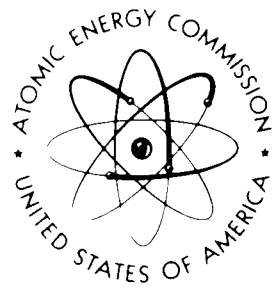
TID-8200(22nd Rev.)
REACTOR TECHNOLOGY

MASTER

NUCLEAR REACTORS BUILT, BEING BUILT, or PLANNED

in the UNITED STATES as of June 30, 1970

Prepared by Office of the
Assistant General Manager for Reactors



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U. S. Department of Commerce
Springfield, Virginia 22151

Requests should include the report number [TID-8200(22nd Rev.)].

NOTICE

Printed in the United States of America

USAEC Division of Technical Information Extension, Oak Ridge, Tennessee

NUCLEAR REACTORS BUILT, BEING BUILT, or PLANNED

CIVILIAN REACTORS

PRODUCTION REACTORS

MILITARY REACTORS

REACTORS FOR EXPORT

CRITICAL-ASSEMBLY FACILITIES

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FOREWORD

This compilation contains unclassified information about facilities built, being built, or planned in the United States for domestic use or export as of June 30, 1970, which are capable of sustaining a nuclear chain reaction. Information is presented in five parts, each of which is categorized by primary function or purpose. The major parts, namely, civilian, military, production, and export, as well as such categories as power and propulsion, are self-explanatory. Various classes of reactors within these categories are defined as follows

CENTRAL-STATION NUCLEAR POWER PLANT A facility designed and constructed for operation on a utility system. The primary purpose of some of these plants is to demonstrate the economic and technical potential of future plants of the same general type, others, particularly those of the light-water type, are expected to be economically competitive with conventionally fueled plants in the geographic area in which they are located (Part I, Sec. 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, Sec 1B)

COMMERCIAL NUCLEAR POWER PLANT A nuclear facility constructed and operated under a license issued under Section 103 of the Atomic Energy Act of 1954 capable of producing steam for the generation of electricity, propulsion, and space- or process-heat applications upon which the AEC has made a finding of practical value within the meaning of Section 102 of the Atomic Energy Act. (No reactors presently in the category)

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 out various aspects of reactor technology including fuel and other components Power-conversion equipment may or may not be included as part of the facility. (Part I, Sec. 2A)

GENERAL IRRADIATION TEST REACTOR A reactor having (1) a thermal power level exceeding 10,000 kW, (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, Sec. 3A, and Part IV, Sec. 2A)

HIGH-POWER RESEARCH AND TEST REACTOR A reactor having a relatively high thermal power level (5000 kW or more) but not classed as a general irradiation test reactor (Part I, Sec. 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, Sec 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 less than 5000 kW. It may include facilities for testing reactor materials. (Part I, Sec 3D, Part III, Sec 3B, and Part IV, Sec. 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, Sec 3E, and Part IV, Sec. 2C)

SPECIAL TEST REACTOR A reactor designed for special testing purposes (Part III, Sec 3A)

CRITICAL FACILITY A reactor capable of sustaining a nuclear chain reaction operating at extremely low power (a few watts) and designed to determine a critical mass, neutron-flux distribution, and other characteristics of a flexible arrangement of nuclear fuel, construction materials, coolant, and other reactor components Fluid critical facilities are used to explore the critical masses of various concentrations of solutions in differing geometries. Metal critical assemblies are used to investigate the variations in heterogeneous cores. The tabulation of these facilities in Part V (pp 29-32) excludes those that have been operated and subsequently dismantled.

The abbreviated listings in the principal nuclear contractor column refer to the technical organization assigned primary responsibility for design and/or fabrication of the reactor system The spelled out forms for those abbreviations as well as those for designers, shipbuilders, and facility operators, are given in the table on page

Startup dates refer to the year of first criticality Estimated startup dates based on the best available information are included for projects not yet in service The dates for non Commission projects are estimates announced by the sponsoring organizations

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

1 Federal Government reactors—when criticality is achieved
2 Non Federal Government reactors in the United States—when criticality is achieved or in the case of relatively low power systems an operating license is issued by the Commission
3 Reactors for foreign locations—when criticality is achieved

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

1 Federal Government reactors—when ground is broken components are ordered or construction contract is awarded
2 Non Federal Government reactors in the United States—when the construction permit is issued by the Commission
3 Reactors for foreign locations—when an application for an export license is received by the Commission or when reliable information is received relating to the fabrication of reactor components

Reactors are listed as being *planned* under the following circumstances

1 Federal Government reactors—when publicly announced as a project planned for construction by the agency involved or the project is otherwise appropriately authorized
2 Non Federal Government reactors in the United States—when a public announcement that includes principal contractor and reactor type is made by the sponsoring organization or an application for a construction permit is received by the Commission
3 Reactors for foreign locations—when public announcement that includes principal contractor and reactor type is made or when the Commission 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 listed as *shut down or dismantled* when the owner announces or verifies a decision to permanently shut down a facility and does not intend to restart the reactor A reactor shut down owing to technical problems, extensive modifications, or refueling continues to be listed as *operable*

The Statistical Summary on page 5 excludes critical facilities All other categories are summarized Shutdown and dismantled reactors in these categories are included since such facilities have made significant contributions to reactor technology

STATISTICAL SUMMARY

	Operable	Being built	Planned	Shut down or dismantled
I. CIVILIAN REACTORS				
1. Power Reactors				
A. Central-Station Electric Power	15	54	32	6
B. Dual-Purpose Plants	1		2	
C. Propulsion (Maritime)	1			
2. Experimental Power-Reactor Systems				
A. Electric-Power Systems	3			21
B. Auxiliary Power (SNAP)	1			8
C. Space Propulsion (Rover)		2	2	18
3. Test, Research, and University Reactors				
A. General Irradiation Test	4		1	2
B. High-Power Research and Test	11			2
C. Safety Research and Test	3	2		7
D. General Research	36			21
E. University Research and Teaching	53	4	5	1
II. PRODUCTION REACTORS				
1. Materials Production	4			9
2. Process Development	5			
III. MILITARY REACTORS				
1 Defense Power-Reactor Applications				
A. Remote Installations	4			2
B. Propulsion (Naval)	104	25	5	5
2. Developmental Power				
A. Electric-Power Experiments and Prototypes				3
B. Propulsion Experiments and Prototypes	7			7
3. Test and Research				
A. Test	4			1
B. Research	7			3
IV. REACTORS FOR EXPORT				
1. Power Reactors				
A. Central-Station Electric Power	10	8	5	
B. Propulsion	1			
2. Test, Research, and Teaching				
A. General Irradiation Test	4			
B General Research	26	2		1
C University Research and Teaching	25		2	

LIST OF CONTRACTORS, DESIGNERS, SHIPBUILDERS, AND FACILITY OPERATORS FOR WHICH ABBREVIATIONS APPEAR IN TABLES

AC	Allis-Chalmers Mfg Co
ACF	ACF Industries, Inc (reactor activities absorbed by AC)
AG	Aerojet-General Corporation
AGN	Aerojet-General Nucleonics, formerly a subsidiary and now a Division of Aerojet-General Corporation
AI	Atomics International, a Division of North American Rockwell Corp
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)
ARSS	American Radiator & Standard Sanitary Corp
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
BNL	Brookhaven National Laboratory, operated by Associated Universities, Inc
BNW	Battelle Northwest, a Division of Battelle Memorial Institute
B&R	Burns & Roe, Inc
B&W	Babcock & Wilcox Co
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
DOD	Department of Defense
DOW	The Dow Chemical Co , Rocky Flats Division
DUN	Douglas-United Nuclear, Inc
du Pont	E I du Pont de Nemours & Company, Inc
Ebasco	Ebasco Services, Inc
GNEC	General Nuclear Engineering Corp (became a division of Combustion Engineering, Inc , in 1964)
GSA	General Services Administration
HA	Hittman Associates
HKF	H K Ferguson Co
Hughes	Hughes Aircraft Co
IC	Internuclear Co
INC	Idaho Nuclear Corporation
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
LASL	Los Alamos Scientific Laboratory, operated by the University of California
Lockheed	Lockheed Aircraft Corp
Martin	Martin Marietta Corp
Maxon	Maxon Construction Co
Met Lab	Metallurgical Laboratory of the Manhattan Engineer District
MINS	Mare Island Naval Shipyard
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
NRTS	National Reactor Testing Station
NSA	Nuclear Systems Associates
NYSC	New York Shipbuilding Corp
ORNL	Oak Ridge National Laboratory, operated by Union Carbide Corporation
Portsmouth	Portsmouth Naval Shipyard
PPC	Phillips Petroleum Co
PRDC	Power Reactor Development Company

Electric Boat	Electric Boat Division, General Dynamics Corp
FAST, Inc.	First Atomic Ship Transport, Inc , a subsidiary of American Export Isbrandtsen Lines
Fluor	The Fluor Corporation, Ltd
FW	Foster Wheeler Corp
GD (Quincy)	Quincy Division, General Dynamics Corp
GGA	Gulf General Atomic Incorporated, a subsidiary of Gulf Oil Corporation (formerly General Atomic Division, General Dynamics Corp)
GE	General Electric Company
GENMPO	General Electric Nuclear Materials and Propulsion Operation
GM	General Motors Corp
P&W	Pratt & Whitney Aircraft Division, United Aircraft Corp.
Sandia	Sandia Laboratories, operated by Sandia Corp , a subsidiary of Western Electric Co.
San Francisco Bay	San Francisco Bay Naval Shipyard
TVA	Tennessee Valley Authority
UCLRL	University of California Lawrence Radiation Laboratory
UNC	United Nuclear Corporation, Development Division
WADCO	Westinghouse Atomic Development Co., a subsidiary of Westinghouse Electric Corporation
West	Westinghouse Electric Corporation

1. POWER REACTORS

A. Central-Station Electric Power

PART I CIVILIAN REACTORS (DOMESTIC)

Name and/or owner	Location	Principal nuclear contractor	Type	Power[1] Plant, net kW(e)	Power[1] Reactor, kW(t)	Start-up
OPERABLE						
Shippingport Atomic Power Station (AEC and Duquesne Light Co.)[2]	Shippingport, Pa	West	Pressurized water	90,000	505,000	1957
Dresden Nuclear Power Station, Unit 1 (Commonwealth Edison Co.)[3]	Morris, Ill.	GE	Boiling water	200,000	700,000	1959
Yankee Nuclear Power Station (Yankee Atomic Electric Co)[3,4]	Rowe, Mass	West.	Pressurized water	175,000	600,000	1960
Big Rock Point Nuclear Plant (Consumers Power Co.)[3,4]	Big Rock Point, Mich	GE	Boiling water	70,300	240,000	1962
Indian Point Station, Unit 1 (Consolidated Edison Co of New York, Inc.)[3,5]	Indian Point, N. Y.	B&W	Pressurized water	265,000	615,000	1962
Enrico Fermi Atomic Power Plant (Power Reactor Development Co.)[3,4]	Lagoona Beach, Mich.	PRDC	Sodium cooled, fast	60,900	200,000	1963
Humboldt Bay Power Plant, Unit 3 (Pacific Gas & Electric Co)[3]	Eureka, Calif	GE	Boiling water	68,500	240,000	1963
Peach Bottom Atomic Power Station, Unit 1 (Philadelphia Electric Co.)[3,4]	Peach Bottom, Pa.	GGA	Gas cooled, graphite moderated	40,000	115,000	1966
San Onofre Nuclear Generating Station, Unit 1 (Southern California Edison and San Diego Gas & Electric Co.)[3,4]	San Clemente, Calif.	West	Pressurized water	430,000	1,347,000	1967

