba. Boiling water	1067.0	3293.0	0.0	79 00	
Japan, Genkai, Unit 1. Kyushu Electric Power Co.	Genkai	XR-092 07/17/73	Mitsubishi. Pressurized water	529.0	0.0	0.0	75 10	
Japan, Ikata, Unit 1. Mitsubishi.	Ikata	XR-093 11/12/73	Pressurized water	538.0	0.0	0.0		
Japan, Mihama Power Station, Unit 1. Kansai Electric Power Co.	Mihama, Fukui Pref.	XR-067 08/15/67	West., Mitsubishi. Pressurized water	320.0	1031.0	0.0	70 00	
Japan, Mihama, Unit 2. Kansai Electric Power Co.	Mihama, Fukui Pref.	XR-071 02/04/70	Mitsubishi. Pressurized water	470.0	0.0	0.0	72 07	
Japan, Mihama, Unit 3. Kansai Electric Power Co.	Mihama, Fukui Pref.	XR-086 06/10/74	Mitsubishi. Pressurized water	780.0	0.0	0.0	76 12	
Japan, Ohi Power Station, Unit 1. Kansai Electric Power Co.	Ohi, Fukui Pref.	XR-082 04/17/73	West., Mitsubishi. Pressurized water	1120.0	3423.0	0.0	79 00	
Japan, Ohi Power Station, Unit 2. Kansai Electric Power Co.	Ohi, Fukui Pref.	XR-082 04/17/73	West., Mitsubishi. Pressurized water	1120.0	3423.0	0.0	79 00	
Japan, Takahama Power Station, Unit 1. Kansai Electric Power Co.	Takahama, Fukui Pref.	XR-079 07/23/71	West., Mitsubishi. Pressurized water	780.0	2440.0	0.0	74 00	
Japan, Takahama Power Station, Unit 2. Kansai Electric Power Co.	Takahama, Fukui Pref.	XR-087 07/25/73	Mitsubishi. Pressurized water	780.0	0.0	0.0	75 11	
Japan, Tokai No. 2 Power Station. Japan Atomic Power Co.	Tokai-Mura, Ibaraki Pref.	XR-085 05/25/73	GE, Hitachi, Shimizu. Boiling water	1080.0	3293.0	0.0	78 00	
Japan, Tsuruga Power Station. Japan Atomic Power Co.	Tsuruga, Fukui Pref.	XR-065 06/22/67	GE. Boiling water	341.0	1064.0	0.0	70 00	
Korea, Kori-1. Korea Electric Power Co.	Kori (near Pusan)	XR-083 05/04/73	West. Pressurized water	564.0	1729.0	0.0	78 00	Formerly, Korea, Unit 1
Korea, Kori-2. Korea Electric Power Co.	Kori (near Pusan)	XR-119 04/08/77	West. Pressurized water	605.0	1876.0	0.0	83 00	Formerly, Korea, Unit 2
Korea, Kori-3. Korea Electric Power Co.	Kori (near Pusan)	XR-131 10/04/78	West. Pressurized water	900.0	2775.0	0.0	85 00	Formerly, Korea, Unit 5
Korea, Kori-4. Korea Electric Power Co.	Kori (near Pusan)	XR-131 10/04/78	West. Pressurized water	900.0	2775.0	0.0	85 00	Formerly, Korea, Unit 6
Korea, Yonggwang-1. Korea Electric Power Co.	Gyema (near Kwang Ju)	XR-133 09/22/80	West. Pressurized water	900.0	2775.0	0.0	86 00	Formerly, Korea, Unit 7
Korea, Yonggwang-2. Korea Electric Power Co.	Gyema (near Kwang Ju)	XR-133 09/22/80	West. Pressurized water	900.0	2775.0	0.0	87 00	Formerly, Korea, Unit 8
Mexico, Laguna Verde Station, Unit 1.	Laguna Verde	XR-098 05/17/74	GE. Boiling water	654.0	1931.0	0.0	88 11	In startup. Planned commercial operation: mid 1990.

Netherlands, Dodewaard. GKN	Dodewaard, Betuwe	XR-058 09/15/65	GE. Boiling water	55.0	183.0	0.0	68 06	In 1984 the reactor's nominal power was raised from 163.4 MW(t) to 183 MW(t). The reactor's cooling is by natural circulation only.
Spain, Almaraz, Unit 1. Union Electrica, S.A.	Almaraz	XR-088 07/12/73	West. Pressurized water	902.0	2696.0	0.0	81 00	
Spain, Almaraz, Unit 2. Union Electrica, S.A.	Almaraz	XR-088 07/12/73	West. Pressurized water	902.0	2696.0	0.0	83 00	
Spain, Asco, Unit 1. FECSA	Asco	XR-090 07/12/73	West. Pressurized water	902.0	2696.0	0.0	83 00	
Spain, Asco, Unit 2. FECSA	Asco	XR-099 06/22/76	West. Pressurized water	902.0	2696.0	0.0	85 00	
Spain, Cofrentes, Unit 1. Hidroelectrica Espanola S.A.	Cofrentes	XR-097 06/10/74	GE. Boiling water	975.0	2900.0	0.0	84 00	
Spain, José Cabrera. Union Electrica, S.A.	Zorita de los Canes	XR-059 10/22/65	West. Pressurized water	160.0	510.0	0.0	69 00	
Spain, Santa Maria de Garoña. Centrales Nucleares del Norte, S.A., Nuclenor	S.M. Garoña Burgos	XR-064 06/09/67	GE. Boiling water	440.0	1381.0	0.0	70 00	
Spain, Vandellos, Unit 2. ENHER	Tarragona	XR-122 9-13-87	West. Pressurized water	920.0	2785.0	0.0	88 03	
Sweden, Ringhals, Unit 2. Swedish State Power Board	Värö (near Göteborg)	XR-069 05/09/69	West. Pressurized water	822.0	2432.0	0.0	74 10	
Sweden, Ringhals, Unit 3. Swedish State Power Board	Värö (near Göteborg)	XR-095 02/02/74	West. Pressurized water	900.0	2783.0	0.0	81 00	
Sweden, Ringhals, Unit 4. Swedish State Power Board	Värö (near Göteborg)	XR-103 10/21/75	West. Pressurized water	900.0	2783.0	0.0	83 00	
Switzerland, Beznau, Unit 1. Nordostschweizerische Kraftwerke AG	Döttingen	XR-063 02/03/67	West. Pressurized water	350.0	1130.0	0.0	69 00	
Switzerland, Beznau, Unit 2. Nordostschweizerische Kraftwerke AG	Döttingen	XR-070 11/05/69	West. Pressurized water	350.0	1130.0	0.0	72 00	
Switzerland, Leibstadt. Kernkraftwerk Leibstadt	Leibstadt	XR-104 12/31/75	GE. Boiling water	942.0	3012.0	0.0	84 00	
Switzerland, Mühleberg. Bernische Kraftwerke AG	Mühleberg (near Bern)	XR-068 10/04/67	GE. Boiling water	320.0	997.0	0.0	71 00	
Taiwan, Chinshan, Unit 1. Taiwan Power Co.	Shihmen	XR-080 07/24/72	GE. Boiling water	604.0	1775.0	0.0	78 00	
Taiwan, Chinshan, Unit 2. Taiwan Power Co.	Shihmen	XR-080 07/24/72	GE. Boiling water	604.0	1775.0	0.0	79 00	
Taiwan, Kuo Sheng, Unit 1. Taiwan Power Co.	Wanli Hsiang	XR-096 04/17/74	GE. Boiling water	948.0	2894.0	0.0	81 00	
Taiwan, Kuo Sheng, Unit 2. Taiwan Power Co.	Wanli Hsiang	XR-096 04/17/74	GE. Boiling water	948.0	2894.0	0.0	82 00	
Taiwan, Maanshan, Unit 1. Taiwan Power Co.	Heng-chun	XR-113 06/08/79	West. Pressurized water	890.0	2785.0	0.0	84 00	
Taiwan, Maanshan, Unit 2. Taiwan Power Co.	Heng-chun	XR-113 06/08/79	West. Pressurized water	890.0	2785.0	0.0	85 00	
Yugoslavia, Krsko. Nuklearna Elektrarna Krsko	Krsko	XR-17 05/20/77	West. Pressurized water	615.0	1882.0	0.0	83 00	
BEING BUILT								
England, Sizewell B. Central Electricity Generating Board	Suffolk	XR-148 07/30/86	West. Pressurized water	1150.0	3425.0	0.0	94 00	

A. Central-Station Electric Power Plants (Continued)

Reactor name. Owner	Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Author-ized power kW(t)	Initial criti-cality (yr mo)	Comment
BEING BUILT (Continued)								
Korea, Yonggwang-3. Korea Electric Power Co.	Gyema (near Kwang Ju)	XR-150 04/16/87	Comb. Pressurized water	900.0	0.0	0.0	95 00	Formerly, Korea, Unit 11.
Korea, Yonggwang-4. Korea Electric Power Co.	Gyema (near Kwang Ju)	XR-150 04/16/87	Comb. Pressurized water	900.0	0.0	0.0	96 00	Formerly, Korea, Unit 12.
Mexico, Laguna Verde Station, Unit 2.	Laguna Verde	XR-102 10/24/74	GE. Boiling water	654.0	1931.0	0.0	93 00	
Philippines, Republic of the Philippine Nuclear Power Plant, Unit 1	Morong, Bataan prov., Luzon	XR-120 05/06/80	West. Pressurized water	620.0	1876.0	0.0		
Spain, Lemoniz, Unit 1	Lemoniz	XR-089 07/12/73	West. Pressurized water	900.0	2696.0	0.0	Indef.	97% complete.
Spain, Lemoniz, Unit 2	Lemoniz	XR-089 07/12/73	West. Pressurized water	900.0	2696.0	0.0	Indef.	57% complete.
Spain, Valdecaballeros, Unit 1. HE: Sevillana de Electricidad	Valdecaballeros, Badajos	XR-110 05/05/77	GE. Boiling water	975.0	2894.0	0.0	95 01	
Spain, Valdecaballeros, Unit 2 HE: Sevillana de Electricidad	Valdecaballeros, Badajos	XR-110 05/05/77	GE. Boiling water	975.0	2894.0	0.0	97 01	
PLANNED								
Egypt, El Dabaa, Unit 1. Nuclear Power Plants Authority	El Dabaa (near Alexandria)		Pressurized water	950.0	1300.0	0.0		NRC export license numbers: XR-144 and XR-145. No date is available because of pending action.
Japan, Kashiwazaki-Kariwa, Unit 6. Tokyo Electric Power Co.	Kashiwazaki		GE. Advanced boiling water	1356.0	0.0	0.0	96 00	
Japan, Kashiwazaki-Kariwa, Unit 7. Tokyo Electric Power Co.	Kashiwazaki		GE. Advanced boiling water	1356.0	0.0	0.0	98 00	
Switzerland, Graben. Bernische Kraftwerke AG	Graben		Boiling water	1140.0	3579.0	0.0		
Taiwan, Unit 7. Taiwan Power Co.	Yenliao	02/17/81		1000.0	0.0	0.0	98 00	The NRC has issued three licenses to vendors for this reactor: XR-134, -135, and -136. However, only the vendor who wins the contract will be allowed to use its license.
Taiwan, Unit 8. Taiwan Power Co.	Yenliao	02/17/81		1000.0	0.0	0.0	99 00	The NRC has issued three licenses to vendors for this reactor: XR-134, -135, and -136. However, only the vendor who wins the contract will be allowed to use its license.