A. Central-Station Electric Power (Continued)

Name and/or owner	Location	Principal nuclear contractor	Type	Power[1]		Start-up	Shut-down
				Plant, net kW(e)	Reactor, kW(t)		
OPERABLE (Continued)							
La Crosse Boiling Water Reactor (AEC and Dairyland Power Cooperative)[3,4]	Genoa, Wis	AC	Boiling water	50,000	165,000	1967	
Haddam Neck Plant (Connecticut Yankee Atomic Power Co)[3,4]	Haddam Neck, Conn	West	Pressurized water	575,000	1,825,000	1967	
Oyster Creek Nuclear Power Plant, Unit 1 (Jersey Central Power & Light Co)[3]	Toms River, N J	GE	Boiling water	530,000	1,600,000	1969	
Nine Mile Point Nuclear Station (Niagara Mohawk Power Corp)[3]	Scriba, N Y	GE	Boiling water	500,000	1,538,000	1969	
Robert Emmett Ginna Nuclear Power Plant, Unit 1 (Rochester Gas & Electric Co)[3]	Ontario, N Y	West	Pressurized water	420,000	1,300,000	1969	
Dresden Nuclear Power Station, Unit 2 (Commonwealth Edison Co)[3]	Morris, Ill	GE	Boiling water	809,000	2,527,000	1970	
BEING BUILT							
Millstone Nuclear Power Station, Unit 1 (Connecticut Light & Power Co , Hartford Electric Light Co , and Western Massachusetts Electric Co)[3]	Waterford, Conn	GE	Boiling water	652,100	2,011,000	1970	
Palisades Nuclear Power Station, Unit 1 (Consumers Power Co of Michigan)[3]	South Haven, Mich	Comb	Pressurized water	700,000	2,212,000	1970	
Dresden Nuclear Power Station, Unit 3 (Commonwealth Edison Co)[3]	Morris, Ill	GE	Boiling water	809,000	2,527,000	1970	
H B Robinson S E Plant, Unit 2 (Carolina Power & Light Co)[3]	Hartsville, S C	West	Pressurized water	700,000	2,200,000	1970	
Monticello Nuclear Generating Plant (Northern States Power Co)[3]	Monticello, Minn	GE	Boiling water	545,000	1,670,000	1970	
Point Beach Nuclear Plant, Unit 1 (Wisconsin Electric Power Co and Wisconsin Michigan Power Co)[3]	Two Creeks, Wis	West	Pressurized water	497,000	1,518,000	1970	
Oconee Nuclear Station, Unit 1 (Duke Power Co)[3]	Seneca, S C	B&W	Pressurized water	841,120	2,452,000	1970	
Indian Point Station, Unit 2 (Consolidated Edison Co of New York, Inc)[3]	Indian Point, N Y	West	Pressurized water	872,890	2,758,000	1971	
Browns Ferry Nuclear Power Plant, Unit 1 (TVA)[3]	Decatur, Ala	GE	Boiling water	1,064,500	3,293,000	1971	
Peach Bottom Atomic Power Station, Unit 2 (Philadelphia Electric Co , Public Service Electric & Gas Co , Atlantic City Electric Co , Delmarva Power & Light Co)[3]	Peach Bottom, Pa	GE	Boiling water	1,065,000	3,294,000	1971	
Quad Cities Station, Unit 1 (Commonwealth Edison Co and Iowa–Illinois Gas and Electric Co)[3]	Cordova, Ill	GE	Boiling water	809,000	2,511,000	1971	
Surry Power Station, Unit 1 (Virginia Electric & Power Co)[3]	Gravel Neck, Va	West	Pressurized water	780,000	2,441,000	1971	
Zion Station, Unit 1 (Commonwealth Edison Co)[3]	Zion, Ill	West	Pressurized water	1,050,000	3,250,000	1971	
Turkey Point Station, Unit 3 (Florida Power & Light Co)[3]	Turkey Point, Fla	West	Pressurized water	651,500	2,097,000	1971	
Vermont Yankee Generating Station (Vermont Yankee Nuclear Power Corp)[3]	Vernon, Vt	GE	Boiling water	513,900	1,593,000	1971	
Quad Cities Station, Unit 2 (Commonwealth Edison Co and Iowa–Illinois Gas & Electric Co)[3]	Cordova, Ill	GE	Boiling water	809,000	2,511,000	1971	
Pilgrim Station (Boston Edison Co)[3]	Plymouth, Mass	GE	Boiling water	654,000	1,998,000	1971	
[redacted]t Beach Nuclear Plant, Unit 2 (Wisconsin Electric Power Co and Wisconsin Michigan Power Co)[3]	Two Creeks, Wis	West	Pressurized water	497,000	1,518,000	1971	

St. Vrain Nuclear Generating Station (Public Service Co. of Colorado)[3,4]	Platteville, Colo.	GGA	Gas cooled, graphite moderated	330,000	841,700	197
Cooper Nuclear Station (Nebrasak Public Power District)[3]	Brownville, Nebr.	GE	Boiling water	778,000	2,381,000	1971
Oconee Nuclear Station, Unit 2 (Duke Power Co.)[3]	Seneca, S. C.	B&W	Pressurized water	886,000	2,568,000	1971
Three Mile Island Station, Unit 1 (Metropolitan Edison Co.)[3]	Middletown, Pa.	B&W	Pressurized water	810,000	2,452,000	1971
Fort Calhoun Station, Unit 1 (Omaha Public Power District)[3]	Fort Calhoun, Nebr.	Comb.	Pressurized water	457,400	1,420,000	1972
Surry Power Station, Unit 2 (Virginia Electric & Power Co.)[3]	Gravel Neck, Va.	West.	Pressurized water	780,000	2,441,000	1972
Salem Nuclear Generating Station, Unit 1 (Public Service Electric & Gas Co., Philadelphia Electric Co., Atlantic City Electric Co., Delmarva Power & Light Co.)[3]	Salem, N. J	West	Pressurized water	1,050,000	3,250,000	1972
Turkey Point Station, Unit 4 (Florida Power & Light Co.)[3]	Turkey Point, Fla.	West.	Pressurized water	651,500	2,097,000	1972
Diablo Canyon Nuclear Power Plant, Unit 1 (Pacific Gas & Electric Co.)[3]	Diablo Canyon, Calif.	West.	Pressurized water	1,060,000	3,250,000	1972
Prairie Island Nuclear Generating Plant, Unit 1 (Northern States Power Co.)[3]	Red Wing, Minn.	West.	Pressurized water	530,000	1,650,000	1972
Maine Yankee Atomic Power Plant (Maine Yankee Atomic Power Corp.)[3]	Wiscasset, Maine	Comb.	Pressurized water	790,000	2,440,000	1972
Browns Ferry Nuclear Power Plant, Unit 2 (Tennessee Valley Authority)[3]	Decatur, Ala.	GE	Boiling water	1,064,500	3,293,000	1972
Kewaunee Nuclear Power Plant (Wisconsin Power & Light Co., Wisconsin Public Service Co., Madison Gas & Electric Co.)[3]	Carlton, Wis.	West.	Pressurized water	527,000	1,650,000	1972
Crystal River Plant, Unit 3 (Florida Power Corp.)[3]	Red Level, Fla.	B&W	Pressurized water	858,000	2,452,000	1972
Peach Bottom Atomic Power Station, Unit 3 (Philadelphia Electric Co., Public Service Electric & Gas Co., Atlantic City Electric Company, Delmarva Power & Light Co.)[3]	Peach Bottom, Pa.	GE	Boiling water	1,065,000	3,294,000	1972
Browns Ferry Nuclear Power Plant, Unit 3 (TVA)[3]	Decatur, Ala.	GE	Boiling water	1,064,500	3,293,000	1972
Rancho Seco Nuclear Generating Station, Unit 1 (Sacramento Municipal Utility District)[3]	Clay Station, Calif.	B&W	Pressurized water	800,000	2,452,000	1972
Calvert Cliffs Nuclear Power Plant, Unit 1 (Baltimore Gas & Electric Co.)[3]	Lusby, Md.	Comb.	Pressurized water	800,000	2,450,000	1972
Edwin I. Hatch Nuclear Plant, Unit 1 (Georgia Power Co.)[3]	Baxley, Ga	GE	Boiling water	786,000	2,436,000	1972
Donald C. Cook Nuclear Plant, Unit 1 (Indiana and Michigan Electric Co.)[3]	Bridgman, Mich.	West.	Pressurized water	1,054,000	3,250,000	1972
Oconee Nuclear Station, Unit 3 (Duke Power Co.)[3]	Seneca, S. C.	B&W	Pressurized water	886,000	2,568,000	1972
Beaver Valley Power Station, Unit 1 (Duquesne Light, Ohio Edison Co., and Pennsylvania Power Co.)[3]	Midland, Pa.	West.	Pressurized water	847,000	2,660,000	1972
Arkansas Nuclear One, Unit 1 (Arkansas Power & Light Co)[3]	London, Ark.	B&W	Pressurized water	850,000	2,452,000	1973
Donald C. Cook Nuclear Plant, Unit 2 (Indiana and Michigan Electric Co.)[3]	Bridgman, Mich.	West.	Pressurized water	1,060,000	3,250,000	1973
Calvert Cliffs Nuclear Power Plant, Unit 2 (Baltimore Gas & Electric Co.)[3]	Lusby, Md	Comb.	Pressurized water	800,000	2,450,000	1973
Zion Station, Unit 2 (Commonwealth Edison Co.)[3]	Zion, Ill.	West.	Pressurized water	1,050,000	3,250,000	1973
Indian Point Station, Unit 3 (Consolidated Edison Co. of New York, Inc.)[3]	Indian Point, N. Y.	West.	Pressurized water	965,000	3,025,000	1973
Salem Nuclear Generating Station, Unit 2 (Public Service Electric & Gas Co., Philadelphia Electric Co., Atlantic City Electric Co., Delmarva Power & Light Co.)[3]	Salem, N. J.	West.	Pressurized water	1,050,000	3,250,000	1973
Three Mile Island Nuclear Station, Unit 2 (Jersey Central Power & Light Co.)[3]	Middletown, Pa.	B&W	Pressurized water	810,000	2,452,000	1973

A. Central-Station Electric Power (Continued)

Name and/or owner	Location	Principal nuclear contractor	Type	Power[1] Plant Net kW(e)	Power[1] Reactor kW(t)	Start-up	Shut-down
BEING BUILT (Continued)							
Brunswick Steam Electric Plant, Unit 2 (Carolina Power & Light Co.)[3]	Southport, N. C.	GE	Boiling water	821,000	2,436,000	1973	
Sequoyah Nuclear Power Plant, Unit 1 (Tennessee Valley Authority)[3]	Daisy, Tenn.	West.	Pressurized water	1,124,000	3,423,000	1973	
Duane Arnold Energy Center, Unit 1 (Iowa Electric Light & Power Co., Central Iowa Power Cooperative and Corn Belt Power Cooperative)[3]	Palo, Iowa	GE	Boiling water	545,000	1,593,000	1973	
James A. FitzPatrick Nuclear Power Plant (Power Authority of the State of New York)[3]	Scriba, N. Y.	GE	Boiling water	821,000	2,436,000	1973	
Sequoyah Nuclear Power Plant, Unit 2 (Tennessee Valley Authority)[3]	Daisy, Tenn.	West.	Pressurized water	1,124,000	3,423,000	1974	
Prairie Island Nuclear Generating Plant, Unit 2 (Northern States Power Co)[3]	Red Wing, Minn.	West	Pressurized water	530,000	1,650,000	1974	
Brunswick Steam Electric Plant, Unit 1 (Carolina Power & Light Co.)[3]	Southport, N. C.	GE	Boiling water	821,000	2,436,000	1975	
PLANNED							
Hutchinson Island, Unit 1 (Florida Power & Light Co)[3]	Fort Pierce, Fla.	Comb.	Pressurized water	800,000	2,440,000	1973	
Millstone Nuclear Power Station, Unit 2 (Connecticut Light & Power Co., Hartford Electric Light Co. and Western Massachusetts Electric Co.)[3]	Waterford, Conn.	Comb	Pressurized water	828,000	2,560,000	1973	
North Anna Power Station, Unit 1 (Virginia Electric & Power Co.)[3]	Mineral, Va.	West.	Pressurized water	845,000	2,652,000	1973	
Diablo Canyon Nuclear Power Plant, Unit 2 (Pacific Gas & Electric Company)[3]	Diablo Canyon, Calif.	West.	Pressurized water	1,060,000	3,250,000	1973	
Enrico Fermi Atomic Power Plant, Unit 2 (Detroit Edison Company)[3]	Lagoona Beach, Mich.	GE	Boiling water	1,123,000	3,293,000	1973	
Trojan Nuclear Plant, Unit 1 (Portland General Electric Co., Eugene Water & Electric Board and Pacific Power & Light Co.)[3]	Rainier, Oreg.	West.	Pressurized water	1,106,000	3,423,000	1974	
Davis-Besse Nuclear Power Station (Toledo Edison Company and Cleveland Electric Illuminating Company)[3]	Oak Harbor, Ohio	B&W	Pressurized water	872,000	2,650,000	1974	
Joseph M. Farley Nuclear Plant (Alabama Power Company)[3]	Dothan, Ala	West.	Pressurized water	829,000	2,652,000	1974	
North Anna Power Station, Unit 2 (Virginia Electric & Power Co.)[3]	Mineral, Va.	West.	Pressurized water	845,000	2,652,000	1974	
Newbold Island Nuclear Generating Station, Unit 1 (Public Service Electric & Gas Co.)[3]	Newbold Island, N. J.	GE	Boiling water	1,088,000	3,293,000	1974	
Limerick Generating Station, Unit 1 (Philadelphia Electric Co.)[3]	Pottstown, Pa.	GE	Boiling water	1,065,000	3,294,000	1974	
William H. Zimmer Nuclear Power Station, Unit 1 (Cincinnati Gas & Electric Co., Columbus & Southern Ohio Electric Co., and Dayton Power & Light Co)[3]	Moscow, Ohio	GE	Boiling water	810,000	2,436,000	1974	

Pennsylvania Power & Light Co , Unit 1		GE	Boiling water	1,052,000	3,293,000	1975	
Shoreham Nuclear Power Station (Long Island Lighting Co.)[3]	Brookhaven, N Y.	GE	Boiling water	819,000	2,436,000	1975	
William H. Zimmer Nuclear Power Station, Unit 2 (Cincinnati Gas & Electric Co., Columbus & Southern Ohio Electric Co., and Dayton Power & Light Co.)[3]	Moscow, Ohio	GE	Boiling water	810,000	2,436,000	1975	
William B. McGuire Nuclear Station, Unit 1 (Duke Power Co.)	Cowans Ford Dam, N. C.	West	Pressurized water	1,150,000	3,423,000	1975	
Forked River Nuclear Generating Station, Unit 1 (Jersey Central Power & Light Co.)	Forked River, N. J.	Comb.	Pressurized water	1,129,000	3,390,000	1975	
San Onofre Nuclear Generating Station, Unit 2 (Southern California Edison Co., and San Diego Gas & Electric Co.)[3]	San Clemente, Calif.	Comb.	Pressurized water	1,140,000	3,410,000	1975	
Malibu Nuclear Plant, Unit 1 (Los Angeles Department of Water & Power)[3,4]	Corral Canyon, Calif.	West.	Pressurized water	462,000	1,473,000	1976	
Bailly Generating Station (Northern Indiana Public Service Co.)	Dunes Acres, Ind	GE	Boiling water	660,000	1,931,000	1976	
Carolina Power & Light Co.	North Carolina	GE	Boiling water	821,000		1976	
Newbold Island Nuclear Generating Station, Unit 2 (Public Service Electric & Gas Co.)[3]	Newbold Island, N. J.	GE	Boiling water	1,088,000	3,293,000	1976	
Edwin I. Hatch Nuclear Plant, Unit 2 (Georgia Power Co.)	Baxley, Ga.	GE	Boiling water	786,000	2,436,000	1976	
Aguirre Nuclear Power Plant (Puerto Rico Water Resources Authority)	Puerto Rico	West	Pressurized water	583,000		1976	
Arkansas Nuclear One, Unit 2 (Arkansas Power & Light Co.)	London, Ark.	Comb.	Pressurized water	950,000		1976	
Limerick Generating Station, Unit 2 (Philadelphia Electric Co.)[3]	Pottstown, Pa.	GE	Boiling water	1,065,000	3,294,000	1976	
San Onofre Nuclear Generating Station, Unit 3 (Southern California Edison Co., and San Diego Gas & Electric Co)[3]	San Clemente, Calif	Comb.	Pressurized water	1,140,000	3,410,000	1976	
LaSalle County Nuclear Station, Unit 1 (Commonwealth Edison Co)	Seneca, Ill	GE	Boiling water	1,100,000		1976	
LaSalle County Nuclear Station, Unit 2 (Commonwealth Edison Co)	Seneca, Ill.	GE	Boiling water	1,100,000		1977	
Consolidated Edison Co [3]	Verplanck, N Y	GE	Boiling water	1,115,000	3,293,000	1977	
Pennsylvania Power & Light Co., Unit 2		GE	Boiling water	1,052,000	3,293,000	1977	
Bell Station (New York State Gas & Electric Co)[6]	Lansing, N. Y.	GE	Boiling water	838,000	2,436,000		
William B McGuire Nuclear Station, Unit 2 (Duke Power Co)	Cowans Ford Dam, N C	West.	Pressurized water	1,150,000	3,423,000	1977	
SHUT DOWN OR DISMANTLED							
Hallam Nuclear Power Facility, Sheldon Station (AEC and Consumers Public Power District[4,7]	Hallam, Nebr	AI	Sodium graphite	75,000	256,000	1962	1964
Carolinas–Virginia Tube Reactor (Carolinas–Virginia Nuclear Power Associates, Inc.)[3 4,8]	Parr, S C	West.	Pressure tube, heavy water	17,000	65,000	1963	1967
Piqua Nuclear Power Facility (AEC and City of Piqua)[3 4]	Piqua, Ohio	AI	Organic cooled and moderated	11,400	45,500	1963	1967
Boiling Nuclear Superheater Power Station (AEC and Puerto Rico Water Resources Authority)[3 4]	Punta Higuera, P R	Comb.	Boiling water integral nuclear superheat	16,500	50,000	1964	1968
Pathfinder Atomic Power Plant (Northern States Power Co)[3 4,9]	Sioux Falls, S Dak	AC	Boiling water, nuclear superheat	58,500	190,000	1964	1968
Elk River Reactor (AEC and Rural Cooperative Power Association)[3,4,10]	Elk River, Minn.	AC	Boiling water	22,000	58,200	1962	1970

1. POWER REACTORS (Continued)

B. Dual-Purpose Plants

Name and/or owner	Location	Principal nuclear contractor	Type	Power[1] Plant, net kW(e)	Power[1] Reactor, kW(t)	Start up
OPERABLE						
N Reactor (AEC and Washington Public Power Supply System)[11]	Richland, Wash	DUN	Graphite	790,000		1963
PLANNED						
Midland Nuclear Power Plant, Unit 1 (Consumers Power Co of Michigan)[3 12]	Midland, Mich	B&W	Pressurized water	492,000	2,468,000	1973
Midland Nuclear Power Plant, Unit 2 (Consumers Power Co of Michigan)[3 12]	Midland, Mich	B&W	Pressurized water	818,000	2,468,000	1974

C. Propulsion (Maritime)

Name and/or owner	Nuclear designer	Shipbuilder	Type	Maximum shaft horsepower	Power,[1] kW(t)	Start-up
OPERABLE						
Nuclear Ship SAVANNAH (Maritime Administration—operated by FAST, Inc)[3]	B&W	NYSC	Pressurized water	22,000	80,000	1961

2. EXPERIMENTAL POWER-REACTOR SYSTEMS

A. Electric-Power Systems

Name (all owned by AEC except as noted)	Designation	Location	Principal nuclear contractor	Type	Power[1] Plant, net kW(e)	Power[1] Reactor, kW(t)	Start-up	Shut-down
OPERABLE								
Saxton Nuclear Experimental Reactor Project (Saxton Nuclear Experimental Corp)[3]		Saxton, Pa	West	Pressurized water	3,000	28,000	1962	
Experimental Breeder Reactor No 2	EBR-2	NRTS, Idaho	ANL	Sodium cooled, fast	16,500	62,500	1963	
Southwest Experimental Fast Oxide Reactor (Southwest Atomic Energy Associates)[3]	SEFOR	Strickler, Ark	GE	Sodium cooled, fast	No elec	20,000	1969	
SHUT DOWN OR DISMANTLED								
Boiling Reactor Experiment No 1	BORAX-1	NRTS, Idaho	ANL	Boiling water	No elec	1,400	1953	1954
Homogeneous Reactor Experiment No 1	HRE-1	Oak Ridge, Tenn	ORNL	Aqueous homogeneous solution (UO_2SO_4)	140	1,000	1952	1954

s Alamos Power Reactor Experiment No 1	LAPRE-1	Los Alamos, N. Mex.	LASL	Aqueous homogeneous (phosphoric acid)	No elec.	2,000	1956	1957
Boiling Reactor Experiments[14]	BORAX-2, 3, 4	NRTS, Idaho	ANL	Boiling water	2,400	15,500	1954	1958
Los Alamos Power Reactor Experiment No 2	LAPRE-2	Los Alamos, N. Mex.	LASL	Aqueous homogeneous (phosphoric acid)	No elec	1,000	1959	1959
Homogeneous Reactor Experiment No. 2	HRE-2	Oak Ridge, Tenn	ORNL	Aqueous homogeneous solution (UO_2SO_4)	300	5,200	1957	1961
Organic Moderated Reactor Experiment[15]	OMRE	NRTS, Idaho	AI	Organic cooled and moderated	No. elec.	16,000	1957	1963
Los Alamos Molten Plutonium Reactor Experiment	LAMPRE-1	Los Alamos, N. Mex.	LASL	Fast molten plutonium fueled, sodium cooled	No elec.	1,000	1961	1963
Experimental Beryllium Oxide Reactor[16]	EBOR	NRTS, Idaho	GGA	Gas cooled, BeO moderated	No elec	10,000		
Vallecitos Boiling Water Reactor (General Electric Company and Pacific Gas & Electric Co.)[3]	VBWR	Pleasanton, Calif	GE	Boiling water	5,000	50,000	1957	1963
Experimental Breeder Reactor No 1[17]	EBR-1	NRTS, Idaho	ANL	Sodium cooled, fast	150	1,400	1951	1964
Heavy Water Components Test Reactor	HWCTR	Savannah River Laboratory, Aiken, S. C.	du Pont	Pressurized heavy water	No elec.	61,000	1962	1964
Boiling Reactor Experiment No. 5	BORAX-5	NRTS, Idaho	ANL	Boiling water, integral nuclear superheat	2,500	20,000	1962	1964
Sodium Reactor Experiment (AEC and Southern California Edison Co.)[18]	SRE-PEP	Santa Susana, Calif.	AI	Sodium graphite	7,500	30,000	1957	1966
Experimental Gas-Cooled Reactor[19]	EGCR	Oak Ridge, Tenn	KE–AC	Gas cooled, graphite moderated	21,000	84,300		
Experimental Organic Cooled Reactor[20]	EOCR	NRTS, Idaho	Fluor–AI	Organic cooled and moderated	No elec.	40,000		
ESADA Vallecitos Experimental Superheat Reactor (Empire States Atomic Development Associates and General Electric Company)[3]	EVESR	Pleasanton, Calif.	GE	Light-water moderated, superheater	No elec.	17,000	1963	1967
Experimental Boiling Water Reactor[21]	EBWR	Argonne, Ill.	ANL	Boiling water	4,000	100,000	1956	1967
Plutonium Recycle Test Reactor	PRTR	Richland, Wash.	BNW	Pressure tube, heavy-water moderated and cooled	No elec.	85,000	1960	1969
Molten Salt Reactor Experiment[22]	MSRE	Oak Ridge, Tenn.	ORNL	Single region, graphite moderated	No elec.	8,000	1965	1969
Ultra High Temperature Reactor Experiment	UHTREX	Los Alamos, N. Mex.	LASL	Helium cooled	No elec.	3,000	1969	1970

B. Auxiliary Power (SNAP)

Name (all owned by AEC except as noted)	Designation	Location	Principal nuclear contractor	Type	Power[1]		Start-up	Shut-down
					Plant, net kW(e)	Reactor, kW(t)		
OPERABLE								
SNAP-2/10 A, TSF Shielding Experiment	SNAP-TSF	Oak Ridge, Tenn.	AI–ORNL	NaK cooled		10	1967	

B. Auxiliary Power (SNAP) (Continued)

Name (all owned by AEC except as noted)	Designation	Location	Principal nuclear contractor	Type	Power[1] Plant Net kW(e)	Power[1] Reactor kW(t)	Start up	Shut down
SHUT DOWN OR DISMANTLED								
SNAP-2 Experimental Reactor	SER	Santa Susana, Calif	AI	NaK cooled	No elec	50	1959	1961
SNAP-2 Developmental System	S2DS	Santa Susana, Calif	AI	NaK cooled	No elec	50	1961	1963
SNAP-10A Flight System Ground Test No 1	S10FS-1	Santa Susana, Calif	AI	NaK cooled	0 5	39	1964	1964
SNAP-8 Experimental Reactor	S8ER	Santa Susana, Calif	AI	NaK cooled	No elec	600	1962	1965
SNAP-10A Flight System[2,3]	S10FS-4	In orbit	AI	NaK cooled	0 5	39	1965	1965
SNAP-10A Flight System Ground Test No 3	S10FS-3	Santa Susana, Calif	AI	NaK cooled	0 5	39	1964	1966
SNAP-10A Flight System	S10FS-5	Santa Susana, Calif	AI	NaK cooled	0 5	39	(Spare)	
SNAP-8, Developmental Reactor	S8DR	Santa Susana, Calif	AI	NaK cooled		600	1968	1969

C. Space Propulsion (Rover)[2,4]

Name (all owned by AEC except as noted)	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Operation
BEING BUILT						
Test Bed Reactor	Pewee-2	NRDS, Nev	LASL	Open cycle liquid hydrogen		1971
Fuel Element Test Bed	NF-1	NRDS, Nev	LASL	Open cycle liquid hydrogen	50,000	1971
PLANNED						
Fuel Element Test Reactor	Pewee-3	NRDS, Nev	LASL	Open cycle, liquid hydrogen		1971
Fuel Element Test Reactor	Pewee-4	NRDS, Nev	LASL	Open cycle, liquid hydrogen		1972
SHUT DOWN OR DISMANTLED						
Nuclear Rocket Reactor Experiment	Kiwi-A	NRDS, Nev	LASL	Open cycle, liquid hydrogen	70,000	1959
Nuclear Rocket Reactor Experiment	Kiwi-A Prime	NRDS, Nev	LASL	Open cycle, liquid hydrogen	85,000	1960
Nuclear Rocket Reactor Experiment	Kiwi-A3	NRDS, Nev	LASL	Open cycle, liquid hydrogen	100,000	1960
Nuclear Rocket Reactor Experiment	Kiwi-B1A	NRDS, Nev	LASL	Open cycle, hydrogen gas cooled	300,000	1961
Nuclear Rocket Reactor Experiment	Kiwi-B1B	NRDS, Nev	LASL	Open cycle, liquid hydrogen	900,000	1962

Nuclear Rocket Reactor Experiment	Kiwi-B4A	NRDS, Nev	LASL	Open cycle, liquid hydrogen	500,000	1962
Nuclear Rocket Reactor Experiment	Kiwi-B4D	NRDS, Nev	LASL	Open cycle, liquid hydrogen	1,000,000	1964
Nuclear Rocket Reactor Experiment	Kiwi-B4E	NRDS, Nev	LASL	Open cycle, liquid hydrogen	950,000	1964
Nuclear Rocket Engine Reactor Experiment (NERVA)	NRX-A2	NRDS, Nev	AG–West	Open cycle, liquid hydrogen	1,100,000	1964
Nuclear Rocket Engine Reactor Experiment (NERVA)	NRX A3	NRDS, Nev	AG West	Open cycle, liquid hydrogen	1,120,000	1965
Nuclear Rocket Reactor Experiment	Phoebus 1A	NRDS, Nev	LASL	Open cycle, liquid hydrogen	1,070,000	1965
Nuclear Rocket Reactor Engine System Test (NERVA)	NRX-A4/EST	NRDS, Nev	AG–West	Open cycle, liquid hydrogen	1,190,000	1966
Nuclear Rocket Engine Reactor Experiment (NERVA)	NRX-A5	NRDS, Nev	AG–West	Open cycle, liquid hydrogen	1,100,000	1966
Nuclear Rocket Reactor Experiment	Phoebus 1B	NRDS, Nev	LASL	Open cycle, liquid hydrogen	1,400,000	1967
Nuclear Rocket Engine Experiment (NERVA)	NRX-A6	NRDS, Nev	AG–West	Open cycle, liquid hydrogen	1,100,000	1967
Nuclear Rocket Reactor Experiment	Phoebus 2A	NRDS, Nev	LASL	Open cycle, liquid hydrogen	4,200,000	1968
Fuel Element Test Reactor	Pewee-1	NRDS, Nev	LASL	Open cycle, liquid hydrogen	514,000	1968
Ground Experimental Engine Experiment	XE-Prime	NRDS, Nev	AG–West	Open cycle, liquid hydrogen	1,100,000	1968