B. Propulsion

(No reactors in this category)

2. TEST, RESEARCH, AND TEACHING

A. General Irradiation Test

Reactor name. Owner	Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Author-ized power kW(t)	Initial criti-cality (yr mo)	Comment
OPERABLE								
Japan. Japan Atomic Energy Research Institute	Tokai-Mura, Ibaraki Pref.	XR-101 10/16/74	GA. TRIGA-ACPR	0.0	0.0	300.0	75 00	
Japan, JRR-2. Japan Atomic Energy Research Institute	Tokai-Mura, Ibaraki Pref.	XR-015 10/11/57	AMF. Heavy water, CP-5	0.0	0.0	10,000.0	60 00	
Netherlands. Energy Center	Petten	XR-017 01/17/58	AC. Tank (MTR)	0.0	0.0	45,000.0	61 09	In 1985 the reactor vessel was replaced. It is now refurbished. Manufacturer of the vessel: Royal Schelde of Flushing (Vlissingen, Holland).
Romania. Institute for Nuclear Technologies	Bucharest	XR-091 06/29/73	GA. TRIGA-ACPR	0.0	0.0	500.0	79 00	
Romania. Institute for Nuclear Technologies	Bucharest	XR-091 06/29/73	GA. TRIGA (MPR 16)	0.0	0.0	14,000.0	79 00	
South Africa, Safari-1. Atomic Energy Board	Pelindaba (near Pretoria)	XR-042 06/14/61	AC. Tank	0.0	0.0	20,000.0	65 00	
Sweden. Studsvik Energiteknik	Studsvik	XR-019 05/14/58	AC. Tank (MTR)	0.0	0.0	50,000.0	60 00	

B. General Research

OPERABLE								
Australia, Moata. Atomic Energy Commission	Lucas Heights, New South Wales	XR-039 09/12/60	AR. UTR-10	0.0	0.0	15.0	61 00	
Austria, Astra. Seibersdorf Research Center	Seibersdorf	XR-023 09/03/58	AMF. Pool	0.0	0.0	5,000.0	60 00	
Bangladesh. Institute of Nuclear Technology	Dhaka	XR-126 10/05/82	GA. TRIGA-Mk II	0.0	0.0	3,000.0	86 00	
Colombia, IAN-R1. Institute of Nuclear Affairs	Bogotá	XR-053 05/27/64	Lockheed. Pool	0.0	0.0	20.0	65 00	
Denmark, DR-1. Risö National Laboratory	Risö	XR-005 04/04/57	AI. L-55	0.0	0.0	2.0	57 00	
England. Imperial Chemical Industries	Billingham, Teesside	XR-074 03/23/71	GA. TRIGA-Mk I	0.0	0.0	250.0	71 00	
Greece, Democritos. Atomic Energy Commission	Athens	XR-014 09/25/57	AMF. Pool	0.0	0.0	1,000.0	61 00	Visited by NRC/DOE team in 1988.
Indonesia. National Atomic Energy Agency	Bandung	XR-048	GA. TRIGA-Mk II	0.0	0.0	1,000.0	64 00	Additional NRC export license No. and date: XR-078, 5/20/71.

B. General Research

Reactor name. Owner	Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Author-ized power kW(t)	Initial criti-cality (yr mo)	Comment
OPERABLE (Continued)								
Indonesia. National Atomic Energy Agency	Yogyakarta		GA. TRIGA-Mk II	0.0	0.0	250.0	79 00	This reactor was designed and built by BATAN (National Atomic Energy Agency of Indonesia). The design was based on the design of TRIGA Mark II reactor, with maximum power level of 250 kW. In 1979 this reactor reached initial criticality at 50 kW. After the upgrading and the replacing of some components, it reached a power level of 100 kW in 1984.
Israel, Soreg. Atomic Energy Commission	Nahal Soreq	XR-021 06/12/58	AMF. Pool	0.0	0.0	5,000.0	60 00	
Italy. National Committee for Nuclear and Alternative Energies	Rome	XR-026 01/08/59	GA. TRIGA-Mk II	0.0	0.0	1,000.0	60 00	
Jamaica. Kingston	Kingston	XR-094 06/03/75	Research reactor	0.0	0.0	0.0		Design power: 10W.
Korea. Advanced Energy Research Institute	Seoul	XR-027 05/21/59	GA. TRIGA-Mk II	0.0	0.0	250.0	62 00	
Korea. Advanced Energy Research Institute	Seoul	XR-073 05/15/70	GA. TRIGA-Mk III	0.0	0.0	2,000.0	72 00	
Malaysia. Tun Ismail Atomic Research Centre	Kuala Lumpur	XR-125 02/20/81	GA. TRIGA-Mk II	0.0	0.0	1,000.0	82 00	
Mexico. National Commission for Nuclear Energy	Salazar	XR-057 02/12/65	GA. TRIGA-Mk III	0.0	0.0	1,000.0	68 00	
Pakistan, PARR. Atomic Energy Commission	Islamabad	XR-046 04/23/62	AMF. Pool	0.0	0.0	5,000.0	65 00	
Philippines, Republic of the, PRR-1. Philippine Atomic Energy Commission	Quezon City	XR-034 11/16/59	GA. TRIGA Conversion	0.0	0.0	3,000.0	88 03	The original Philippine Research Reactor (PRR-1) was designed and built by GE and was commissioned as a 1 MW reactor in 1963. The reactor was shut down 1-85 for extensive upgrading and has now become a TRIGA Conversion. It has a power level of 3 MW and reached criticality on 3-11-88.
Portugal, RP-1. National Laboratory of Engineering and Industrial Technology	Sacavém	XR-013 09/13/57	AMF. Pool	0.0	0.0	1,000.0	61 00	Visited by NRC/DOE team in 1988.
Spain. Nuclear Energy Board-JEN	Madrid	XR-010 07/29/57	GE. Pool	0.0	0.0	3,000.0	58 00	
Switzerland. Paul Scheerer Institute	Wuerenlingen		ORNL. Pool Conversion	0.0	0.0	10,000.0	57 00	This is the 1955 Geneva conference reactor rebuilt with increased power.
Thailand, TRR-1. Office of Atomic Energy for Peace	Bangkok	XR-112 05/05/77	GA. TRIGA-Mk III	0.0	0.0	2,000.0	77 11	The Thai research reactor, TRR-1, built by Curtiss-Wright and started up in 1962,

								originally operated at 1000 kW(t). In 6-75 the TRR-1 was shut down for conversion to TRR-1/M1, a TRIGA-Mark III system adapted for pool installation. The TRR-1/M1, with a power level of 2000 kW(t)/2000 MW pulsing was commissioned 11-77.
Turkey. Atomic Energy Commission	Istanbul	XR-030 09/04/59	AMF. Pool	0.0	0.0	1,000.0	62 00	
Turkey. Technical University of Istanbul	Istanbul	XR-108 03/24/76	GA. TRIGA-Mk II	0.0	0.0	250.0	79 00	
Venezuela. Institute for Scientific Research	Caracas	XR-018 01/16/58	GE. Pool	0.0	0.0	3,000.0	60 00	
Yugoslavia. Josef Stefan Nuclear Institute	Ljubljana	XR-055 01/30/64	GA. TRIGA-Mk II	0.0	0.0	500.0	66 00	
Zaire. Regional Center for Nuclear Studies	Kinshasa		GA.	0.0	0.0	1,000.0	59 00	This TRIGA reactor was operated at the 1958 International Conference in Geneva prior to shipment to the University of Lovanium in 6-59. It is the first reactor to be operated on the African continent.
BEING BUILT								
Morocco. Mohammed V University	Rabat	XR-132 11/27/81	GA. TRIGA-Mk I	0.0	0.0	100.0		

C. University Research and Teaching

Reactor name. Owner	Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Author-ized power kW(t)	Initial criti-cality (yr mo)	Comment
OPERABLE								
Austria. Vienna Polytechnic Institute	Vienna	XR-035 11/24/59	GA. TRIGA-Mk II	0.0	0.0	250.0	62 00	
Brazil. University of Minas Gerais	Belo Horizonte	XR-028 08/03/59	GA. TRIGA-Mk I	0.0	0.0	100.0	60 00	
Brazil. University of São Paulo	São Paulo	XR-002 01/22/57	B&W. Pool	0.0	0.0	5000.0	57 00	
Canada. McMaster University	Hamilton, Ontario	XR-011 08/27/57	AMF. Pool	0.0	0.0	5000.0	59 00	
China, Republic of. National Tsing-Hua University	Hsinchu	XR-020 06/05/58	GE. Pool	0.0	0.0	1000.0	62 00	
Finland, Institute of Technology	Helsinki	XR-040 04/05/61	GA. TRIGA-Mk II	0.0	0.0	250.0	62 00	
Germany. Institute for Nuclear Medicine	Heidelberg	XR-060 02/14/66	GA. TRIGA-Mk I	0.0	0.0	250.0	66 00	This TRIGA-Mk I reactor was installed in 1966. In 1977, the reactor was shut down, dismantled, and moved to another building. After the move, it was started up again in 1978. This operation was referred to as "TRIGA I" and "TRIGA II."
Germany. Johannes Gutenberg University of Mainz	Mainz	XR-050 04/11/64	GA. TRIGA-Mk II	0.0	0.0	100.0	65 00	

C. University Research and Teaching (Continued)

Reactor name. Owner	Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Author-ized power kW(t)	Initial criti-cality (yr mo)	Comment
OPERABLE (Continued)								
Germany. Medical College of Hanover	Hanover	XR-076 02/26/71	GA. TRIGA-Mk I	0.0	0.0	250.0	73 00	
Germany. FRM Gersching. Technical University of Munich	Munich	XR-004 03/15/57	AMF. Pool	0.0	0.0	4000.0	57 00	
Iran. University of Tehran	Tehran	XR-029 08/05/59	AMF. Pool	0.0	0.0	5000.0	67 00	Fuel supplier being sought.
Italy. University of Palermo	Palermo	XR-025 01/07/59	AGN. 201-110	0.0	0.0	0.0	60 00	Negligible power. Shut down for renewal of operating license.
Italy. University of Pavia	Pavia	XR-056 03/12/65	GA. TRIGA-Mk II	0.0	0.0	250.0	65 00	Shut down for renewal of operating license.
Japan. Kinki University	Higashi-Osaka	XR-041 04/18/61	AR. UTR-10	0.0	0.0	0.0	61 00	Negligible power.
Japan. Musashi College of Technology	Kawasaki	XR-037 07/08/60	GA. TRIGA-Mk II	0.0	0.0	100.0	63 00	
Japan. Rikkyo University	Yokosuka	XR-038 07/08/60	GA. TRIGA-Mk II	0.0	0.0	100.0	61 00	
Korea. University of Kyung Hee	Seoul	XR-105 11/18/75	AGN. 201			0.0	82 00	Negligible power.
Netherlands. Delft Technical University	Delft	XR-003 02/01/57	AMF. Pool (MTR)	0.0	0.0	2000.0	63 04	The Netherlands research reactor was originally operated at the Amsterdam International Exhibition in 6-57; major portions of the exhibition reactor system were used to fabricate the present reactor.
Switzerland. University of Basel	Basel		AGN. 211-100	0.0	0.0	0.0	58 00	This reactor was operated in the Inter-national Science Section of the Brussels Informa-tion Exhibition, 4-15-58 to 10-1-58, prior to transfer to the University of Basel. Negligible power.

Facility	Designation	Location	Equipment: No. of cells	Equipment: No. of control panels/ room	Abbreviation	Initial criticality (yr mo)	Subject of experiment or study. Comment
OPERABLE							
Advanced Reactivity Measurement Facility (DOE)	ARMF-I	INEL Site, ID	1	1	ARMF-I	60 00	Reactor-physics constants and reactivity changes caused by test-reactor irradiation.

Advanced Test Reactor Critical Facility (DOE)	ATRC	INEL Site, ID	1	1	ATRC	64 00	ATR physics, core-loading and core-design measurements.
Argonne National Laboratory, Idaho Division (DOE)	ZPPR	INEL Site, ID	1	1	ANL-IDAHO	69 00	Basic fast reactor studies and mock-up for LMFBR.
Coupled Fast Reactor Measurement Facility (DOE)	CFRMF	INEL Site, ID	1	1	CFRMF	68 00	Studies of differential cross sections to test calculational methods. Irradiation facility.
Los Alamos National Laboratory (DOE)	Big Ten	Los Alamos, NM	0	0	LANL, Kiva II	72 00	U(10)-metal cylinder in thick metal reflector.
Los Alamos National Laboratory (DOE)	Comet	Los Alamos, NM	0	0	LANL, Kiva II	52 00	Critical-configuration safety and neutronic tests.
Los Alamos National Laboratory (DOE)	Flattop	Los Alamos, NM	1	1	LANL, Kiva II	57 00	Spherical metal cores in thick metal reflector.
Los Alamos National Laboratory (DOE)	Godiva-IV	Los Alamos, NM	0	0	LANL, Kiva III	67 00	Fast neutron irradiation, pulse capability.
Los Alamos National Laboratory (DOE)	Honeycomb	Los Alamos, NM	0	0	LANL, Kiva I	56 00	Flexible split table assembly.
Los Alamos National Laboratory (DOE)	Mars	Los Alamos, NM	0	0	LANL, Kiva I	74 00	Vertical table assembly machine.
Los Alamos National Laboratory (DOE)	Planet	Los Alamos, NM	0	0	LANL, Kiva II	84 00	Vertical table assembly.
Los Alamos National Laboratory (DOE)	SHEBA	Los Alamos, NM	2	1	LANL, Kiva I	80 00	Solution high energy burst assembly.
Los Alamos National Laboratory (DOE)	SKUA	Los Alamos, NM	1	1	LANL, Kiva III	78 00	Fast neutron irradiation, pulse capability.
ORNL Pool Critical Assembly BSF Pool (DOE)	PCA	Oak Ridge, TN	1	1	ORNL-PCA	58 00	Physics research on reactivity effects and training. Instrumentation being upgraded.
Oak Ridge Critical Experiments Facility (DOE)	CEF	Oak Ridge, TN	1	1	OR-CEF	50 00	HFIR core reactivity measurements.
PNL Critical Mass Laboratory (DOE)	FEAS	Richland, WA	1	1	PNL-CML	76 00	Fuel element array system. Placed on cold standby 12-88.
PNL Critical Mass Laboratory (DOE)	Horizontal	Richland, WA	1	1	PNL-CML	61 00	Plutonium criticals. Placed on cold standby 12-88.
PNL Critical Mass Laboratory (DOE)	RSTM	Richland, WA	1	1	PNL-CML	63 00	Remote split table machine. Placed on cold standby 12-88.
Rensselaer Polytechnic Institute, Troy, NY (NRC)		Troy, NY	1	1	Rensselaer	66 00	Critical experiment assembly.

2. MILITARY

OPERABLE

Knolls Atomic Power Laboratory (DOE)	FCPE	Schenectady, NY	2	1	KAPL	70 00	Full core physics experiment.
Lockheed Aircraft Co., Critical Facility for RER (NRC)	CERF	Dawsonville, GA	1	1	Lockheed	58 00	RER core configurations.
Nuclear Safety Facility, Rocky Flats Plant (DOE)	Horizontal	Golden, CO	0	0	RFP-NSF	65 00	Critical-configuration safety tests.
Nuclear Safety Facility, Rocky Flats Plant (DOE)	Solution	Golden, CO	1	1	RFP-NSF	65 00	Critical-configuration safety tests.
Nuclear Safety Facility, Rocky Flats Plant (DOE)	Tank	Golden, CO	0	0	RFP-NSF	65 00	Critical-configuration safety tests.
Nuclear Safety Facility, Rocky Flats Plant (DOE)	Vertical	Golden, CO	0	0	RFP-NSF	65 00	Critical-configuration safety tests.

REACTORS AND FACILITIES SHUTDOWN OR DISMANTLED

REACTORS AND FACILITIES SHUTDOWN OR DISMANTLED

1. POWER REACTORS

PART 1 CIVILIAN REACTORS (DOMESTIC)

A. Central-Station Electric Power Plants

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Power Licensed MW(t)	Initial criticality (yr mo)	Shutdown permanently (yr mo)	Comment
Boiling Nuclear Superheater Power Station (AEC and Puerto Rico Water Resources Authority)	Punta Higuera, PR	Comb.	Boiling water, integral nuclear superheat	16.5	50.0	64 00	68 00	
Carolinas–Virginia Tube Reactor (Carolinas–Virginia Nuclear Power Associates, Inc.)	Parr, SC	West.	Pressure tube, heavy water	17.0	64.0	63 00	67 01	The last CVTR shutdown occurred Jan. 24, 1967. A license amendment issued June 14, 1967, authorizes CVNPA to possess but not operate the CVTR.
Dresden Nuclear Power Station, Unit 1 (Commonwealth Edison Co.) [50-010]	Morris, IL	GE	Boiling water	200.0	700.0	59 00	78 10	
Elk River Reactor (AEC and Rural Cooperative Power Association)	Elk River, MN	AC	Boiling water	22.0	58.2	62 00	68 02	The Elk River Reactor was shut down due to technical problems in February 1968; in 1974, dismantling and removal of this facility was completed.
Enrico Fermi Atomic Power Plant, Unit 1 (Power Reactor Development Co.) [50-16]	Lagoona Beach, MI	PRDC	Sodium cooled, fast	60.9	200.0	63 00	72 09	
Fort St. Vrain Nuclear Generating Station (Public Service Company of Colorado) [50-267]	Platteville, CO	GA	High temperature, gas cooled	330.0	842.0	74 01	89 08	
Hallam Nuclear Power Facility, Sheldon Station (AEC and Consumers Public Power District)	Hallam, NE	AI	Sodium graphite	75.0	240.0	62 00	64 09	The Hallam Nuclear Power Facility was shut down in September 1964 due to moderator-can failures. Entombment of the reactor was completed in 1968.
Humboldt Bay Power Plant, Unit 3 (Pacific Gas & Electric Co.) [50-133]	Eureka, CA	GE	Boiling water	65.0	242.0	63 00	76 07	
Indian Point Station, Unit 1 (Consolidated Edison Co. of New York, Inc.) [50-3]	Buchanan, NY	B&W	Pressurized water	265.0	615.0	62 00	74 10	In the Consolidated Edison Indian Point Station, the 615 MW(t) was increased by an oil-fired superheater to produce 265 MW(e) net.

A. Central-Station Electric Power Plants (Continued)

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Power Licensed MW(t)	Initial criticality (yr mo)	Shutdown permanently (yr mo)	Comment
La Crosse (Genoa) Nuclear Generating Station (Dairyland Power Cooperative) [50-409]	La Crosse, WI	AC	Boiling water	48.0	165.0	67 07	87 04	
Pathfinder Atomic Plant (Northern States Power Co.)	Sioux Falls, SD	AC	Boiling water	58.5	190.0	64 00	67 09	The Pathfinder Plant has been shut down since November 1967. On Sept. 9, 1968, Northern States Power Company announced plans to install gas-fired boilers for operation the summer of 1969.
Peach Bottom Atomic Power Station, Unit 1 (Philadelphia Electric Co.) [50-171]	Peach Bottom, PA	GA	High temperature gas cooled	40.0	115.0	66 00	74 10	
Piqua Nuclear Power Facility (AEC and City of Piqua)	Piqua, OH	AI	Organic cooled and moderated	11.4	45.5	63 00	66 00	The dismantlement program for the Piqua Nuclear Power Facility was completed in February 1969.
Shippingport Atomic Power Station (DOE and Duquesne Light Co.)	Shippingport, PA	West.	Pressurized water	60.0	236.0	57 00	82 10	The first core for the Shippingport station began power operation in 1957, with a capacity rating of 60 MW(e). The second core began power operation in 1965, with a capacity rating of 90 MW(e). The third core, a light water breeder reactor (LWBR), began power operation in 1977, with a capacity rating of 60 MW(e). Owned by the Department of Energy, the reactor plant was shut down on Oct. 1, 1982. All spent fuel was removed in 1984, and the reactor plant was turned over to the remedial action program within DOE/NE for decommissioning.
Three Mile Island Nuclear Station, Unit 2 (GPU Nuclear Corp.) [50-320]	Middletown, PA	B&W	Pressurized water	906.0	2772.0	78 00	79 03	The Three Mile Island Nuclear Station, Unit 2, has been shut down since the 3-28-79 accident. Core removal is in progress.

B. Dual-Purpose Plants

(No reactors in this category.)

C. Propulsion (Maritime)

Name and/or owner	Nuclear designer	Shipbuilder	Type	Maximum shaft horsepower	Licensed power MW(e)	Start-up (yr mo)	Shut-down (yr mo)
Nuclear Ship SAVANNAH (Maritime Administration)	B&W	NYSC	Pressurized water	22,000	80	61 00	71 00

2. EXPERIMENTAL POWER-REACTOR SYSTEMS

A. Electric-Power Systems

Name (DOE or NRC). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Designation. Type. Principal nucl. contr.	Comment
Boiling Reactor Experiment No. 1 (DOE). INEL Site, ID	0.0	1,400.0	0.0	0.0	0.0	53 00	54 00	BORAX-1. Boiling water. ANL	
Boiling Reactor Experiment No. 5 (DOE). INEL Site, ID	2,600.0	20,000.0	0.0	0.0	0.0	62 00	64 00	BORAX-5. Boiling water, integral nuclear superheat. ANL	
Boiling Reactor Experiments (DOE). INEL Site, ID	2,400.0	15,500.0	0.0	0.0	0.0	54 00	58 06	BORAX-2,-3,-4. Boiling water. ANL	This facility was originally built and operated in 1954 as the Boiling Reactor Experiment No. 2 (BORAX-2). With the addition of a turbogenerator, it operated during 1955 as BORAX-3 and on 7-17-55 produced sufficient electricity to light and power Archo, ID–a U.S. first. BORAX-4, a further modification, operated from 12-56 to 6-58, when the experiment was shut down.
ESADA Vallecitos Experimental Superheat Reactor (NRC). Pleasanton, CA	0.0	17,000.0	0.0	0.0	0.0	63 00	67 02	EVESR. Light-water moderated, superheater. GE	Owner: Empire States Atomic Development Associates and General Electric Company.
Experimental Beryllium Oxide Reactor (DOE). INEL Site, ID	0.0	10,000.0	0.0	0.0	0.0			EBOR. Gas cooled, BeO moderated. GA	The EBOR reactor experiment was terminated in December 1966 prior to the completion of construction.