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

A. General Irradiation Test

Name and/or owner	Designation	Location	Principal nuclear contractor	Operator	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE								
Engineering Test Reactor (AEC)	ETR	NRTS, Idaho	KE–GE	INC	Tank	175,000	1957	
General Electric Test Reactor[3]	GETR	Pleasanton, Calif	Owner	Owner	Tank	50,000	1958	
Plum Brook Reactor Facility (NASA)[3]	NASA-TR	Sandusky, Ohio	NASA	NASA	Tank	60,000	1961	
Advanced Test Reactor (AEC)	ATR	NRTS, Idaho	Ebasco–B&W	INC	Tank	250,000	1968	
PLANNED								
Fast Flux Test Facility (AEC)	FFTF	Richland, Wash	WADCO	WADCO	Sodium cooled	400,000	1974	
SHUT DOWN OR DISMANTLED								
Westinghouse Testing Reactor[3]	WTR	Waltz Mill, Pa	Owner	Owner	Tank	60,000	1959	1962
Materials Testing Reactor (AEC)[25]	MTR	NRTS, Idaho	ORNL–ANL–Blaw-Knox	INC	Tank	40,000	1952	1970

B. High-Power Research and Test

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE							
Argonne Research Reactor (AEC)	CP-5	Argonne, Ill.	ANL	Heavy water	5,000	1954	
Omega West Reactor (AEC)	OWR	Los Alamos, N. Mex.	LASL	Tank	8,000	1956	
Industrial Reactor Laboratories, Inc.[3]		Plainsboro, N. J.	AMF	Pool	5,000	1958	
Oak Ridge Research Reactor (AEC)	ORR	Oak Ridge, Tenn.	ORNL	Tank	30,000	1958	
Brookhaven Medical Research Reactor (AEC)	MRR	Upton, N Y.	Daystrom	Tank	5,000	1959	
Union Carbide Corp.[3]	UCNR	Sterling Forest, N. Y.	AMF	Pool	5,000	1961	
Babcock & Wilcox Nuclear Development Center Test Reactor[3]	BAWTR	Lynchburg, Va.	Owner	Pool	6,000	1964	
Ames Laboratory Research Reactor (AEC)	ALRR	Ames, Iowa	AMF	Heavy water	5,000	1965	
Brookhaven High Flux Beam Research Reactor (AEC)	HFBR	Upton, N. Y.	BNL	Heavy water	40,000	1965	
High Flux Isotope Reactor (AEC)	HFIR	Oak Ridge, Tenn.	ORNL	Tank flux trap	100,000	1965	
National Bureau of Standards[3]	NBSR	Gaithersburg, Md.	NBS–B&R	Heavy water	10,000	1967	
SHUT DOWN OR DISMANTLED							
Brookhaven Research Reactor (AEC)	BGRR	Upton, N. Y.	HKF	Graphite	20,000	1950	1969
Sandia Engineering Reactor (AEC)	SER	Sandia Base, N. Mex	Sandia	Tank	5,000	1962	1970

C. Safety Research and Test

Name (all owned by AEC)	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE							
Special Power Excursion Reactor Test No. 4	SPERT-4	NRTS, Idaho	INC	Pool	Transient	1962	
Transient Reactor Test	TREAT	NRTS, Idaho	ANL	Graphite	Transient	1959	
Intrinsic Subcritical Assembly[26]	SNAPTRAN-1	Santa Susana, Calif.	AI	Be-reflected SNAP-10A	Transient	1968	
BEING BUILT							
Power-Burst Facility	PBF	NRTS, Idaho	INC	Tank	Transient, 20,000	1971	
Loss of Fluid Test	LOFT	NRTS, Idaho	INC	Pressurized water	50,000	1973	
SHUT DOWN OR DISMANTLED							
SNAP-10A Transient Test No. 3[27]	SNAPTRAN-3	NRTS, Idaho	PPC–AI	H_2O-reflected SNAP-10A	Transient	1964	1964

Special Power Excursion Reactor Test No. 1	SPERT-1	NRTS, Idaho	PPC	Open tank	Transient	1955	1964
Kiwi—Transient Test Reactor	Kiwi-TNT	NRDS, Nev.	LASL	Kiwi/NERVA	Transient	1965	1965
Special Power Excursion Reactor Test No. 2[28]	SPERT-2	NRTS, Idaho	PPC	Pressurized water	Transient	1960	1965
SNAP-10A Transient Test No. 2[27]	SNAPTRAN-2	NRTS, Idaho	AI–PPC	Be-reflected SNAP-10A	Transient	1965	1966
Kinetic Experiment on Water Boilers	KEWB	Santa Susana, Calif	AI	Homogeneous	Transient	1956	1967
Special Power Excursion Reactor Test No. 3	SPERT-3	NRTS, Idaho	PPC	Pressurized water	Transient	1958	1968

D. General Research

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE							
Bulk Shielding Reactor (AEC)[29]	BSR	Oak Ridge, Tenn	ORNL	Pool	2,000	1950	
Los Alamos Water Boiler (AEC)	SUPO	Los Alamos, N. Mex.	LASL	Homogeneous	25	1950	
North American Rockwell Water Boiler Neutron Source (AEC)[30]	AE-6(WBNS)	Santa Susana, Calif.	AI	Homogeneous	3	1952	
Physical Constants Test Reactor (AEC)	PCTR	Richland, Wash.	BNW	Graphite	0 1	1955	
Thermal Test Reactor No. 2 (AEC)	TTR-2	Richland, Wash	BNW	Graphite	0.1	1955	
Los Alamos HYDRO Reactor (AEC)	HYDRO	Los Alamos, N. M.	LASL			1956	
Battelle Memorial Institute[3]	BRR	West Jefferson, Ohio	AMF	Pool	2,000	1956	
Argonne National Laboratory (AEC)	AGN-201-108	Argonne, Ill.	AGN	Homog solid	Neglig.	1957	
Argonne Nuclear Assembly for University Training (AEC)	Argonaut (CP-11)	Argonne, Ill.	ANL	Graphite/water	10	1957	
General Electric Nuclear Test Reactor[3]	NTR	Pleasanton, Calif.	GE	Light water	100	1957	
Livermore Pool Type Reactor (AEC)	LPTR	Livermore, Calif	FW	Tank	3,000	1957	
Argonne Thermal Source Reactor (AEC)	ATSR	Argonne, Ill	ANL	Thermal	10	1957	
North American Rockwell Corp [3]	L-77	Canoga Park, Calif.	AI	Homogeneous	Neglig.	1958	
Babcock & Wilcox Lynchburg Pool Reactor[3]	LPR	Lynchburg, Va.	Owner	Pool	1,000	1958	
Gulf General Atomic Incorporated, TRIGA-Mk I Prototype Reactor[3,31]	TRIGA-Mk I	La Jolla, Calif.	GGA	U–Zr hydride	250	1958	
Pawling Research Reactor (United Nuclear Corp)[3]	PRR	Pawling, N. Y.	UNC	Light water	Neglig.	1958	
Radiation Effects Reactor (Lockheed Aircraft Corp.)[3,32]	RER	Dawsonville, Ga.	Lockheed	Pool	3,000	1958	
Fast Source Reactor (AEC)	AFSR	NRTS, Idaho	ANL	Fast	1	1959	
Omaha Veterans Administration Hospital[3]	TRIGA-Mk I	Omaha, Nebr	GGA	U–Zr hydride	18	1959	
Gulf General Atomic Incorporated, Advanced TRIGA-Mk F Prototype Reactor[3,33]	TRIGA-Mk F	La Jolla, Calif	Owner	U–Zr hydride	1,500	1960	
Shield Test and Irradiation Reactor (AEC)[34]	STIR	Santa Susana, Calif	AI	Pool	1,000	1961	
Health Physics Research Reactor (AEC)[35]	HPRR	Oak Ridge, Tenn	ORNL	Fast burst	10	1962	
NASA Mock-Up Reactor[3]	MUR	Sandusky, Ohio	Lockheed	Light water, pool	100	1963	
Northrop Corporate Laboratories (Space Radiation Laboratory)[3,31]	TRIGA-Mk F	Hawthorne, Calif.	GGA	U–Zr hydride	1,000	1963	

D. General Research (Continued)

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Power[1] kW(t)	Start-up	Shut-down
OPERABLE (Continued)							
USAEC European–Asian Exhibit Program[36] (AEC)			Lockheed	Pool	10	1963	
Biological Research Reactor (AEC)	JANUS	Argonne, Ill	ANL	Tank	200	1964	
Rhode Island Nuclear Science Center[3]		Fort Kearney, R. I.	GE	Pool	2,000	1964	
AGN Industrial Reactor[3]	AGNIR	San Ramon, Calif.	AGN	Pool–TRIGA core	250	1965	
Gulf General Atomic Incorporated, TRIGA-Mk III Prototype Reactor[3]	TRIGA-Mk III	La Jolla, Calif.	Owner	U–Zr hydride	1,500	1965	
Sandia Pulsed Reactor II (AEC)	SPR-II	Sandia Base, N Mex.	Sandia	Prompt burst	Transient	1967	
Annular Core Pulsed Reactor (AEC)	TRIGA-ACPR	Sandia Base, N Mex	GGA	U–Zr hydride	Transient	1967	
Dow Chemical Co.[3]	TRIGA-Mk I	Midland, Mich.	GGA	U–Zr hydride	100	1967	
High Temperature Lattice Test Reactor (AEC)	HTLTR	Richland, Wash.	PNL	Graphite	2	1967	
Accelerator Pulsed Fast Critical Assembly[3,37]	APFA-III	La Jolla, Calif.	GGA	Fast	1	1967	
U. S. Geological Survey Laboratory[3,31] (Department of the Interior)	TRIGA-Mk I	Denver, Colo.	GGA	U–Zr hydride	1,000	1969	
USAEC Latin American Demonstration Reactor Center[38] (AEC)			Lockheed	Pool	10	1969	
SHUT DOWN OR DISMANTLED							
Chicago Pile 1, rebuilt as CP-2 (Manhattan Engineer District—AEC)[39]	CP-2	Chicago, Ill.	Met Lab.	Graphite	0.2–2	1942	1954
Oak Ridge Graphite Reactor (AEC)	X-10	Oak Ridge, Tenn.	CL	Graphite	3,800	1943	1963
Argonne CP-3, rebuilt as CP-3′ (Manhattan Engineer District—AEC)	CP-3′	Palos Park, Ill.	Met. Lab.	Heavy water	300	1944	1954
Los Alamos Water Boiler (AEC)	HYPO	Los Alamos, N Mex.	LASL	Homogeneous	5.5	1944	1950
Los Alamos Fast Reactor (AEC)	Clementine	Los Alamos, N. Mex.	LASL	Fast, plutonium fuel, mercury cooled	25	1946	1953
Livermore Water Boiler (AEC)	LIWB	Livermore, Calif.	AI	Homogeneous	0.5	1953	1961
Illinois Institute of Technology Research Institute (Armour Research Foundation)[3]	ARR(L-54)	Chicago, Ill.	AI	Homogeneous	75	1956	1967
Atomics International[3]	L-47	Canoga Park, Calif.	AI	Homogeneous	Negligible	1957	1958
American Radiator & Standard Sanitary Corp.[40]	UTR-1	Mountain View, Calif.	ARSS	Graphite/water	Negligible	1958	1960
The Curtiss-Wright Nuclear Research Laboratory of the Commonwealth of Pennsylvania		Quehanna, Pa.	Owner	Pool	1,000	1958	1966
Lockheed Aircraft Corp.		Dawsonville, Ga.	Lockheed	Pool	Negligible	1960	1960
Gulf General Atomic Incorporated (World Agricultural Fair—U S. Exhibit Reactor)[41]	TRIGA-Mk II	San Diego, Calif.	GGA	U–Zr hydride	50	1960	1960
UTR Test Reactor (American Radiator & Standard Sanitary Corp)[3]		Mountain View, Calif	Owner	Graphite/water	Negligible	1961	1963
Louisiana State University Nuclear Science Center (Sandia Nuclear Assembly for Reactor Experiments)[42]	SNARE	Baton Rouge, La.	Sandia	Pool	1	1965	1966
Aerojet-General Corporation	AGN-201P-103	San Ramon, Calif	AGN	Homog. solid	Negligible	1957	1966
Sandia Pulsed Reactor (AEC)[43]	SPR	Sandia Base, N. Mex.	Sandia	Prompt burst		19	1967

Low Intensity Test Reactor (AEC)	LITR	Oak Ridge, Tenn	ORNL	Tank	3,000	1950	1968
Brookhaven Neutron Source Reactor No. 1 (AEC)	SCHIZO	Upton, N. Y	BNL	Tank	100	1958	1970
Nuclear Effects Reactor (AEC)[44]	FRAN	NRTS, Idaho	UCLRL/PPC	Prompt burst	Transient	1962	1970
Argonne Low Power Research Reactor (AEC)[45]	Juggernaut	Argonne, Ill	ANL	Graphite/water	250	1962	1970
Brookhaven Neutron Source Reactor No. 2 (AEC)	PHRENIC	Upton, N. Y.	BNL	Tank	100	1965	1970

E. University Research and Teaching

(Footnote 3 applies to all reactors in this section)