A. Electric-Power Systems (Continued)

Name (DOE or NRC). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Designation. Type. Principal nucl. contr.	Comment
Experimental Boiling Water Reactor (DOE). Argonne, IL	4,000.0	100,000.0	0.0	0.0	0.0	56 00	67 06	EBWR. Boiling water. ANL	The EBWR achieved 100,000 kW(t) 11-11-62. Operation of EBWR in the Boiling Water Program was closed out 12-62. The reactor was used in support of the Plutonium Recycle Program and attained criticality using plutonium as its principal fuel 9-22-65. In support of that program, it operated at power levels as high as 70,000 kW(t). Operation in that program was completed 6-67.
Experimental Breeder Reactor No. 1 (DOE). INEL Site, ID	150.0	1,400.0	0.0	0.0	0.0	51 00	64 00	EBR-1. NaK-cooled, fast. ANL	In a trial run 12-21-51 and 12-22-51, EBR-1 generated the world's first electric power from nuclear energy and was the first to demonstrate, in 7-53, the feasibility of breeding and the compatibility with breeding economy of sodium–potassium alloy as a liquid-metal coolant. It operated with a plutonium-bearing core (Mark IV) from 11-62 to 12-63. The reactor was decommissioned and dismantled early in 1964. The facility was dedicated as a historic landmark 8-26-66. It is open to the public from Memorial Day week-end to Labor day weekend, annually.
Experimental Gas Cooled Reactor (DOE). Oak Ridge, TN	21,900.0	84,300.0	0.0	0.0	0.0			EGCR. Gas cooled, graphite moderated. KE-AC	The EGCR project was terminated 1-66 prior to the completion of construction.
Experimental Organic Cooled Reactor (DOE). INEL Site, ID	0.0	40,000.0	0.0	0.0	0.0			EOCR. Organic cooled and moderated. Fluor-AI	EOCR construction was terminated 12-62. The facility was moth-balled prior to operation.
Heavy Water Components Test Reactor (DOE). SRL, Aiken, SC	0.0	61,100.0	0.0	0.0	0.0	62 00	64 00	HWCTR. Pressurized heavy water. Du Pont	
Homogeneous Reactor Experiment No. 1 (DOE). Oak Ridge, TN	140.0	1,000.0	0.0	0.0	0.0	52 00	54 00	HRE-1. Aqueous homogeneous solution (UO_2SO_4). ORNL	

Homogeneous Reactor Experiment No. 2 (DOE). Oak Ridge, TN	300.0	5,200.0	0.0	0.0	0.0	57 00	61 00	HRE-2. Aqueous homogeneous solution (UO_2SO_4). ORNL	
Los Alamos Molten Plutonium Reactor Experiment (DOE). Los Alamos, NM	0.0	1,000.0	0.0	0.0	0.0	61 00	63 00	LAMPRE-1. Fast molten plutonium fueled, sodium cooled. LANL	
Los Alamos Power Reactor Experiment No. 1 (DOE). Los Alamos, NM	0.0	2,000.0	0.0	0.0	0.0	56 00	57 00	LAPRE-1. Aqueous homogeneous (phosphoric acid). LANL	
Los Alamos Power Reactor Experiment No. 2 (DOE). Los Alamos, NM	0.0	1,000.0	0.0	0.0	0.0	59 00	59 00	LAPRE-2. Aqueous homogeneous (phosphoric acid). LANL	
Molten Salt Reactor Experiment (DOE). Oak Ridge, TN	0.0	8,000.0	0.0	0.0	0.0	65 00	69 00	MSRE. Single region, graphite moderated. ORNL	
Organic Moderated Reactor Experiment (DOE). INEL Site, ID	0.0	12,000.0	0.0	0.0	0.0	57 00	63 00	OMRE. Organic cooled and moderated. AI	OMRE demonstrated the technical and economic feasibility of using liquid hydrocarbon terphenyls as coolant and/or moderator.
Plutonium Recycle Test Reactor (DOE). Richland, WA	0.0	70,000.0	0.0	0.0	0.0	60 00	69 00	PRTR. Pressure tube, heavy water moderated and cooled. WHC	
Saxton Nuclear Experimental Reactor Project (DOE). Saxton, PA	3,000.0	23,500.0	0.0	0.0	0.0	62 00	72 00	No Desg. Pressurized water. West.	Owner: Saxton Nuclear Experimental Corp.
Sodium Reactor Experiment (DOE). Santa Susana, CA	5,700.0	20,000.0	0.0	0.0	0.0	57 00	64 02	SRE. Sodium graphite. AI	SRE operated at 20 MW(t) until shut down 2-64 for modification to permit an increase in power level to 30 MW(t). On 12-2-66, deactivation of SRE was announced. Owners: DOE and Southern California Edison Co.
Southwest Experimental Fast Oxide Reactor (NRC). Strickler, AR	0.0	20,000.0	0.0	0.0	0.0	69 00	72 00	SEFOR. Sodium cooled, fast. GE	Owner: Southwest Atomic Energy Associates.
Ultra High Temperature Reactor Experiment (DOE). Los Alamos, NM	0.0	3,000.0	0.0	0.0	0.0	68 00	70 00	UHTREX. Helium cooled. LANL	
Vallecitos Boiling Water Reactor (NRC). Pleasanton, CA	5,000.0	33,000.0	0.0	0.0	0.0	57 00	63 12	VBWR. Boiling water. GE	Owner: General Electric Company and Pacific Gas & Electric Co.

B. Space Nuclear Auxiliary Power (SNAP)

Name (DOE or NRC). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Designation. Type. Principal nucl. contr.	Comment
SNAP-02 Developmental System (DOE). Santa Susana, CA	0.0	0.0	0.0	0.0	50.0	61 00	63 00	S2DS. NaK-cooled. AI	
SNAP-02 Experimental Reactor (DOE). Santa Susana, CA	0.0	0.0	0.0	0.0	50.0	59 00	60 00	SER. NaK-cooled. AI	
SNAP-02/10A TSF Shielding Experiment (DOE). Oak Ridge, TN	0.0	0.0	0.0	0.0	10.0	67 00	73 00	SNAP-TSF. NaK-cooled. AI-ORNL	
SNAP-08 Developmental Reactor (DOE). Santa Susana, CA	0.0	0.0	0.0	0.0	600.0	68 00	69 00	S8DR. NaK-cooled. AI	
SNAP-08 Experimental Reactor (DOE). Santa Susana, CA	0.0	0.0	0.0	0.0	600.0	62 00	65 00	S8ER. NaK-cooled. AI	
SNAP-10A Flight System (DOE). In orbit, USA	0.0	0.0	0.0	0.5	39.0	65 00	65 00	S10FS-4. NaK-cooled. AI	S10FS-4 operated in orbit during April–May 1965. Operation terminated unexpectedly after 43 days at power, probably owing to a sequence of failures of electrical components of the spacecraft with resulting spurious commands shutting down the reactor. An identical ground test unit, S10FS-3, operated successfully for more than a year before being shut down in 1966.
SNAP-10A Flight System (DOE). Oak Ridge, TN	0.0	0.0	0.0	0.5	39.0	(Spare)		S10FS-5. NaK-cooled. AI	
SNAP-10A Flight System Ground Test No. 1 (DOE). Santa Susana, CA	0.0	0.0	0.0	0.5	39.0	64 00	64 00	S10FS-1. NaK-cooled. AI	
SNAP-10A Flight System Ground Test No. 3 (DOE). Santa Susana, CA	0.0	0.0	0.0	0.5	39.0	64 00	66 00	S10FS-3. NaK-cooled. AI	See comment for SNAP-10 Flight System, S10FS-4.

C. Space Propulsion

Fuel Element Test Bed (DOE). NRDS, NV	0.0	0.0	44,000.0	0.0	0.0	72 00	72 00	NF-1. Open cycle, gaseous hydrogen. LANL
Fuel Element Test Reactor (DOE). NRDS, NV	0.0	0.0	514,000.0	0.0	0.0	Indef.	68 00	Pewee-1. Open cycle, liquid hydrogen. LANL
Fuel Element Test Reactor (DOE). NRDS, NV	0.0	0.0	514,000.0	0.0	0.0	Indef.	73 00	Pewee-2. Open cycle, liquid hydrogen. LANL
Ground Experimental Engine Experiment (DOE). NRDS, NV	0.0	0.0	1,100,000.0	0.0	0.0	Indef.	73 00	XE-Backup. Open cycle, liquid hydrogen. AG-West.
Ground Experimental Engine Experiment (DOE). NRDS, NV	0.0	0.0	1,100,000.0	0.0	0.0	68 00	69 00	XE-Prime. Open cycle, liquid hydrogen. AG-West.
Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV	0.0	0.0	109,600.0	0.0	0.0	64 00	64 00	NRX-A2. Open cycle, liquid hydrogen. AG-West.
Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV	0.0	0.0	1,100,000.0	0.0	0.0	65 00	65 00	NRX-A3. Open cycle, liquid hydrogen. AG-West.
Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV	0.0	0.0	1,120,000.0	0.0	0.0	66 00	66 00	NRX-A5. Open cycle, liquid hydrogen. AG-West.
Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV	0.0	0.0	1,199,000.0	0.0	0.0	67 00	67 00	NRX-A6. Open cycle, liquid hydrogen. AG-West.
Nuclear Rocket Reactor Engine System Test (NERVA) (DOE). NRDS, NV	0.0	0.0	1,155,000.0	0.0	0.0	66 00	66 00	NRX-A4/EST. Open cycle, liquid hydrogen. AG-West.
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	70,000.0	0.0	0.0	59 00	59 00	Kiwi-A. Open cycle, gaseous hydrogen. LANL
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	85,000.0	0.0	0.0	60 00	60 00	Kiwi-A Prime. Open cycle, gaseous hydrogen. LANL

C. Space Propulsion (Continued)

Name (DOE or NRC). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Designation. Type. Principal nucl. contr.	Comment
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	100,000.0	0.0	0.0	60 00	60 00	Kiwi-A3. Open cycle, gaseous hydrogen. LANL	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	300,000.0	0.0	0.0	61 00	61 00	Kiwi-B1A. Open cycle, gaseous hydrogen. LANL	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	90,000.0	0.0	0.0	62 00	62 00	Kiwi-B1B. Open cycle, liquid hydrogen. LANL	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	500,000.0	0.0	0.0	62 00	62 00	Kiwi-B4A. Open cycle, liquid hydrogen. LANL	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	1,000,000.0	0.0	0.0	64 00	64 00	Kiwi-B4D. Open cycle, liquid hydrogen. LANL	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	950,000.0	0.0	0.0	64 00	64 00	Kiwi-B4E. Open cycle, liquid hydrogen. LANL	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	1,070,000.0	0.0	0.0	65 00	65 00	Phoebus 1A. Open cycle, liquid hydrogen. LANL	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	1,400,000.0	0.0	0.0	67 00	67 00	Phoebus 1B. Open cycle, liquid hydrogen. LANL	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	0.0	0.0	4,200,000.0	0.0	0.0	68 00	68 00	Phoebus 2A. Open cycle, liquid hydrogen. LANL	

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

A. General Irradiation Test

Engineering Test Reactor (DOE). INEL, ID	0.0	0.0	175,000.0	0.0	0.0	57 00	81 00	ETR. Tank. KE-GE	Reactor was shut down in 1973 for modifications and insertion of

									Sodium Loop Safety Facility (SLSF) loop. Operation resumed in 1975. Deactivated in 1981 and no longer operable.
General Electric Testing Reactor (NRC). Pleasanton, CA	0.0	0.0	50,000.0	0.0	0.0	58 00	77 00	GETR. Tank. Owner	
Materials Testing Reactor (DOE). INEL, ID	0.0	0.0	40,000.0	0.0	0.0	52 00	70 00	MTR. Tank. ORNL-ANL-Blaw-Knox	In August 1958 the MTR was operated with an experimental plutonium core at power levels up to 30,000 kW(t). It demonstrated the ability of plutonium fuel elements to perform satisfactorily in a high-flux research or test reactor. Operation as a test reactor was terminated 6-30-69, and a Plutonium-240 (Phoenix) core was run in FY 1970. Reactor was decommissioned in 1974.
Plum Brook Reactor Facility (NRC). Sandusky, OH	0.0	0.0	60,000.0	0.0	0.0	61 00	74 00	NASA-TR. Tank. NASA	
Westinghouse Testing Reactor (DOE). Waltz Mill, PA	0.0	0.0	60,000.0	0.0	0.0	59 00	62 00	WTR. Tank. Owner	

B. High-Power Research and Test

Ames Laboratory Research Reactor (DOE). Ames, IA	0.0	0.0	5,000.0	0.0	0.0	65 00	77 00	ALRR. Heavy water. AMF	
Argonne Research Reactor (DOE). Argonne, IL	0.0	0.0	5,000.0	0.0	0.0	54 00	79 00	CP-5. Heavy water. ANL	
Babcock & Wilcox Nuclear Development Center Test Reactor (NRC). Lynchburg, VA	0.0	0.0	6,000.0	0.0	0.0	64 00	71 00	BAWTR. Pool. Owner	
Industrial Reactor Laboratories, Inc. (NRC). Plainsboro, NJ	0.0	0.0	5,000.0	0.0	0.0	58 00	75 00	IRL. Pool. AMF	
Oak Ridge Research Reactor (DOE). Oak Ridge, TN	0.0	0.0	30,000.0	0.0	0.0	58 00	87 00	ORR. Tank. ORNL	The servo system for the ORR, completed in August 1986, consisted of a programmable controller and associated auxiliary equipment for signal conditioning and input/output functions. The functions of the programmable controller were: (1) demand control; (2) primary and pool flow and differential temperature calculations; (3) reactor heat power calculations; (4) neutron flux calibration; and (5) demand-flux comparison and rod positioning. A new ORR safety system was installed in 1986. →

B. High-Power Research and Test (Continued)

Name (DOE or NRC). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Designation. Type. Principal nucl. contr.	Comment
									Three channels of neutron flux information were arranged in two-out-of-three coincidences to permit online testing and repair and to prevent an unnecessary shutdown, should a single channel have failed.
Sandia Engineering Reactor (DOE). Kirtland AFB, NM	0.0	0.0	5,000.0	0.0	0.0	61 00	70 00	SER. Tank. Sandia	

C. Safety Research and Test

King Intense Neutron Generator (DOE). Los Alamos, NM	0.0	0.0	0.0	0.0	0.0	72 00	77 00	Kinglet. Homogeneous. LANL	Transient.
Kiwi-Transient Test Reactor (DOE). NRDS, ID	0.0	0.0	0.0	0.0	0.0	65 00	65 00	Kiwi-TTR. Kiwi/NERVA. LANL	
Loss of Fluid Test (DOE). INEL, ID	0.0	0.0	55,000.0	0.0	0.0	78 00	85 07	LOFT. Pressurized water. EG&G-ID	LOFT covered most of the concerns related to light-water safety. The first tests were done for NRC, and the last eight were done for a consortium of OECD countries and the U.S. The last two fission-product-release tests measured release and transport of fission products. There was an intentional core damage causing a partial meltdown. Inactivation, which started after the last test in July 1985, was scheduled to be completed by March 1987.
SNAP-10A Transient Test No. 2 (DOE). INEL, ID	0.0	0.0	0.0	0.0	0.0	65 00	66 01	SNAPTRAN-2. Be-reflected SNAP-10A. AI-PPC	The SNAPTRAN series of experiments was designed to develop, in a land-based environment, safety information on space auxiliary power reactors through excursion testing at various temperatures and rates of reactivity insertion. The destructive experiments approach the maximum credible accidents postulated for SNAP reactor systems. SNAPTRAN-1 was converted to SNAPTRAN-2 for destructive testing 1-66.

SNAP-10A Transient Test No. 3 (DOE). INEL, ID	0.0	0.0	0.0	0.0	0.0	64 00	64 00	SNAPTRAN-3. H_2O-reflected SNAP-10A. PPC-AI	
Special Power Excursion Reactor Test No. 1 (DOE). INEL, ID	0.0	0.0	0.0	0.0	0.0	55 00	64 00	SPERT-1. Open tank. PPC	
Special Power Excursion Reactor Test No. 2 (DOE). INEL, ID	0.0	0.0	0.0	0.0	0.0	60 00	65 00	SPERT-2. Pressurized water. PPC	
Special Power Excursion Reactor Test No. 3 (DOE). INEL, ID	0.0	0.0	0.0	0.0	0.0	58 00	68 00	SPERT-3. Pressurized water. PPC	
Special Power Excursion Reactor Test No. 4 (DOE). INEL, ID	0.0	0.0	0.0	0.0	0.0	62 00	70 00	SPERT-4. Pool. INC	

D. General Research

Accelerator Pulsed Fast Critical Assembly (DOE). La Jolla, CA	0.0	0.0	1.0	0.0	0.0	67 00	73 00	APFA-III. Fast. GA	The APFA-III was previously operated as the KUKLA Prompt Critical Assembly at Lawrence Livermore National Laboratory at Livermore, CA.
American Standard Inc. (NRC). Mountain View, CA	0.0	0.0	0.0	0.0	0.0	58 00	60 00	UTR-1. Graphite/water. AS, Inc.	This reactor was shipped abroad for exhibition purposes in the USAEC Atoms for Peace Exhibit in the Tokyo International Trade Fair in 1959, and in Cairo, Egypt, and Lahore, Pakistan, in 1960.
Annular Core Pulsed Reactor (DOE). Kirtland AFB, East, NM	0.0	0.0	0.0	0.0	0.0	67 00	77 00	ACPR. U-Zr hydride. GA	In 1977 the Annular Core Pulsed Reactor (ACPR) was shut down. After replacement of fuel and other modifications, the unit was renamed the Annular Core Research Reactor.
Argonne CP-3, rebuilt as CP-3' (DOE). Palos Park, IL	0.0	0.0	300.0	0.0	0.0	44 00	63 00	CP-3'. Heavy water. Met. Lab.	
Argonne Low Power Research Reactor (DOE). Argonne, IL	0.0	0.0	250.0	0.0	0.0	62 00	70 00	Juggernaut. Graphite/water. ANL	After the assembly and operation of this reactor in the government exhibit at Geneva in 9-58, it was dismantled and returned to ANL, where it was rebuilt as a 250-kW(t) Juggernaut.
Argonne National Laboratory (DOE). Argonne, IL	0.0	0.0	0.0	0.0	0.0	57 00	72 00	AGN-201-108. Homog. solid. AGN	

D. General Research (Continued)

Name (DOE or NRC). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Designation. Type. Principal nucl. contr.	Comment
Argonne Nuclear Assembly for University Training (DOE). Argonne, IL	0.0	0.0	10.0	0.0	0.0	57 00	72 00	Argonaut (CP-11). Graphite/water. ANL	
Argonne Thermal Source Reactor (DOE). Argonne, IL	0.0	0.0	10.0	0.0	0.0	57 00	88 00	ATSR. Thermal. ANL	
Atomics International (NRC). Canoga Park, IL	0.0	0.0	0.0	0.0	0.0	57 00	58 00	L-47. Homogeneous. AI	
Babcock & Wilcox Lynchburg Pool Reactor (NRC). Lynchburg, VA	0.0	0.0	1,000.0	0.0	0.0	58 00	81 00	LRP. Pool. Owner	
Battelle Memorial Institute (NRC). West Jefferson, OH	0.0	0.0	2,000.0	0.0	0.0	56 00	74 00	BRR. Pool. AMF	
Brookhaven Graphite Research Reactor (DOE). Upton, NY	0.0	0.0	20,000.0	0.0	0.0	50 00	69 00	BGRR. Air cooled, graphite moderated. AU, Inc.	
Brookhaven Neutron Source Reactor No. 1 (DOE). Upton, NY	0.0	0.0	100.0	0.0	0.0	58 00	70 00	SCHIZO. Tank. AU, Inc.	
Brookhaven Neutron Source Reactor No. 2 (DOE). Upton, NY	0.0	0.0	100.0	0.0	0.0	65 00	70 00	PHRENIC. Tank. AU, Inc.	
Chicago Pile 1, rebuilt as CP-2 (DOE). Chicago, IL	0.0	0.0	0.2	0.0	0.0	42 00	54 00	CP-2. Graphite Met. Lab.	In 1943 the Manhattan Engineer District disassembled Chicago Pile 1 and rebuilt it at Palos Park, IL, as Chicago Pile 2. CP-2 had a thermal-power level of 10 kW.
Curtiss-Wright Nuclear Research Laboratory of the Commonwealth of Pennsylvania (NRC). Quehanna, PA	0.0	0.0	1,000.0	0.0	0.0	58 00	66 00	CWRR. Pool. Owner	
DOE Demonstration Reactor (DOE). Oak Ridge, TN	0.0	0.0	10.0	0.0	0.0	69 00	69 00	Demo Reac. Pool. Lockheed	This reactor was formerly called the Latin American Demonstration Reactor and was operated initially

									in São Paulo, Brazil, 10-69. It is currently in storage at Oak Ridge.
European-Asian Exhibit Program (DOE). Oak Ridge, TN	0.0	0.0	10.0	0.0	0.0	63 00	69 00	EAEP. Pool. Lockheed	This reactor was operated in the USAEC Atoms for Peace Exhibit in Vienna, Austria, 6-63; Belgrade, Yugoslavia, 9-63; Madrid, Spain, 4-64; Lisbon, Portugal, 4-65; Utrecht, Netherlands, 3-66; Dublin, Ireland, 9-66 to 10-66; Ankara, Turkey, 4-67 to 5-67; Tehran, Iran, 11-67 to 12-67; Taipei, Taiwan, 4-68 to 5-68; Seoul, Korea, 9-68 to 10-68; Manila, Philippines, 2-69 to 3-69; and Bucharest, Romania, 10-69.
Fast Neutron Source Reactor (DOE). Upton, NY	0.0	0.0	0.0	0.0	0.0	67 00	70 00	BNL/FS-1. Fast. BNL	
General Atomics Technologies (DOE). San Diego, CA	0.0	0.0	50.0	0.0	0.0	60 00	60 00	TRIGA-Mk I. U-Zr hydride. Owner	This TRIGA-Mk II was operated at the New Delhi World Agricultural Fair in 1960. It was dismantled for storage in California by Chevron USA Corporation. Owner: World Agricultural Fair–U.S. Exhibit Reactor.
High Temperature Lattice Test Reactor (DOE). Richland, WA	0.0	0.0	2.0	0.0	0.0	67 00	71 00	HTLTR. Graphite moderated. PNL	
Illinois Institute of Technology Research Institute (DOE). Chicago, IL	0.0	0.0	75.0	0.0	0.0	56 00	67 00	ARR (L-54). Homogeneous. AI	Owner: Armour Research Foundation.
Kinetic Experiment on Water Boilers (NRC). Santa Susana, CA	0.0	0.0	0.0	0.0	0.0	56 00	67 00	KEWB. Homogeneous. AI	The KEWB reactor was operated by AI from 1956 to 1967 as the Kinetic Experiment on Water Boilers. Owner: Rockwell International. No power listed: transient.
Livermore Pool Type Reactor (DOE). Livermore, CA	0.0	0.0	3,000.0	0.0	0.0	57 00	80 00	LPTR. Tank. FW	
Livermore Water Boiler (DOE). Livermore, CA	0.0	0.0	0.5	0.0	0.0	53 00	61 00	LIWB. Homogeneous. AI	
Lockheed Aircraft Corp. (NRC). Dawsonville, GA	0.0	0.0	0.0	0.0	0.0	60 00	60 00	No Desg. Pool. Lockheed	
Los Alamos Fast Reactor (DOE). Los Alamos, NM	0.0	0.0	25.0	0.0	0.0	46 00	53 00	Clementine. Fast, plutonium fuel, mercury cooled. LANL	
Los Alamos LOPO Reactor (DOE). Los Alamos, NM	0.0	0.0	0.0	0.0	0.0	44 00	44 00	LOPO. Homogeneous. LANL	