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE							
Texas A&M University	AGN-201-106	College Station, Tex.	AGN	Homog. solid	Negligible	1957	
Catholic University of America	AGN-201-101	Washington, D. C.	AGN	Homog. solid	Negligible	1957	
Colorado State University	AGN-201-109	Fort Collins, Colo.	AGN	Homog. solid	Negligible	1957	
Oklahoma State University of Agriculture and Applied Science	AGN-201-102	Stillwater, Okla.	AGN	Homog. solid	Negligible	1957	
Georgia Institute of Technology[46]	AGN-201-104	Atlanta, Ga.	AGN	Homog. solid	Negligible	1957	
University of New Mexico[47]	AGN-201M-112	Albuquerque, N. Mex	AGN	Homog. solid	Negligible	1957	
University of Michigan (Ford Nuclear Reactor)		Ann Arbor, Mich.	B&W	Pool	2,000	1957	
University of Utah	AGN-201-107	Salt Lake City, Utah	AGN	Homog. solid	Negligible	1957	
Massachusetts Institute of Technology	MITR	Cambridge, Mass.	ACF	Heavy water	5,000	1958	
Oregon State University	AGN-201-114	Corvallis, Oreg.	AGN	Homog. solid	Negligible	1958	
University of Arizona	TRIGA-Mk I	Tucson, Ariz.	GGA	U–Zr hydride	100	1958	
University of Delaware	AGN-201-113	Newark, Del	AGN	Homog. solid	Negligible	1958	
University of Oklahoma	AGN-211-102	Norman, Okla.	AGN	Homog solid, pool	Negligible	1958	
Iowa State University	UTR-10	Ames, Iowa	ARSS	Graphite/water	10	1959	
Leland Stanford University		Palo Alto, Calif	GE	Pool	10	1959	
University of Florida	UFTR	Gainesville, Fla.	GNEC	Graphite/water	100	1959	
University of Wyoming	L-77	Laramie, Wyo	AI	Homogeneous	Negligible	1959	
Virginia Polytechnic Institute	UTR-10	Blacksburg, Va.	ARSS	Graphite/water	100	1959	
West Virginia University	AGN-211-103	Morgantown, W. Va.	AGN	Homog. solid, pool	Negligible	1959	
Worcester Polytechnic Institute		Worcester, Mass.	GE	Pool	10	1959	
Puerto Rico Nuclear Center (AEC)	L-77	Mayaguez, P R	AI	Homogeneous	Negligible	1959	
Puerto Rico Nuclear Center (AEC)[48]		Mayaguez, P. R	AMF	Pool	1,000	1960	
North Carolina State University		Raleigh, N. C.	Cook	Graphite/water	10	1960	
University of California at Los Angeles, School of Engineering and Applied Science	Educator	Los Angeles, Calif.	AMF	Graphite/water	100	1960	
University of Illinois	TRIGA-Mk III	Urbana–Champaign, Ill.	GGA	U–Zr hydride	1,500	1960	
University of Maryland	UMNE-1	College Park, Md.	AC	Tank	10	1960	
University of Virginia		Charlottesville, Va.	Owner–B&W	Pool	1,000	1960	
University of Wisconsin[31,49]		Madison, Wis.	GE	Pool–TRIGA core	1,000	1960	
Nuclear Science Center Reactor, Texas A&M University[31,50]	NSCR	College Station, Tex	Convair	Pool–TRIGA core	1,000	1961	
Ohio State University		Columbus, Ohio	Lockheed	Pool	10	1961	

E. University Research and Teaching (Continued)

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE (Continued)							
University of Kansas	Model 4180	Lawrence, Kans.	BAC	Pool	10	1961	
University of Missouri at Rolla		Rolla, Mo.	CW	Pool	200	1961	
University of Washington	Educator	Seattle, Wash.	AMF	Graphite/water	100	1961	
Washington State University[31,51]		Pullman, Wash.	GE	Pool–TRIGA core	1,000	1961	
Western New York Nuclear Research Center, Inc. (State University of New York)	PULSTAR	Buffalo, N. Y.	AMF	Pool	2,000	1961	
Cornell University[31]	TRIGA-Mk II	Ithaca, N. Y.	GGA	U–Zr hydride	100	1962	
Kansas State University[31]	TRIGA-Mk II	Manhattan, Kans.	GGA	U–Zr hydride	250	1962	
Purdue University		West Lafayette, Ind.	Lockheed	Pool	10	1962	
Cornell University Zero Power Reactor	ZPR	Ithaca, N. Y.	Vitro	Tank	Negligible	1962	
University of Nevada	L-77	Reno, Nev.	AI	Homogeneous	Negligible	1963	
University of Texas[31]	TRIGA-Mk I	Austin, Tex.	GGA	U–Zr hydride	250	1963	
Manhattan College		New York, N. Y.	AMF	Tank	Negligible	1964	
Georgia Tech. Research Reactor	GTRR	Atlanta, Ga.	GNEC	Heavy water	1,000	1964	
Penn State TRIGA Reactor (Pennsylvania State University)[31,52]	PSTR	University Park, Pa.	Owner	Pool–TRIGA core	1,000	1965	
University of California[31]	TRIGA-Mk III	Berkeley, Calif.	GGA	U–Zr hydride	1,000	1966	
University of Missouri		Columbia, Mo.	Owner–IC	Tank	5,000	1966	
New York University[53]	AGN-201M-105	New York, N. Y.	AGN	Homog. solid	Negligible	1967	
Oregon State University[31]	TRIGA-Mk II	Corvallis, Oreg.	GGA	U–Zr hydride	1,000	1967	
Brigham Young University	L-77	Provo, Utah	AI	Homogeneous	Negligible	1967	
Idaho State University[54]	AGN-201P-103	Pocatello, Idaho	AGN	Homog. solid	Negligible	1967	
Reed College	TRIGA-Mk I	Portland, Oreg.	GGA	U–Zr hydride	250	1968	
Michigan State University[30,55]	TRIGA-Mk I	East Lansing, Mich.	GGA	U–Zr hydride	250	1969	
University of California[31]	TRIGA-Mk I	Irvine, Calif	GGA	U–Zr hydride	250	1969	
BEING BUILT							
Mississippi State University[56]	RRR	State College, Miss.	Owner–NSA	Homogeneous	Negligible		
Lowell Technological Institute		Lowell, Mass.	GE	Pool	1,000		
Columbia University[31]	TRIGA-Mk II	New York, N Y.	GGA	U–Zr hydride	250	1970	
North Carolina State University	PULSTAR	Raleigh, N. C.	AMF	Pool	1,000	1971	
PLANNED							
Colorado State University	TRIGA-Mk III	Fort Collins, Colo.	GGA	Tank	1,000		
New York University	TRIGA-Mk I	New York, N. Y.	GGA	U–Zr hydride	250	1970	
New York Hall of Science[31]	TRIGA-Mk II	New York, N. Y.	GGA	U–Zr hydride	250	1971	
University of California	TRIGA-Mk I	Santa Barbara, Calif.	GGA	U–Zr hydride	1,000		
University of Illinois	LOPRA	Urbana, Ill.			10		
SHUT DOWN OR DISMANTLED							
William Marsh Rice University	AGN-211-101	Houston, Tex	AGN	Homog. solid, pool	Negligible	1959	1965

PART II PRODUCTION REACTORS

1. MATERIALS PRODUCTION

(All owned by AEC)

Designation	Nuclear designer	Type	Location	Startup	Shutdown
OPERABLE*					
KE Reactor	GE	Graphite	Richland, Wash.	1955	
P Reactor	du Pont	Heavy water	Savannah River Plant, Aiken, S. C.	1954	
K Reactor	du Pont	Heavy water	Savannah River Plant, Aiken, S C.	1954	
C Reactor	du Pont	Heavy water	Savannah River Plant, Aiken, S. C.	1955	
SHUT DOWN					
R Reactor	du Pont	Heavy water	Savannah River Plant, Aiken, S. C.	1953	1964
DR Reactor	GE	Graphite	Richland, Wash.	1950	1964
H Reactor	GE	Graphite	Richland, Wash.	1949	1965
I Reactor	du Pont	Graphite	Richland, Wash.	1945	1965
D Reactor	du Pont	Graphite	Richland, Wash.	1944	1967
L Reactor	du Pont	Heavy water	Savannah River Plant, Aiken, S. C.	1954	1968
B Reactor	du Pont	Graphite	Richland, Wash.	1944	1968
C Reactor	GE	Graphite	Richland, Wash.	1952	1969
KW Reactor	GE	Graphite	Richland, Wash	1955	1970

*The N Reactor, Richland, Wash , is listed on page 12, see also footnote 11.

2. PROCESS DEVELOPMENT

Name (all owned by AEC)	Designation	Location	Nuclear designer	Type	Power,[1] kW(t)	Startup
OPERABLE						
Process Development Pile	PDP	Savannah River Laboratory, Aiken, S C	du Pont	Heavy water	1	1953
Standard Pile	SP	Savannah River Laboratory, Aiken, S C.	du Pont	Graphite	2–10	1953
Resonance Test Reactor	RTR	Savannah River Laboratory, Aiken, S. C.	du Pont	Heavy water	1	1967
Hanford 305 Test Reactor	HTR	Richland, Wash	du Pont	Graphite	Neglig.	1944
Savannah River Test Pile 305	SR-305	Savannah River Laboratory, Aiken, S. C.	du Pont	Graphite	1	1953

PART III MILITARY REACTORS

1. DEFENSE POWER-REACTOR APPLICATIONS

A. Remote Installations

Name (all owned by DOD)	Designation[57]	Location	Principal nuclear contractor	Type	Power[1] Plant, net kW(e)	Power[1] Reactor, kW(t)	Start-up	Shut-down
OPERABLE								
Stationary Medium Power Plant No 1 (formerly APPR-I)	SM-1	Fort Belvoir, Va.	Alco	Pressurized water	1,855	10,000	1957	
Portable Medium Power Plant No 3A	PM-3A	McMurdo Sound, Antarctica	Martin	Pressurized water	1,500	9,510	1962	
Stationary Medium Power Plant No. 1A[58]	SM-1A	Fort Greely, Alaska	Alco	Pressurized water	1,650	20,200	1962	
STURGIS Floating Nuclear Power Plant[59]	MH-1A	Gatun Lake, Canal Zone	Martin	Pressurized water	10,000	45,000	1967	
SHUT DOWN OR DISMANTLED								
Portable Medium Power Plant No. 2A[60]	PM-2A	Camp Century, Greenland	Alco	Pressurized water	1,560	10,000	1960	1963
Portable Medium Power Plant No. 1	PM-1	Sundance, Wyo	Martin	Pressurized water	1,000	9,370	1962	1968

B. Propulsion (Naval)

Name (all owned by U. S. Navy)	Designation[61]	Shipbuilder	Start-up
OPERABLE			
USS NAUTILUS	SSN571	Electric Boat (Groton)	1954
USS SEAWOLF[62]	SSN575	Electric Boat (Groton)	1960
USS SKATE	SSN578	Electric Boat (Groton)	1957
USS SWORDFISH	SSN579	Portsmouth	1958
USS SARGO	SSN583	San Francisco Bay	1958
USS SEADRAGON	SSN584	Portsmouth	1959
USS SKIPJACK	SSN585	Electric Boat (Groton)	1958
USS HALIBUT	SSN587	San Francisco Bay	1959
USS SCAMP	SSN588	San Francisco Bay	1961
USS SCULPIN	SSN590	Ingalls	1961
USS SHARK	SSN591	Newport News	1960
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 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	San Francisco Bay	1965
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 ASPRO	SSN648	Ingalls	1968
USS WILL ROGERS	SSBN65	Electric Boat (Groton)	1967
USS LAPON	SSN661	Newport News	1967
USS GURNARD	SSN662	San Francisco Bay	1968
USS HAMMERHEAD	SSN663	Newport News	1967
USS SEA DEVIL	SSN664	Newport News	1968
USS HAWKBILL	SSN666	Mares Island	1970

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	San Francisco Bay	1966
USS SNOOK	SSN592	Ingalls	1961
USS PERMIT	SSN594	San Francisco Bay	1962
USS PLUNGER	SSN595	San Francisco Bay	1962
USS BARB	SSN596	Ingalls	1963
USS TULLIBEE	SSN597	Electric Boat (Groton)	1960
USS GEORGE WASHINGTON	SSBN598	Electric Boat (Groton)	1959
USS PATRICK HENRY	SSBN599	Electric Boat (Groton)	1960
USS THEODORE ROOSEVELT	SSBN600	San Francisco Bay	1960
USS ROBERT E LEE	SSBN601	Newport News	1960
USS ABRAHAM LINCOLN	SSBN602	Portsmouth	1960
USS POLLACK	SSN603	NYSC	1963
USS HADDO	SSN604	NYSC	1964
USS JACK	SSN605	Portsmouth	1965
USS TINOSA	SSN606	Portsmouth	1963
USS DACE	SSN607	Ingalls	1963
USS ETHAN ALLEN	SSBN608	Electric Boat (Groton)	1961
USS SAM HOUSTON	SSBN609	Newport News	1961
USS THOMAS A EDISON	SSBN610	Electric Boat (Groton)	1961
USS JOHN MARSHALL	SSBN611	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 THOMAS JEFFERSON	SSBN618	Newport News	1962
USS ANDREW JACKSON	SSBN619	San Francisco Bay	1963
USS JOHN ADAMS	SSBN620	Portsmouth	1964
USS HADDOCK	SSN621	Ingalls	1967
USS JAMES MONROE	SSBN622	Newport News	1963
USS NATHAN HALE	SSBN623	Electric Boat (Groton)	1963
USS WOODROW WILSON	SSBN624	San Francisco Bay	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	San Francisco Bay	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	San Francisco Bay	1964
USS SAM RAYBURN	SSBN635	Newport News	1964
USS NATHANAEL GREENE	SSBN636	Portsmouth	1964
USS STURGEON	SSN637	Electric Boat (Groton)	1966
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 FLYING FISH	SSN673	Electric Boat (Groton)	1969
USS TREPANG	SSN674	Electric Boat (Groton)	1970
USS LONG BEACH (2 reactors)	CGN9	Bethlehem	1961
USS ENTERPRISE (8 reactors)	CVAN65	Newport News	1960
USS BAINBRIDGE (2 reactors)	DLGN25	Bethlehem	1962
USS TRUXTUN (2 reactors)	DLGN35	NYSC	1967
Deep Submergence Research Vehicle	NR-1	Electric Boat (Groton)	1969
BEING BUILT			
POGY	SSN647	NYSC/Ingalls	
SAND LANCE	SSN660	Portsmouth	
GUITARRO	SSN665	Mares Island	
PINTADO	SSN672	Mares Island	
BLUEFISH	SSN675	Electric Boat (Groton)	
BILLFISH	SSN676	Electric Boat (Groton)	
DRUM	SSN677	Mares Island	
ARCHERFISH	SSN678	Electric Boat (Groton)	
SILVERSIDES	SSN679	Electric Boat (Groton)	
REDFISH	SSN680	Ingalls	
BATFISH	SSN681	Electric Boat (Groton)	
TUNNY	SSN682	Ingalls	
PARCHE	SSN683	Ingalls	
CAVALLA	SSN684	Electric Boat (Groton)	
Submarine	SSN685	Electric Boat (Groton)	
Submarine	SSN686	Newport News	
Submarine	SSN687	Newport News	
NIMITZ (2 reactors)	CVAN68	Newport News	
EISENHOWER (2 reactors)	CVAN69	Newport News	
CALIFORNIA (2 reactors)	DLGN36	Newport News	
Guided Missile Frigate (2 reactors)	DLGN37	Newport News	
PLANNED			
Submarine	SSN688	Unassigned	
Submarine	SSN689	Unassigned	
Submarine	SSN690	Unassigned	
Guided Missile Frigate (2 reactors)	DLGN38	Unassigned	