D. General Research (Continued)

Name (DOE or NRC). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Designation. Type. Principal nucl. contr.	Comment
Los Alamos Water Boiler (DOE). Los Alamos, NM	0.0	0.0	5.5	0.0	0.0	44 00	50 00	HYPO. Homogeneous. LANL	
Los Alamos Water Boiler (DOE). Los Alamos, NM	0.0	0.0	25.0	0.0	0.0	50 00	74 00	SUPO. Homogeneous. LANL	
Louisiana State University Nuclear Science Center (DOE). Baton Rouge, LA	0.0	0.0	2.0	0.0	0.0	65 00	66 00	SNARE. Pool. Sandia	In 1965 and 1966 this reactor was operated at Sandia, NM, as SNARE. Prior to that time it was operated at INEL as the Shield Test Pool Reactor (SUSIE) in the Aircraft Nuclear Propulsion Program from 1959 to 1962. It was shut down in 1966 and transferred to Louisiana State University 6-66, where it was never assembled. Owner: Phillips Petroleum Co.
Low Intensity Test Reactor (DOE). Oak Ridge, TN	0.0	0.0	3,000.0	0.0	0.0	50 00	68 00	LITR. Tank. ORNL	
NASA Mock-Up Reactor (NRC). Sandusky, OH	0.0	0.0	100.0	0.0	0.0	63 00	73 00	MUR. LWR. Lockheed	
Northrop Corporate Laboratories (NRC). Hawthorne, CA	0.0	0.0	100.0	0.0	0.0	63 00	86 00	TRIGA-Mk F. U-Zr hydride. GA	Owner: Space Radiation Laboratory. This TRIGA reactor was capable of being pulsed and of steady-state operation.
Nuclear Effects Reactor (DOE). NTS, NV	0.0	0.0	0.0	0.0	0.0	62 00	70 00	FRAN. Prompt burst. LLNL/PPC	Until mid-1967 FRAN was operated by LLNL at the Nevada Test Site, and until 1970 it was operated in the former ML-1 reactor area at INEL. In mid-1970 it was transferred back to LLNL. Fuel was removed for processing.
Nuclear Effects Reactor (DOE). San Diego, CA	0.0	0.0	0.0	0.0	0.0	59 00	64 00	KUKLA. Prompt burst. LLNL	
Nuclear Examination Reactor (NRC). Santa Susana, CA	0.0	0.0	3.0	0.0	0.0	52 00	80 00	L-85 (AE-6). Homogeneous. AI	Ownership of this reactor was transferred to North American Rockwell 12-71 and was redesignated the

									Nuclear Examination Reactor or L-85 rather than AE-6. The AE-6, also designated WBNS, was built and first operated at Downey, CA. It was moved to Santa Susana in 1956.
Oak Ridge Graphite Reactor (DOE). Oak Ridge, TN	0.0	0.0	3,500.0	0.0	0.0	43 00	63 00	ORG. Graphite. CL	
Pawling Research Reactor (NRC). Pawling, NY	0.0	0.0	0.0	0.0	0.0	58 00	71 00	PRR. LWR. UNC	Owner: United Nuclear Corp.
Physical Constants Test Reactor (DOE). Richland, VA	0.0	0.0	0.1	0.0	0.0	55 00	72 00	PCTR. Graphite. PNL	
Radiation Effects Reactor (NRC). Dawsonville, GA	0.0	0.0	3,000.0	0.0	0.0	58 00	70 00	RER. Pool. Lockheed	The RER was previously used in the terminated Aircraft Nuclear Propulsion Program. A license authorizing Lockheed to operate the reactor as a commercial facility was issued 7-62, and 8-62 the USAF transferred the facility to the General Services Administration. Lockheed acquired title to the facility 3-65.
Rockwell International (NRC). Canoga Park, CA	0.0	0.0	0.0	0.0	0.0	58 00	74 00	L-77. Homogeneous. AI	
Sandia Pulsed Reactor (DOE). Kirtland AFB, East, NM	0.0	0.0	0.0	0.0	0.0	61 00	67 00	SPR. Prompt burst. Sandia	
Shield Test and Irradiation Reactor (DOE). Santa Susana, CA	0.0	0.0	1,000.0	0.0	0.0	61 00	72 00	STIR. Pool. AI	This reactor was previously designated STF for SNAP Shield Test Facility.
Thermal Test Reactor No. 2 (DOE). Richland, WA	0.0	0.0	0.1	0.0	0.0	55 00	72 00	TTR-2. Graphite. PNL	
Torrey Pines, TRIGA-Mk III Reactor (NRC). La Jolla, CA	0.0	0.0	1,500.0	0.0	0.0	66 00	73 00	TRIGA-Mk III. U-Zr hydride. Owner	Owner: General Atomic.
Tower Shielding Reactor (DOE). Oak Ridge, TN	0.0	0.0	500.0	0.0	0.0	54 00	58 00	TSR. BSR-type in tank. ORNL	
UTR Test Reactor (NRC). Mountain View, CA	0.0	0.0	0.0	0.0	0.0	61 00	63 00	No Desg. Graphite/water. Owner	Owner: American Radiator & Standard Sanitary Corp.
Westinghouse Nuclear Training Center (NRC). Zion, IL	0.0	0.0	10.0	0.0	0.0	72 00	87 00	WNTR. Tank. West.	

E. University Research and Teaching

Brigham Young University (NRC). Provo, UT	0.0	0.0	0.0	0.0	0.0	67 00	87 00	L-77. Homogeneous. AI	

E. University Research and Teaching (Continued)

Name (DOE or NRC). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Designation. Type. Principal nucl. contr.	Comment
California Polytechnic State University (NRC). San Luis Obispo, CA	0.0	0.0	0.0	0.0	0.0	73 00	80 00	AGN-201-100. Homog. solid. AGN	California Polytechnic State University received a permit in 12-71 to relocate AGN-201-100 and operate it on the university's campus. The unit was previously operated starting in 1956 at the Naval Postgraduate School, Monterey, CA. In 1980, AGN-201-100 was shut down and decommissioned.
California, Berkeley, University of (NRC). Berkeley, CA	0.0	0.0	1000.0	0.0	0.0	66 00	87 12	TRIGA-Mk III. U-Zr hydride. GA	
California, Los Angeles, University of, School of Engineering and Applied Science (NRC). Los Angeles, CA	0.0	0.0	100.0	0.0	0.0	60 00	84 00	Educator. Graphite/water. AMF	
California, Santa Barbara, University of (NRC). Santa Barbara, CA	0.0	0.0	0.0	0.0	0.0	74 00	86 00	L-77. Homogeneous. AI	
Catholic University of America (NRC). Washington, D.C.	0.0	0.0	0.0	0.0	0.0	57 00	86 00	AGN-201-101. Homog. solid. AGN	
Colorado State University (NRC). Fort Collins, CO	0.0	0.0	0.0	0.0	0.0	57 00	74 00	AGN-201-109. Homog. solid. AGN	
Columbia University (NRC). New York, NY	0.0	0.0	250.0	0.0	0.0	Licensed	85 00	TRIGA-Mk II. U-Zr hydride. GA	The Columbia University TRIGA-Mk II was licensed to operate by NRC. However, the City of New York has not authorized operation. Therefore Columbia University has not procured fuel. The license was terminated in 1985.
Delaware, University of (NRC). Newark, DE	0.0	0.0	0.0	0.0	0.0	58 00	78 00	AGN-201-113. Homog. solid. AGN	
Georgia Institute of Technology (NRC). Atlanta, GA	0.0	0.0	0.0	0.0	0.0	68 00	85 00	AGN-201-104. Homog. solid. AGN	AGN-201-104 operated at the University of Akron (Ohio) from 1957 until transferred to the Georgia Institute of Technology in 1967. Operations at that facility began in 1968. Decommissioning of AGN-201-104 was achieved in 1986.

Kansas, University of (NRC). Lawrence, KS	0.0	0.0	10.0	0.0	0.0	61 00	87 00	Model 4180. Pool. BAC	
Leland Stanford University (NRC). Palo Alto, CA	0.0	0.0	10.0	0.0	0.0	59 00	74 00	No Desg. Pool. GE	
Memphis State University (NRC). Memphis, TN	0.0	0.0	0.0	0.0	0.0	77 00	85 00	AGN-201-108. Homog. solid. AGN	
Michigan State University (NRC). East Lansing, MI	0.0	0.0	250.0	0.0	0.0	69 00	89 00	TRIGA-Mk I. U–Zr hydride	The core of the Michigan State University reactor operated in the University of Illinois TRIGA facility from 1960 until transferred in 1968. The reactor has been decommissioned. The license is expected to be terminated.
Mississippi State University (NRC). State College, MS	0.0	0.0	0.0	0.0	0.0			RRR. Homogeneous. Owner-NSA	This reactor was originally operated by North Carolina State University as the Raleigh Research Reactor (RRR). It was transferred 3-66 to Mississippi State University for reactivation. The RRR was dismantled by N.C. State in 1963. Owing to funding problems, this reactor was never activated. Late in 1981 it was shipped to Barnwell, SC, for disposal.
Nevada, University of (NRC). Reno, NV	0.0	0.0	0.0	0.0	0.0	63 00	74 00	L-77. Homogeneous. AI	
North Carolina State University (NRC). Raleigh, NC	0.0	0.0	10.0	0.0	0.0	60 00	73 00	No Desg. Graphite/water. Cook	
Oklahoma, University of (NRC). Norman, OK	0.0	0.0	0.0	0.0	0.0	58 00	88 00	AGN-211-102. Homog. solid, pool. AGN	Possession only license, 1988.
Oregon State University (NRC). Corvallis, OR	0.0	0.0	0.0	0.0	0.0	58 00	74 00	AGN-201-114. Homog. solid. AGN	
Polytechnic Institute of New York (NRC). New York, NY	0.0	0.0	0.0	0.0	0.0	67 00	74 00	AGN-201M-105. Homog. solid. AGN	In 1957–1962, AGN-201M-105 was owned and operated by the National Naval Medical Center, Bethesda, MD. Title to the reactor was transferred to New York University early in 1964. A license to operate was issued 4-67.
Puerto Rico Nuclear Center (DOE). Mayagüez, PR	0.0	0.0	0.0	0.0	0.0	59 00	79 00	L-77. Homogeneous. AI	Owner: The Center for Environmental and Energy Research (formerly Puerto Rico Nuclear Center).
Puerto Rico Nuclear Center (DOE). Mayagüez, PR	0.0	0.0	2000.0	0.0	0.0	72 00	76 00	TRIGA-FLIP. Pool-TRIGA core. GA	This reactor was operated at the Puerto Rico Nuclear Center from 1960 to 10-76; it was converted

E. University Research and Teaching (Continued)

Name (DOE or NRC). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Designation. Type. Principal nucl. contr.	Comment
									to the TRIGA-FLIP in 1972. It has been moved to the Neutron Radiography Facility at the National Engineering Laboratory in Idaho.
Tuskegee Institute (NRC). Tuskegee, AL	0.0	0.0	0.0	0.0	0.0	74 00	84 12	AGN-201-102. Homog. solid. AGN	AGN-201-102 was operated at Oklahoma State University, Stillwater, OK, from 1957 until transferred to Tuskegee Institute in 1972; there it was licensed to operate but was never started up. Tuskegee Institute returned the fuel to the Department of Energy, and the operating license was terminated 10-12-84.
Virginia Polytechnic Institute (NRC). Blacksburg, VA	0.0	0.0	100.0	0.0	0.0	59 00	84 00	UTR-10. Graphite/water. AS Inc.	
West Virginia University (NRC). Morgantown, WV	0.0	0.0	0.0	0.0	0.0	59 00	72 00	AGN-211-103. Homog. solid, pool. AGN	
William Marsh Rice University (NRC). Houston, TX	0.0	0.0	0.0	0.0	0.0	59 00	65 00	AGN-211-101. Homog. solid, pool. AGN	
Wyoming, University of (NRC). Laramie, WY	0.0	0.0	0.0	0.0	0.0	59 00	74 00	L-77. Homogeneous. AI	

Name (all owned by DOE)	Designation	Location	Nuclear designer	Type	Authorized power kW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Comment
B Reactor	B Reactor	Richland, WA	Du Pont	Graphite	0.0	44 00	68 00	
C Reactor	C Reactor	Richland, WA	GE	Graphite	0.0	52 00	69 00	
D Reactor	D Reactor	Richland, WA	Du Pont	Graphite	0.0	44 00	67 00	
DR Reactor	DR Reactor	Richland, WA	GE	Graphite	0.0	50 00	64 00	
F Reactor	F Reactor	Richland, WA	Du Pont	Graphite	0.0	45 00	65 00	

H Reactor	H Reactor	Richland, WA	GE	Graphite	0.0	49 00	65 00	
KE Reactor	KE Reactor	Richland, WA	GE	Graphite	0.0	55 00	71 00	
KW Reactor	KW Reactor	Richland, WA	GE	Graphite	0.0	55 00	70 00	
R Reactor	R Reactor	Savannah River Plant, Aiken, SC	Du Pont	Heavy water	0.0	53 00	64 00	

2. PROCESS DEVELOPMENT

Hanford 305 Test Reactor	HTR	Richland, WA	Du Pont	Graphite	0.0	44 00	76 00	Negligible power.
Lattice Test Reactor	LTR	Savannah River Plant, Aiken, SC	Du Pont	Heavy water	1.0	67 00	79 00	
Process Development Pile	PDP	Savannah River Plant, Aiken, SC	Du Pont	Heavy water	1.0	53 00	79 00	
SR 305-M Test Pile	Test Pile	Savannah River Plant, Aiken, SC	Du Pont	Graphite	1.0	53 00	83 00	SR 305-M Test Pile was used to measure the reactivity effects of components (fuel tubes, target tubes, control rods, etc.) prior to use in Savannah River (SR) reactors. In addition, the Test Pile was used to measure the neutron absorption of miscellaneous materials used at SR. The Test Pile has been dismantled.
Standard Pile/Subcritical Experimental Complex	SP/SE	Savannah River Laboratory, Aiken, SC	Du Pont	Graphite	2.0	53 00	79 00	The SP–an enriched uranium-fueled, graphite-moderated, water-cooled reactor–supplied neutrons for reactor-component-reactivity testing in the SE, which was a graphite chamber on top of the SP. Authorized power ranged from 2 to 10 kW(t).

PART III MILITARY REACTORS

1. DEFENSE POWER-REACTOR APPLICATIONS

A. Remote Installations

Reactors in the Army Power Program are designated to reflect mobility characteristics, power range, development sequence, and field sequence. The first capital letter indicates mobility characteristics: S (stationary operation), not designed for subsequent relocation; P (portable), semimobile, stationary operation, capable of being dismantled and reassembled for use in successive locations; and M (mobile), capable of being moved intact, or virtually intact, for use in successive locations. The second capital letter indicates the power range as measured by design capacity for continuous operation: L (low), 100 to 1000 kW(e); M (medium), 1000 to 10,000 kW(e); and H (high), 10,000 kW(e) or more. Arabic numerals indicate order in which plants having the same mobility and power characteristics are initiated. If not followed by an additional letter, the designation indicates a prototype or pilot plant. The last capital letter (when present) indicates the alphabetical order in which field plants of a specific type are initiated.

Name (all owned by DOE)	Designation	Location	Principal nuclear contractor. Reactor type	Power capacity net kW(e)	Authorized power kW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Comment
Portable Medium Power Plant, No. 1	PM-1	Sundance, WY	Martin. Pressurized water	1,000.0	9,370.0	62 00	68 00	

A. Remote Installations (Continued)

Name (all owned by DOE)	Designation	Location	Principal nuclear contractor. Reactor type	Power capacity net kW(e)	Authorized power kW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Comment
Portable Medium Power Plant, No. 2A	PM-2A	Camp Century, Greenland	Alco. Pressurized water	1,560.0	10,000.0	60 00	63 00	The PM-2A was shut down 7-9-63 and dismantled during 4-64 to 6-64. The reactor vessel was then used by INEL for NDT (nil ductility transition temperature) investigations of materials that had been subjected to long-term irradiation. Defects were sequentially introduced into the vessel wall during a series of tests involving pressure and temperature conditions which exceeded the range permitted in operating nuclear power plants. The final test on 11-18-66 resulted in a brittle fracture under conditions even more severe than those which had been previously predicted to cause failure. The test program confirmed laboratory data on the adequacy of reactor-operating limitations to prevent brittle fracture of a pressure vessel.
Portable Medium Power Plant, No. 3A	PM-3A	McMurdo Sound, Antarctica	Martin. Pressurized water	1,500.0	9,510.0	62 00	73 00	
STURGIS Floating Nuclear Power Plant	MH-1A		Martin. Pressurized water	10,000.0	45,000.0	67 00	76 00	The MH-1A was installed in the STURGIS (formerly the Liberty Ship CHARLES H. CUGLE) at Mobile, AL. Acceptance testing was performed at Fort Belvoir, VA, 4-67 to 6-27-67, when the Army accepted the plant from the contractor. In late 7-68 the plant was deployed to Gatun Lake, Panama Canal Zone, and began producing power to the Panama Canal power grid on 10-5-68. The MH-1A is no longer available for service.
Stationary Medium Power Plant No. 1	SM-1	Fort Belvoir,	Alco. Pressurized water	1,855.0	10,000.0	57 00	73 00	
Stationary Medium Power Plant No. 1A	SM-1A	Fort Greely, AK	Alco. Pressurized water	1,650.0	20,200.0	62 00	72 00	The Army made the determination to shut down the SM-1A because the plant's demonstration and R&D missions had been successfully completed and because of the ready availability of cheaper conventional power at the site.

B. Propulsion (Naval)

SSN is Submarine (Nuclear Propulsion).
SSBN is Fleet Ballistic Missile Submarine (Nuclear Propulsion)

Name (all owned by U.S. Navy)	Designation	Shipbuilder	Start-up	Shut-down	Comments
NAUTILUS	SSN571	Electric boat (Groton)	54 00	80 00	
SEAWOLF PWR	SSN575	Electric boat (Groton)	60 00	86 00	
SEAWOLF Sodium Reactor	SSN575	Electric boat (Groton)	57 00	59 00	The SEAWOLF, originally commissioned with a sodium-cooled reactor in 3-57, was recommissioned with a pressurized-water reactor on 9-30-60.
SKATE	SSN578	Electric Boat (Groton)	57 00	85 00	
SWORDFISH	SSN579	Portsmouth	58 00	87 00	
SARGO	SSN583	Mare Island	58 00	86 00	
SEADRAGON	SSN584	Portsmouth	59 00	83 00	
SKIPJACK	SSN585	Electric Boat (Groton)	58 00	89 00	
TRITON (2 reactors)	SSN586	Electric Boat (Groton)	59 00	68 00	
HALIBUT	SSN587	Mare Island	59 00	76 00	
SCAMP*	SSN588	Mare Island	61 00	87 00	
SCORPION	SSN589	Electric Boat (Groton)	60 00	68 00	The SCORPION was lost in the Atlantic 5-21-68.
SCULPIN	SSN590	Ingalls	61 00	89 00	
SHARK	SSN591	Newport News	60 00	89 00	
SNOOK*	SSN592	Ingalls	61 00	86 00	
THRESHER	SSN593	Portsmouth	61 00	63 00	The THRESHER was lost in the Atlantic 4-10-63.
PLUNGER	SSN595	Mare Island	62 00	89 00	
TULLIBEE	SSN597	Electric Boat (Groton)	60 00	87 00	
GEORGE WASHINGTON*	SSN598	Electric Boat (Groton)	59 00	84 00	
PATRICK HENRY*	SSN599	Electric Boat (Groton)	60 00	83 00	
THEODORE ROOSEVELT*	SSBN600	Mare Island	60 00	81 00	
ROBERT E. LEE*	SSN601	Newport News	60 00	83 00	
ABRAHAM LINCOLN	SSBN602	Electric Boat (Groton)	60 00	81 00	
POLLACK	SSN603	NYSC	63 00	88 00	
JACK	SSN605	Portsmouth	65 00	89 00	
DACE*	SSN607	Ingalls	63 00	88 00	
ETHAN ALLEN	SSN608	Electric Boat (Groton)	61 00	82 00	
THOMAS A. EDISON	SSN610	Electric Boat (Groton)	61 00	83 00	
THOMAS JEFFERSON*	SSN618	Newport News	62 00	84 00	
ANDREW JACKSON	SSBN619	Mare Island	63 00	88 00	
JOHN ADAMS	SSBN620	Portsmouth	64 00	88 00	
NATHAN HALE	SSBN623	Electric Boat (Groton)	63 00	86 00	
NATHANAEL GREENE	SSBN636	Portsmouth	64 00	86 00	

*The defueled reactor compartment has been removed and disposed of at a government burial ground.

2. DEVELOPMENTAL POWER

A. Electric-Power Experiments and Prototypes

Name (Owner)	Designation	Location	Principal nuclear contractor. Reactor type	Power capacity net kW(e)	Authorized power kW(t)	Initial criticality (yr mo)	Shutdown (yr mo)	Comment
Gas Cooled Reactor Experiment (DOE)	GCRE	INEL Site, ID	AGN. Gas cooled, light water moderated	0.0	2,200.0	60 00	62 00	No electricity was produced.