			Start-up	Shut-down
SHUT DOWN OR DISMANTLED				
SEAWOLF Sodium Reactor[62]		Electric Boat (Groton)	1956	1959
USS THRESHER[63]	SSN593	Portsmouth	1961	1963
USS SCORPION[63]	SSN589	Electric Boat (Groton)	1960	1968
USS TRITON (2 reactors)	SSN586	Electric Boat (Groton)	1959	1968

2. DEVELOPMENTAL POWER

A. Electric-Power Experiments and Prototypes

Name (all owned by AEC)	Designation[57]	Location	Principal nuclear contractor	Type	Power[1] Plant, net kW(e)	Power[1] Reactor, kW(t)	Start-up	Shut-down
SHUTDOWN OR DISMANTLED								
Stationary Low Power Plant No 1	SL-1	NRTS, Idaho	ANL	Boiling water	300	2,200	1958	1961
Gas Cooled Reactor Experiment	GCRE	NRTS, Idaho	AGN	Gas cooled, light water moderated	No elec	2,200	1960	1962
Mobile Low Power Plant No 1	ML-1	NRTS, Idaho	AGN	Gas cooled, light water moderated	300	3,300	1961	1965

B. Propulsion Experiments and Prototypes

Name (all owned by AEC)	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE							
S1W Reactor Facility	S1W	NRTS, Idaho	West	Pressurized water		1953	
Large Ship Reactor Prototype (2 reactors)	A1W	NRTS, Idaho	West.	Pressurized water		1958	
Submarine Advanced Reactor Prototype	S3G	West Milton, N Y	GE	Pressurized water		1958	
Small Submarine Reactor Prototype	S1C	Windsor, Conn	Comb	Pressurized water		1959	
Destroyer Reactor Prototype	D1G	West Milton, N Y	GE	Pressurized water		1962	
Natural Circulation Test Plant	S5G	NRTS, Idaho	GE	Pressurized water		1965	
SHUT DOWN OR DISMANTLED							
Submarine Intermediate Reactor Mark A	S1G	West Milton, N Y	GE	Sodium		1955	1957
Aircraft Reactor Experiment	ARE	Oak Ridge, Tenn	ORNL	Molten salt	1,500	1954	1954
Heat Transfer Reactor Experiment No 1	HTRE-1	NRTS, Idaho	ANPD	Air cooled	20,000	1956	1957
Heat Transfer Reactor Experiment No 2	HTRE-2	NRTS, Idaho	ANPD	Air cooled	14,000	1957	1961
Heat Transfer Reactor Experiment No 3	HTRE-3	NRTS, Idaho	ANPD	Air cooled	32,000	1958	1961
Experimental Propulsion Test Reactor	TORY IIA	NTS, Nev	UCLRL	Air cooled	150,000	1960	1961
Experimental Propulsion Test Reactor[64]	TORY IIC	NTS, Nev	UCLRL	Air cooled	600,000	1964	1964

3. TEST AND RESEARCH

A. Test

Name (all owned by AEC except as noted)	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE							
Ground Test Reactor (USAF)	GTR	Fort Worth, Tex.	Convair	Pool	10,000	1953	
Aerospace Systems Test Reactor (USAF)	ASTR	Fort Worth, Tex.	Convair	Light water	10,000	1954	
Tower Shielding Reactor No. 2	TSR-2	Oak Ridge, Tenn.	ORNL	Light water	100	1960	
SHUT DOWN OR DISMANTLED							
Tower Shielding Reactor No. 1	TSR-1	Oak Ridge, Tenn.	ORNL	Tank	500	1954	1958
Nuclear Engineering Test Reactor (USAF)	NETR	Dayton, Ohio	Maxon–AC	Tank	10,000	1965	1970

B. Research

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE							
Thermal Test Reactor No 1 (AEC)	TTR-1	Schenectady, N. Y	KAPL	Graphite	10	1951	
Diamond Ordnance Radiation Facility (Harry Diamond Laboratories, USA)[31]	DORF	Forest Glen, Md.	GGA	TRIGA-Mk F	250	1961	
Armed Forces Radiobiology Research Institute (DASA, DOD)[3,31]	AFRRI	Bethesda, Md.	GGA	U–Zr hydride	100	1962	
Walter Reed Research Reactor (Walter Reed Army Institute of Research, USA)[3]	WRRR	Washington, D. C.	AI	Homogeneous	50	1962	
Fast Burst Reactor Facility (Army Missile Test and Evaluation Directorate, USA)	FBRF	White Sands, N. Mex.	Kaman	Bare, fast, prompt burst	10	1964	
Nuclear Effects Reactor (AEC)	Super KUKLA	NTS, Nev.	UCLRL	Prompt burst	Transient	1964	
Aberdeen Pulsed Reactor Facility (Ballistic Research Laboratories, USA)	APRF	Aberdeen, Md.	UNC	Bare, fast, prompt burst	10	1968	
SHUT DOWN OR DISMANTLED							
Naval Research Reactor (USN)[3]	NRR	Washington, D. C	NRL	Pool	1,000	1956	1970
U. S. Naval Postgraduate School (USN)[3]	AGN-201-100	Monterey, Calif.	AGN	Homog. solid	Neglig.	1956	1970
Army Materials Research Reactor (Army Materials and Mechanics Research Center, USA)[3]	AMRR	Watertown, Mass.	BAC	Pool	5,000	1960	1970

PART IV REACTORS FOR EXPORT

1. POWER REACTORS[65]

A. Central-Station Electric Power

Name and/or owner	Location	Principal nuclear contractor	Type	Power[1]		Start-up
				Plant, net kW(e)	Reactor, kW(t)	
OPERABLE						
Germany, Kahl Nuclear Power Station (Rhine-Westphalia Power Co , RWE)	Kahl-am-Main	GE	Boiling water	15,600	60,000	1960
Italy, Garigliano Nuclear Power Station (Project ENSI of SENN)	Punta Fiume (on Garigliano River)	GE	Boiling water	150,000	506,000	1963
Japan, Japan Power Demonstration Reactor (JAERI)	Tokai-Mura	GE	Boiling water	11,250	45,000	1963
Italy, Project Enrico Fermi of SELNI, Edisonvolta	Trino Vercellese	West	Pressurized water	256,000	615,000	1964
France, Franco-Belgian Society for Nuclear Energy of Ardennes, SENA	Givet (near Chooz)	West	Pressurized water	266,000	825,000	1966
Germany, Kernkraftwerk-KWE-Bayernwerk, or KRB	Gundremmingen (near Gunzburg)	GE	Boiling water	237,000	801,000	1966
Spain, José Cabrera Nuclear Power Plant, Unit 1	Near Madrid	West	Pressurized water	153,000	515,000	1968
India, Tarapur Nuclear Power Station, Units 1 and 2	Tarapur (north of Bombay)	GE	Boiling water	380,000	1,322,000	1969
Japan, Tsuruga Nuclear Power Plant (Japan Atomic Power Company, JAPCO No 2)	Tsuruga, Honshu	GE	Boiling water	432,800		1969
Switzerland, NOK Nuclear Electric Generating Station, Unit 1	Beznau (near Baden)	West	Pressurized water	350,000	1,130,000	1969
BEING BUILT						
Japan, Fukushima Station, Unit 1 (Tokyo Electric Power Corp)	Fatuba, Honshu	GE	Boiling water	440,000		1970
Japan, Fukushima Station, Unit 2 (Tokyo Electric Power Corp)	Fatuba, Honshu	GE	Boiling water	784,000		1973
Japan, Mihama Nuclear Power Station, Unit 1 (Kansai Electric Power Co)	Niu, Honshu	West	Pressurized water	340,790		1970
Japan, Mihama Nuclear Power Station, Unit 2 (Kansai Electric Power Co)	Niu, Honshu	West	Pressurized water	500,000		1972
Spain, José Cabrera Nuclear Power Plant, Unit 2	Near Madrid	West	Pressurized water	450,000		1972
Spain, Santa Maria de Garona Nuclear Power Plant	Near Bilbao	GE	Boiling water	440,000		1969
Switzerland, NOK Nuclear Electric Generating Station, Unit 2	Beznau (near Baden)	West	Pressurized water	350,000	1,130,000	1972
Switzerland, Bernische Kraftwerk A G , or BKW	Muehleberg (near Bern)	GE	Boiling water	306,200		1971
PLANNED						
Sweden, Swedish State Power Board	Ringhals	West.	Pressurized water	809,000		1974
Japan, Kansai Electric Power Co , Unit 3	Takahama	West	Pressurized water	826,000		1974
Korea, Korea Electric Power Co , Unit 1		West	Pressurized water	500,000		1975
Taiwan, Taiwan Power Co	Chin Shan	GE	Boiling water	604,000		1975
Italy	Pizcenza/Cremona	GE	Boiling water	750,000		1975

B. Propulsion

Name	Owner	Designer	Designation	Type	Start up
OPERABLE					
S5W for HMS DREADNOUGHT	Great Britain	West	S5W	Pressurized water	1962

2. TEST, RESEARCH, AND TEACHING

A. General Irradiation Test

Owner	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up
OPERABLE					
Japan, Atomic Energy Research Institute	Tokai-Mura	AMF	Heavy water, tank	10,000	1960
Netherlands, Reactor Center	Petten	AC	Tank (MTR)	45,000	1961
South Africa, Atomic Energy Board	Pelindaba (near Pretoria)	AC	Tank	20,000	1965
Sweden, Atomic Energy Company	Studsvik	AC	Tank (MTR)	30,000	1960

B. General Research

OPERABLE					
Australia, Atomic Energy Commission	Lucas Heights, New South Wales	ARSS	UTR 10	10	1961
Austria, Seibersdorf Research Center	Seibersdorf	AMF	Pool	5,000	1960
Colombia, Colombian Institute of Nuclear Affairs	Bogota	Lockheed	Pool	10	1965
Denmark, Atomic Energy Commission	Riso	AI	L-55	0 5	1957
Denmark, Atomic Energy Commission	Riso	FW	Tank	5,000	1958
Germany, Society for the Utilization of Nuclear Energy in Shipbuilding and Navigation, Inc	Geesthacht	B&W	Pool	5,000	1958
Germany, Brown Boveri/Krupp[66]	Julich	Interatom	L-77A	0 01	1967
West Berlin, City of (Institute for Nuclear Research)	West Berlin	AI	L-54	50	1958
Greece, Atomic Energy Commission	Athens	AMF	Pool	1,000	1961
Indonesia, Institute for Atomic Energy	Bandung	GGA	TRIGA-Mk II	250	1964
Israel, Atomic Energy Commission	Nahal Soreq	AMF	Pool	5,000	1960
Italy, Center for Military Applications of Nuclear Energy	Near Pisa	B&W	Pool	5,000	1963
Italy, National Committee for Nuclear Energy	Ispra	AC	Heavy water, tank	5,000	1959
Italy, National Committee for Nuclear Energy	Rome	GGA	TRIGA-Mk II	1,000	1960
Italy, SORIN Nuclear Center	Saluggia	AMF	Pool	1,000	1959
Korea, Atomic Energy Commission	Seoul	GGA	TRIGA-Mk II	100	1962
Pakistan, Atomic Energy Commission	Islamabad	AMF	Pool	5,000	1965

B. General Research (Continued)

Owner	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start up	Shut down
OPERABLE (Continued)						
Philippines, National Science Development Board	Quezon City	GE	Pool	1,000	1963	
Portugal, Nuclear Energy Board	Sacavém	AMF	Pool	1,000	1961	
Spain, Nuclear Energy Board	Moncloa	GE	Pool	3,000	1958	
Switzerland, Reactor, Inc [67]	Wuerenlingen	ORNL	Pool	1,000	1955	
Turkey, Atomic Energy Commission	Istanbul	AMF	Pool	1,000	1962	
Vietnam, Institute of Nuclear Research	Dalat	GGA	TRIGA-Mk II	250	1963	
Venezuela, Institute for Scientific Research	Caracas	GE	Pool	3,000	1960	
Yugoslavia, Josef Stefan Nuclear Institute[31]	Podgarica	GGA	TRIGA Mk II	250	1966	
Mexico, National Commission for Nuclear Energy[31]	Salazar	GGR	TRIGA-Mk III	1,000	1968	
BEING BUILT						
Italy, National Committee for Nuclear Energy	Padua	AMF	Pool	Negligible	1970	
Korea, Atomic Energy Research Institute	Seoul	GGA	TRIGA-Mk III	2,000	1974	
SHUT DOWN OR DISMANTLED						
Japan, Atomic Energy Research Institute	Tokai-Mura	AI	L-54	50	1957	1969