A. Electric-Power Experiments and Prototypes (Continued)

Name (Owner)	Designation	Location	Principal nuclear contractor. Reactor type	Power capacity net kW(e)	Authorized power kW(t)	Initial criticality (yr mo)	Shutdown (yr mo)	Comment
Mobile Lower Power Plant No. 1 (DOE)	ML-1	INEL Site, ID	AGN. Gas cooled, light water moderated	300.0	3,300.0	61 00	65 00	
Stationary Low Power Plant No. 1 (DOE)	SL-1	INEL Site, ID	ANL. Boiling water	300.0	2,200.0	58 00	61 00	

B. Propulsion Experiments and Prototypes

Aircraft Reactor Experiment (DOE)	ARE	Oak Ridge, TN	ORNL. Molten salt	0.0	1,500.0	54 00	54 00	
Experimental Propulsion Test Reactor (DOE)	TORY IIA	NTS, NV	LLNL. Air cooled	0.0	150,000.0	60 00	61 00	
Experimental Propulsion Test Reactor (DOE)	TORY IIC	NTS, NV	LLNL. Air cooled	0.0	600,000.0	64 00	64 00	The TORY IIC was successfully tested at full design power during 5-64. Subsequent to cancellation of the Pluto program 7-1-64, the reactor was placed in the Pluto disassembly building at NST for storage. In 1974 the reactor was transferred to the NERVA disassembly area for disassembly.
Heat Transfer Reactor Experiment No. 1 (DOE)	HTRE-1	INEL Site, ID	ANPD. Air cooled	0.0	20,000.0	56 00	57 00	
Heat Transfer Reactor Experiment No. 2 (DOE)	HTRE-2	INEL Site, ID	ANPD. Air cooled	0.0	14,000.0	57 00	61 00	
Heat Transfer Reactor Experiment No. 3 (DOE)	HTRE-3	INEL Site, ID	ANPD. Air cooled	0.0	32,000.0	58 00	61 00	
Submarine Intermediate Reactor Mark A (DOE)	SIG	West Milton, NY	GE. Sodium	0.0	0.0	55 00	57 00	Authorized power not available.
Submarine Thermal Reactor Facility	S1W	INEL Site, ID	West. Pressurized water	0.0	0.0	53 00	89 10	Authorized power not available.

3. TEST AND RESEARCH

A. Test

Aerospace Systems Test Reactor (USAF)	ASTR	Fort Worth, TX	Convair. LWR	0.0	10,000.0	54 00	71 00	Defueled in 1971; decommissioning began in 1973 and was completed in 1974.
Ground Test Reactor (USAF)	GTR	Fort Worth, TX	Convair. Pool	0.0	10,000.0	53 00	73 00	Decommissioning began in 1973 and was completed in 1974.

Nuclear Engineering Test Reactor (USAF)	NETR	Dayton, OH	Maxon–AC. Tank	0.0	10,000.0	65 00	70 00	

B. Research

Army Materials Research Reactor (USA). Regulated by NRC	AMRR	Watertown, MA	BAC. Pool	0.0	5,000.0	60 00	70 00	Army Materials and Mechanics Research Center.
Diamond Ordnance Radiation Facility (USA)	DORF	Forest Glen, MD	GA. TRIGA-Mk F	0.0	250.0	61 00	77 00	Harry Diamond Laboratories.
Naval Research Reactor (USN). Regulated by NRC	NRR	Washington, D.C.	NRL. Pool	0.0	1,000.0	56 00	70 00	
Nuclear Effects Reactor (DOE)	Super KUKLA	NTS, NV	LLNL. Prompt burst	0.0	0.0	64 00	79 00	Standby fuel in storage at ORNL.
Thermal Test Reactor No. 1 (DOE)	TTR-1	Schenectady, NY	KAPL. Graphite	0.0	10.0	51 00	83 00	
Walter Reed Research Reactor (USA). Regulated by NRC	WRRR	Washington, D.C.	AI. Homogeneous	0.0	50.0	62 00	70 00	Walter Reed Army Institute of Research.

1. POWER REACTORS

PART IV EXPORT REACTORS

A. Central-Station Electric Power Plants

Reactor name. Owner	Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Author-ized power kW(t)	Initial criti-cality (yr mo)	Shut-down (yr mo)	Comment
Germany, Kahl Nuclear Power Station. Rhine-Westphalia Power Co., RWE	Kahl-am-Main	XR-031 09/30/59	GE. Boiling water	15.6	60.0	0.0	61 00	85 00	
Germany, Kerndraftwerk-RWE-Bayernwerk, KRBI.	Gundremmingen (near Gunzburg)	XR-052 05/28/64	GE. Boiling water	237.0	801.0	0.0	67 00	80 00	
Italy, Garigliano Nuclear Power Station. Project ENEL of SENN	Punta Fiume (on Garigliano River)	XR-043 08/16/61	GE. Boiling water	150.0	506.0	0.0	64 00	78 00	
Japan, Japan Power Demonstration Reactor. JAERI	Tokai-Mura, Ibaraki Pref.	XR-045 03/16/62	GE. Boiling water	12.0	90.0	0.0	63 00	83 00	

B. Propulsion

Great Britain, S5W for HMS DREADNOUGHT.			West. Pressurized water	0.0	0.0	0.0	62 00	00 00	Westinghouse was the designer of the reactor. Designation: S5W. No power levels available. As of 2-90 the reactor has been defueled and is not in operational condition.

2. TEST, RESEARCH, and TEACHING

A. General Irradiation Test

(No reactors in this category.)

B. General Research

Reactor name. Owner	Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Author-ized power kW(t)	Initial criti-cality (yr mo)	Shut-down	Comment
Belgium, BR-3, Mol. AMITAS	Mol	XR-024 11/06/58	Pressurized water	10.5	0.0	0.0			The reactor contains some fuel and is still under IAEA jurisdiction.
Denmark, DR-2. Risö National Laboratory	Risö	XR-006 04/04/57	FW. Tank	0.0	0.0	5000.0	58 00	75 00	
Germany, FRG-1. GKSS-Forschungszentrum Geesthacht G.m.b.H.	Geesthacht	XR-008 06/10/57	B&W. Research Reactor	0.0	0.0	5000.0	58 10	n.d.	
Italy. Center for Military Application of Nuclear Energy	Near Pisa	XR-036 12/17/59	B&W. Pool	0.0	0.0	0.0	63 00	80 00	Power: Pulsing.
Italy. European Community Commission	Ispra	XR-007 05/17/57	AC. Heavy water, tank	0.0	0.0	5000.0	59 00	89 00	
Italy. Fiat TTG	Saluggia	XR-016 12/06/57	AMF. Pool	0.0	0.0	7000.0	59 00	73 00	
Italy. National Committee for Nuclear Energy	Casaccia	XR-051 04/20/64	AMF. Pool	0.0	0.0	0.0	71 00	79 00	Negligible power.
Japan. Japan Atomic Energy Research Institute	Tokai-Mura, Ibaraki Pref.	XR-001 11/02/56	AI. L-54	0.0	0.0	50.0	57 00	69 00	
Vietnam. Vietnam Institute of Nuclear Research	Dalat	XR-032 10/10/59	GA. TRIGA-Mk II	0.0	0.0	250.0	63 00	73 00	
West Berlin, City of. Institute for Nuclear Research	West Berlin	XR-012 09/07/57	AI. L-54	0.0	0.0	50.0	58 00	70 00	

C. University Research and Teaching

Germany. Association for Radiation Research	Munich	XR-075 01/14/71	GA. TRIGA-Mk III	0.0	0.0	1000.0	72 00	82 00	This reactor was sold through Gulf Oil licensee, Gutehoffnungshuette Sterkrade A.E.
Germany. Brown Boveri/Krupp	Jülich	XR-062 07/28/66	AI. L-77A	0.0	0.0	0.0	64 00	77 00	This L-77 reactor was operated in the commerical exhibit of the 1958 International Conference in Geneva and in the USAEC Atoms for Peace Exhibits in Beirut, Lebanon, 10-61; in Athens, Greece, 5-62; and in Bangkok, Thailand, 11-62.
Germany. Universities of Frankfurt and Darmstadt	Frankfurt	XR-009 05/01/57	AI. L-54	0.0	0.0	50.0	58 00	68 00	
Italy. University of Milan	Milan	XR-022 08/13/58	AI. L-54	0.0	0.0	50.0	59 00	86 00	

Switzerland. University of Geneva	Geneva		AGN. AGN-201-111	0.0	0.0	0.0	58 00	87 00	Negligible power. The AGN-201-111 was operated first in the USAEC Atoms for Peace Exhibit in Rome, Italy, 7-58 and later in the commercial exhibit of the 1958 International Conference in Geneva prior to transfer to the University of Geneva.
United Kingdom. Queen Mary College, London University	London	XR-049 02/13/64	AS Inc. UTR-B	0.0	0.0	100.0	65 00	82 00	

PART V CRITICAL ASSEMBLIES

1. CIVILIAN

Facility	Designation	Location	Equipment: No. of cells	Equipment: No. of control panels/ room	Abbreviation	Initial criticality (yr mo)	Shut-down (yr mo)	Subject of experiment or study. Comment
Argonne National Laboratory (DOE)	ZPR-6	Argonne, IL	2	2	ANL	63 00	82 00	Basic fast reactor studies and mock-up for LMFBR.
Argonne National Laboratory (DOE)	ZPR-9	Argonne, IL	2	2	ANL	67 00	82 00	Basic fast reactor studies and mock-up for LMFBR. Zero-power experiments of historical interest previously conducted in ANL facility cells include the NAUTILUS core design (ZPR-1), the Savannah River reactor design (ZPR-2), and a series of fast-neutron studies (ZPR-4) and interactions between two basic systems (ZPR-5). The following experiments were performed in the ZPR-7 facility: thorium, uranium, deuterium criticals (THUD), and a series of flux-trap criticals for the Argonne High Flux Research Reactor.
Bettis Atomic Power Laboratory (DOE)	LWBCC	Pittsburgh, PA	3	3	Bettis	63 00	80 00	LWB physics.
Critical Facility-10, Lynchburg Research Center (NRC)	SSRF	Lynchburg, VA	2	1	CX-10	77 00	88 02	Close storage of spent reactor fuel. License terminated 2-88.
Los Alamos National Laboratory (DOE)	Parka	Los Alamos, NM	3	3	LANL, Kiva III	63 00	85 00	Cold critical for instrumentation testing. Defueled.
Los Alamos National Laboratory (DOE)	Venus	Los Alamos, NM	1	1	LANL, Kiva I	76 00	88 00	Vertical table assembly machine.
United Nuclear Corporation, Development Division (NRC)	PTF	Pawling, NY	4	3	UNC	67 00	72 00	Proff test facility. Material license (SNM-871) terminated 7-14-75.

2. MILITARY

Bettis Atomic Power Laboratory (DOE)	HTTF	Pittsburgh, PA	0	0	Bettis	59 00	84 00	Surface-ship physics.
Bettis Atomic Power Laboratory (DOE)	SS-CF	Pittsburgh, PA	0	0	Bettis	57 00	76 00	Surface-ship physics.
Knolls Atomic Power Laboratory (DOE)	FPR	Schenectady, NY	0	0	KAPL	56 00	75 00	Flexible critical experiments.
Knolls Atomic Power Laboratory (DOE)	PTR	Schenectady, NY	0	0	KAPL	58 00	76 00	High-temperature high-pressure physics and mock-up.

REACTOR INDEX

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