C. University Research and Teaching

Owner	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up
OPERABLE					
Austria, Vienna Polytechnic Institute[31]	Vienna	GGA	TRIGA-Mk II	250	1962
Brazil, University of São Paulo	São Paulo	B&W	Pool	5,000	1957
Brazil, University of Minas Gerais[68]	Belo Horizonte	GGA	TRIGA-Mk I	30	1960
Canada, McMaster University	Hamilton, Ont	AMF	Pool	1,000	1959
China, Republic of (National Tsing-Hua University)	Hsinchu	GE	Pool	1,000	1961
Congo, Republic of the, (University of Lovanium)[69]	Kinshasa	GGA	TRIGA-Mk I	50	1959
Finland, Institute of Technology[31]	Helsinki	GGA	TRIGA-Mk II	250	1962
Germany, Technical University of Munich	Munich	AMF	Pool	2,500	1957
Germany, Universities of Frankfurt and Darmstadt	Frankfurt	AI	L-54	50	1958
Germany, Johannes Gutenberg University of Mainz[31]	Mainz	GGA	TRIGA-Mk II	100	1965
Germany, Institute for Nuclear Medicine[70]	Heidelberg	GGA	TRIGA-Mk	250	1966
Iran, University of Tehran	Tehran	AMF	Pool	5,000	1967
Italy, University of Milan	Milan	AI	L-54	50	1959
Italy, University of Palermo	Palermo	AGN	201-110	Negligible	1960
Italy, University of Pavia[30]	Pavia	GGA	TRIGA-Mk II	250	1965
Japan, Kinki University	Osaka	ARSS	UTR-10	Negligible	1961

Japan, Musashi University	Kawasaki City	GGA	TRIGA-Mk II	100	1963
Japan, Rikkyo University	Yokosuka City	GGA	TRIGA-Mk II	100	1961
Netherlands, Delft Technical University[71]	Delft	AMF	Pool	2,000	1963
Switzerland, University of Basel[72]	Basel	AGN	211-100	Neglig.	1958
Switzerland, University of Geneva[73]	Geneva	AGN	201-111	Neglig.	1958
Thailand, Chulalongkorn University	Bangkok	CW	Pool	1,000	1962
United Kingdom, Queen Mary College, London University	London	ARSS	UTR-B	50	1964
United Kingdom, Scottish Research Reactor Center	East Kilbride	ARSS	UTR-100	100	1963
Uruguay, University of Montevideo[74]	Montevideo	Lockheed	Pool	10	1960
PLANNED					
Germany, Association for Radiation Research[30,70]	Munich	GGA	TRIGA-Mk III	1,000	1970
Germany, Medical College of Hanover[70]	Hanover	GGA	TRIGA-Mk I	250	1970

PART V CRITICAL ASSEMBLY FACILITIES

1. IDENTIFICATION OF FACILITIES

Abbreviation	Name and location of facility	Operator	No. of cells	No. of control panels
ANL	Argonne National Laboratory (AEC), Argonne, Ill.	ANL	4	4
ANL-ID	Argonne National Laboratory, Idaho Division (AEC), NRTS, Idaho	ANL	2	2
ARMF-I and -II	Advanced Reactivity Measurement Facility (AEC), NRTS, Idaho	INC	2	2
ATF	SNAP Acceptance Test Facility (AEC), Santa Susana, Calif.	AI	1	1
ATRC	Advanced Test Reactor Critical Facility (AEC), NRTS, Idaho	INC	1	1
Bettis	Bettis Atomic Power Laboratory (AEC), Pittsburgh, Pa.	West.	6	6
B&W	The Babcock & Wilcox Co., Lynchburg, Va.[3]	Owner	3	3
Comb.	Nuclear Engine Laboratory of Combustion Engineering, Inc., Windsor, Conn.	Owner	3	2
ECEL	Epithermal Critical Experiment Laboratory, Santa Susana, Calif.[3]	AI	1	1
ETRC	Engineering Test Reactor Critical Facility (AEC), NRTS, Idaho	INC	1	1
GGA	Gulf General Atomic Incorporated, San Diego, Calif.[3]	Owner	2	2
KAPL	Knolls Atomic Power Laboratory (AEC), Schenectady, N. Y.	GE	6	6
LASL	Los Alamos Scientific Laboratory (AEC), Los Alamos, N. Mex	LASL	3	3
Lockheed	Lockheed Aircraft Co., Critical Facility for RER, Dawsonville, Ga.[3]	Owner	1	1
LPTF	Low Power Test Facility (AEC), NRTS, Idaho	GE	2	2
Martin	Martin Co., Middle River, Md.[3]	Owner	3	3
NASA	Lewis Research Center, Cleveland, Ohio[3]	Owner	3	2
OR-CEF	Oak Ridge Critical Experiment Facility (AEC), Oak Ridge, Tenn.	UCC-ND	3	3
ORNL-PCA	Pool Critical Assembly, BSF Pool (AEC), Oak Ridge, Tenn.	ORNL	1	1
PNL-CML	Critical Mass Laboratory (AEC), Richland, Wash.	PNL	1	1
PNL-PRCF	Plutonium Recycle Critical Facility (AEC), Richland, Wash.	PNL	1	1
RFP-NSF	Nuclear Safety Facility, Rocky Flats Plant (AEC), Colo.	DOW	1	1
Rensselaer	Rensselaer Polytechnic Institute, Troy, N. Y.[3]	Owner	1	1

1. IDENTIFICATION OF FACILITIES (Continued)

Abbreviation	Name and location of facility	Operator	No of cells	No of control panels
SCF	SNAP Critical Facility (AEC), Santa Susana, Calif.	AI	1	1
SETF	SNAP Engineering Test Facility (AEC), Santa Susana, Calif.[75]	AI	2	2
UNC	United Nuclear Corporation, Development Division, Pawling, N. Y.[3]	Owner	4	3
West.	Westinghouse Reactor Evaluation Center Critical Experiment Station (CES) and Astronuclear Experimental Facility, Waltz Mill, Pa.[3]	Owner	2	2

2. IDENTIFICATION OF EXPERIMENTS AND STUDIES

A. Civilian

Facility	Subject of current experiment or study	Designation	Startup
OPERABLE			
AI, ECEL	Nuclear properties of fast reactor systems	ECEL	1960
AI, SCF	NASA Fast Reactor Critical Assembly	SCA-5	1970
AI, SCF	SNAP Safety Program	SCA-4A and 4B	1962
ANL	Basic fast reactor studies and mock-up for LMFBR	ZPR-6	1963
ANL[76]	Vacant	ZPR-7	1956
ANL	Vacant	ZPR-5	1957
ANL	Basic fast reactor studies and mock-up for LMFBR	ZPR-9	1967
ANL-ID	Basic fast reactor studies and mock-up for LMFBR	ZPR-3	1955
ANL-ID	Basic fast reactor studies and mock-up for LMFBR	ZPPR	1969
ARMF-II, Test Reactor Area (INC)	Reactor-physics constants for thermal and fast reactors, studies of fast-zoned reactor cores	ARMF-II	1962
ARMF-I, Test Reactor Area (INC)	Reactor-physics constants and reactivity changes caused by test-reactor irradiation	ARMF-I	1960
ATRC, Test Reactor Area (INC)	ATR physics, core-loading and core-design measurements	ATRC	1964
Bettis	Critical experiments	CCFA	1954
Bettis	LWB physics[77]	LWBCC	1963

B&W, Cell 1	Advanced Test Reactor criticals		1962
B&W, Cell 2[78]	Spectral Shift Control Reactor		1958
B&W Cell 3[78]	Small-lattice experiment		1958
ETRC, Test Reactor Area (INC)	ETR physics, core-loading and core-design measurements	ETRC	1957
GGA	Accelerator Pulsed Fast Critical Assembly	APFA-III	1967
GGA	Core design of thermionic power reactors	ECF	1970
LASL, Kiva I	Cold criticals for Rover reactors	ZEPO and Honeycomb	1957
LASL, Kiva III	Cold critical operation of Rover test reactors, environmental chamber, and general-purpose critical assembly	Godiva-IV	1962
LPTF, Cell 1	NASA Spherical Cavity Reactor Critical Experiment		1963
LPTF, Cell 2	THRITS experiments		1966
NASA, Materials and Stresses Building[79]	NASA Test Reactor critical experiments (NASA-ZPR-I system)		1959
NASA, Materials and Stresses Building	NASA Modified Zero Power Reactor II, solution-type critical facility		1969
OR-CEF, Building 9213, Cell E	Subcritical measurements in metallic uranium and Plexiglass lattices		1950
OR-CEF, Building 9213, Cell S	Uranium Metal–Graphite Array		1950
OR-CEF, Building 9213, Cell W	Reactor-physics and nuclear-safety studies with homogeneous uranium solutions, slightly enriched-uranium lattices in water, investigations of neutron absorbers as poisons in chemical-processing equipment, HFIR core reactivity studies		1950
ORNL-PCA, Building 3010	Physics research on reactivity effects	PCA	1958
PNL-CML	Plutonium criticals		1961
PNL-PRCF	Plutonium recycle criticals		1963
SGCF	Critical facility for flight-system acceptance testing		1963
Rensselaer	Critical experiment assembly		1966
UNC	Proof Test Facility	PTF	1967
West, CES	Reactor-fuel-measurement facility design		1958
BEING BUILT			
LASL, Kiva I	KING Reactor Mock-up	Kinglet	

B. Military

Facility	Subject of current experiment or study	Designation	Startup
OPERABLE			
Bettis	Surface-ship physics[77]	SS-CF	1957

2. IDENTIFICATION OF EXPERIMENTS AND STUDIES

B. Military (Continued)

Facility	Subject of current experiment or study	Designation	Startup
OPERABLE (Continued)			
Bettis	High-temperature physics and mock-up	HTTF	1959
Bettis	Physics measurements	CCFB	1960
Bettis	Clean critical experiments[77]	CCX	1961
KAPL	Full Core Physics Experiment	FCPE	1970
KAPL	Flexible Critical Experiments	FPR	1956
KAPL	Cold Water Experiments	CWA	1958
KAPL	High-temperature high-pressure physics and mock-up	PTR	1958
KAPL	Cold Water Reactor test assembly	CWTA	1960
Lockheed	RER core configurations	CERF	1958
LASL, Kiva II	Critical-configuration safety tests	Comet II	1953
LASL, Kiva II	Plated bare-plutonium sphere studies	Jezebel	1954
LASL, Kiva II	Spherical metal cores in thick metal reflector	Flattop	1957
LASL, Kiva II	Water-immersion safety tests	Water tank	1961
RFP	Critical-configuration safety tests	NSF	1965
BEING BUILT			
LASL, Kiva II	U(10)-metal cylinder in thick metal reflector	Big ten	

FOOTNOTES

1 Power capacity figures are based on the best available information In all instances thermal capacity of the nuclear reactor is given, the electrical output, when shown, is the net electrical capacity of the power plant For reactors being built or planned, plant capacity is rounded to the nearest hundred kilowatts Where a plant has a stretch capacity, the initial capacity is given until the stretch value is approved

2 The Shippingport station is provided with a turbogenerator rated at 90,000 kW(e) net Use of a heat dissipation system permits operation at 150,000 kW(e) gross equivalent on core 2 Power operation with core 2 began Apr 30, 1965

3 This facility is regulated by the AEC Director of Regulation and has been issued an operating license (or authorization) or a construction permit, or an application for same has been submitted

4 This project is under the Power Demonstration Program

20 EOCR construction was terminated in December 1962 The facility was mothballed prior to operation

21 The EBWR achieved 100,000 kW(t) on Nov 11, 1962 Operation of EBWR in the Boiling Water Program was closed out in December 1962 The reactor was used in support of the Plutonium Recycle Program and attained criticality using plutonium as its principal fuel on Sept 22, 1965 In support of that program it operated at power levels as high as 70,000 kW(t) Operation in that program was completed in June 1967

22 The MSRE was placed in standby in December 1969 pending determination of final disposition

23 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

5. In the Consolidated Edison Indian Point Station, the 615,000 kW(t) is increased by an oil-fired superheater to produce 265,000 net kW(e).
6. New York State Electric and Gas Corp. on Apr. 11, 1969, announced indefinite postponement of the Bell Station.
7. The Hallam Nuclear Power Facility was shut down in September 1964 due to moderator can failures. In August 1965 the Commission terminated its contract with Consumers Public Power District for operation of the nuclear plant. In May 1966 CPPD turned down their option to purchase the plant. In June 1966 the AEC announced deactivation and dismantling of the nuclear facility.
8. The last CVTR shutdown occurred Jan. 24, 1967. A license amendment issued June 14, 1967, authorizes CVNPA to possess but not operate the CVTR.
9. 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.
10. The 58,200 kW(t) capacity of the Elk River Reactor is increased to 73,000 kW(t) by a fossil-fired superheater to produce 22,000 net kW(e). Thermal capacity of the reactor is equivalent to about 16,000 kW(e), the 14,800 kW(t) from the superheater is equivalent to about 6000 kW(e). Plant was shut down due to technical problems in February 1968, on Mar. 20, 1970, RCPA rejected an option to purchase ERR.
11. N Reactor, an AEC-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 (WPPSS). Initial electric power generation began Apr. 8, 1966. Full gross power output of 800 MW(e) utilizing N Reactor steam was achieved on Dec. 9, 1966.
12 Midland Unit 1 supplies 3,625,000 pounds per hour of process steam, and Unit 2 supplies 425,000 pounds per hour.
13. No footnote.
14. 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 July 17, 1955, produced sufficient electricity to light and power Arco, Idaho—a U. S. first BORAX 4, a further modification, operated from December 1956 to June 1958 when the experiment was shut down.
15. OMRE demonstrated the technical and economic feasibility of using liquid hydrocarbon terphenyls as coolant and/or moderator.
16 The EBOR reactor experiment was terminated in December 1966 prior to the completion of construction.
17. In a trial run on Dec. 21 and 22, 1951, EBR-1 generated the world's first electric power from nuclear energy and was the first to demonstrate, in July 1953, 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 November 1962 to December 1963. The reactor was decommissioned and dismantled early in 1964. The facility was dedicated as a historic landmark Aug. 26, 1966.
18. SRE operated at 20 MW(t) until shut down in February 1964 for modification to permit an increase in power level to 30 MW(t). On Dec. 2, 1966, the AEC announced deactivation of SRE.
19. The EGCR project was terminated in January 1966 prior to the completion of construction.

shutting down the reactor An identical ground-test unit, S10FS-3, operated successfully for more than a year before being shut down in 1966. Another flight system unit, S10FS 5, is in storage at Santa Susana, Calif.

24. Typical space propulsion rockets operate for 20 to 40 min. Therefore space propulsion reactor experiments in context with other reactor applications operate for minutes rather than years
25 In August 1958 the MTR was operating up to 30,000 kW(t) using plutonium as fuel It demonstrated the ability of plutonium fuel elements to perform satisfactorily in a high flux power reactor. Operation as a test reactor was terminated on June 30, 1969, and a ^{240}Pu (Phoenix) core run in FY 1970. Facility in standby for possible use by others in FY 1972.
26 This reactor is basically the same as the SNAP-10A Transient Test Reactor No. 1 (SNAPTRAN-1) that operated at NRTS from 1963–1965 It was moved from NRTS to its present location in the SNAP Environmental Test Facility. It is being used to evaluate the effects of separated ^{155}Gd as a burnable poison and as a shut-down agent in the event of water immersion.
27. 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.
28 SPERT-II has been shut down and placed in standby for possible future use.
29. The BSR-2, which became operable in 1959, is a stainless-steel UO_2 core that can be used alternately in the same facility with BSR 1 (aluminum-alloy core).
30. The AE-6, also designated WBNS, was built and first operated at Downey, Calif. It was moved to Santa Susana in 1956.
31. This TRIGA reactor is capable of being pulsed and of steady state operation.
32. 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 in July 1962, and in August 1962 the USAF transferred the facility to the General Services Administration. Lockheed acquired title to the facility in March 1965.
33 This TRIGA reactor is licensed for routine pulsing of 4 dollars and 60 cents in excess-reactivity insertions
34. This reactor was previously designated STF for SNAP Shield Test Facility.
35. The HPRR was previously operated in the Nevada BREN facility. It is now installed in the Dosimetry Applications Research Facility.
36 This reactor was operated in the USAEC Atoms for Peace Exhibit in Vienna, Austria, in June 1963, in Belgrade, Yugoslavia, in September 1963, in Madrid, Spain, in April 1964, in Lisbon, Portugal, in April 1965, in Utrecht, Netherlands, in March 1966, in Dublin, Ireland, in September–October 1966, Ankara, Turkey, in April–May 1967, Tehran, Iran, in November–December 1967, Taipei, Taiwan, in April–May 1968, Seoul, Korea, in September–October 1968, and is scheduled for Manila, Philippines, in February–March 1969, it is scheduled for Bucharest, Romania, in October 1969
37. The APFA-III was previously operated as the KUKLA Prompt Critical Assembly at Lawrence Radiation Laboratory at Livermore, Calif.
38. This reactor is scheduled to operate initially in São Paulo, Brazil, in October 1969.

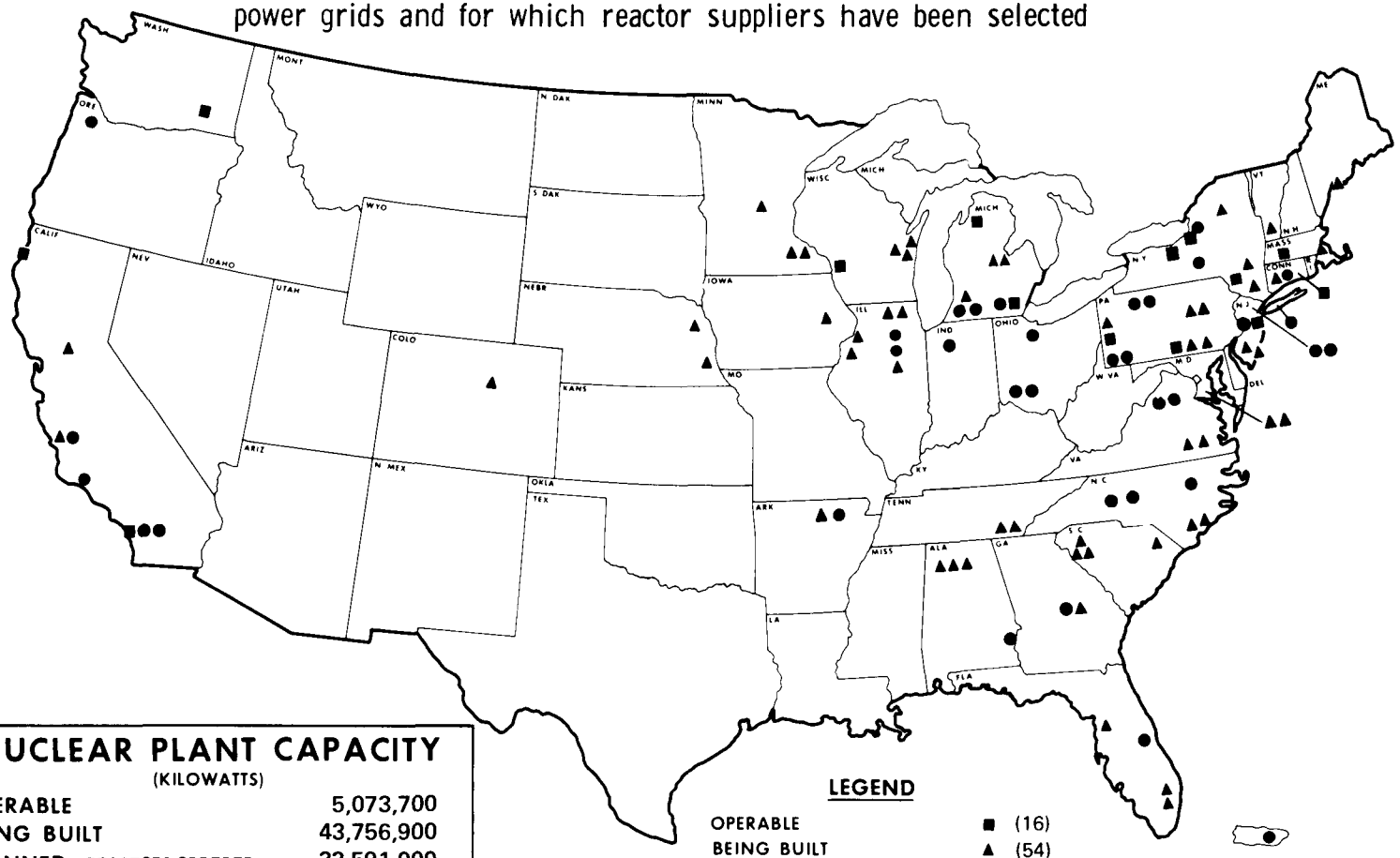
39. In 1943 the Manhattan Engineer District disassembled Chicago Pile 1 and rebuilt it at Palos Park, Ill., as Chicago Pile 2 CP-2 had a thermal-power level of 10 kW
40. This reactor was shipped abroad for exhibition purposes in the USAEC Atoms for Peace Exhibit in the Tokyo International Trade Fair in 1959, and in Cairo, Egypt, and Lahore, Pakistan, in 1960.
41. This TRIGA-Mk II was operated at the New Delhi World Agricultural Fair in 1960 It has been dismantled for storage in California by GGA.
42. In 1965 and 1966 this reactor was operated at Sandia, N Mex , as SNARE. Prior to that time it operated at the National Reactor Testing Station, Idaho, 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 in June 1966.
43. The SPR was retired in April 1967 and will be used as a laboratory device in a subcritical configuration only.
44. Until mid-1967, FRAN was operated by UCLRL at the Nevada Test Site It is now located in the former ML-1 reactor area at NRTS.
45 After the assembly and operation of this reactor in the government exhibit at Geneva in September 1958, it was dismantled and returned to ANL, where it was rebuilt as a 250-kW(t) Juggernaut.
46. AGN-201-104 operated at the University of Akron (Ohio) from 1957 until transferred to the Georgia Institute of Technology in 1967.
47 AGN-201-112 was operated at the University of California, Berkeley, beginning in 1957. The University of New Mexico filed an application in April 1966 for transfer and reconstruction of the reactor at a site on its campus The reactor achieved criticality at the University of New Mexico on Oct. 7, 1966.
48. The Puerto Rico Nuclear Center Pool Reactor is being converted to a 2 MW TRIGA with startup scheduled in 1970
49 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
50. 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
51 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 to 1000 kW(t)
52. From 1955 to 1965 the Penn State reactor was operated as a 200 kW(t) pool-type reactor fueled with MTR-type elements
53. 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 in April 1967.
54. The AGN-201P-103 was operated at San Ramon, Calif., by Aerojet-General Corporation from 1957 to 1966. In April 1967 Idaho State University applied for a license to operate the reactor at Pocatello, Idaho
55 The core of the Michigan State University reactor operated in the University of Illinois TRIGA facility from 1960 until transferred in 1968.
56. This reactor was originally operated by North Carolina State University as the Raleigh Research Reactor (RRR). It was transferred in March 1966 to Mississippi Lake, Panama Canal Zone, and began producing power to the Panama Canal power grid on Oct 5, 1968
60. The PM-2A was shut down on July 9, 1963, and dismantled during April–June 1964 The reactor vessel was then used by the AEC at the National Reactor Testing Station, Idaho, 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 Nov. 18, 1966, 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. The remaining parts of the primary system and the secondary system are in storage pending commitment by the Army for final disposition.
61. The abbreviations used here are defined as follows SSN, Submarine (Nuclear Propulsion), SSBN, Fleet Ballistic Missile Submarine (Nuclear Propulsion), DLGN, Guided Missile Frigate (Nuclear Propulsion), CGN, Guided Missile Cruiser (Nuclear Propulsion), CVAN, Attack Aircraft Carrier (Nuclear Propulsion)
62 The USS SEAWOLF, originally commissioned with a sodium-cooled reactor in March 1957, was recommissioned with a pressurized-water reactor on Sept 30, 1960.
63. The USS THRESHER (SSN593) was lost in the Atlantic on Apr. 10, 1963 The USS SCORPION (SSN589) was lost in the Atlantic on May 21, 1968
64. The Tory II-C was successfully tested at full design power during May 1964 Subsequent to cancellation of the Pluto program on July 1, 1964, the reactor was placed in the Pluto disassembly building at NTS for storage.
65 In addition to the export power reactors listed, Westinghouse provided the design and furnished nuclear components, including fuel elements, control rods, and instrumentation for the 11 5-MW(e) Belgium BR-3 pressurized-water reactor at Mol.
66. This L 77 reactor was operated in the commercial exhibit of the 1958 International Conference in Geneva and in the USAEC Atoms for Peace Exhibits in Beirut, Lebanon, in October 1961, in Athens, Greece, in May 1962, and in Bangkok, Thailand, in November 1962.
67 This is the 1955 Geneva Conference reactor rebuilt with increased power and now operating at Wuerenlingen, Switzerland.
68 This 30 KW(t) TRIGA Mk I is capable of power levels to 100 KW for limited periods
69 This TRIGA reactor was operated at the 1958 International Conference in Geneva prior to shipment to the University of Lovanium. It began operating at the University of Lovanium in June 1959 It is the first reactor to be operated on the African continent.
70. This reactor was sold through GGA licensee, Gutehoffnungshuette Sterkrade A.E
71. The Netherlands research reactor was originally operated at the Amsterdam International Exhibition in June 1957, major portions of the exhibition reactor system were used to fabricate the present reactor.

State University for reactivation. The original 10-kW research reactor was started up in 1953 and was dismantled in 1955. The reactor was reactivated with a 500-watt core in March 1957. Early in 1959 the reactor was modified for 100-watt operation and moved to a new location in the Nuclear Science Laboratory, and a new 10-kW heterogeneous-core Argonaut type reactor was built in the original RRR shield vacated by the homogeneous core The RRR was dismantled by N C. State in 1963

57. Reactors in the Army Power Program are identified by symbolic nomenclature 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
58. The SM-1A produces 38 million Btu/hr for space heating in addition to electrical output
59 The MH 1A was installed in the STURGIS (formerly the Liberty Ship CHARLES H. CUGLE), at Mobile, Ala Acceptance testing was performed at Fort Belvoir, Va , from April 1967 to June 27, 1967, when the Army accepted the plant from the Contractor In late July 1968 the plant was deployed to Gatun
72. This reactor was operated in the International Science Section of the Brussels Informational Exhibition, Apr. 15 to Oct. 1, 1958, prior to transfer to the University of Basel.
73. The AGN-201-111 was operated first in the USAEC Atoms for Peace Exhibit in Rome, Italy, in July 1958 and later in the commercial exhibit of the 1958 International Conference in Geneva prior to transfer to the University of Geneva
74. Prior to its sale to the University of Montevideo in 1966, this reactor was part of the USAEC Exhibit Program. It was in Buenos Aires, Argentina, in the fall of 1960, in Rio de Janeiro, Brazil, in the spring of 1961, in Lima, Peru, in the fall of 1961, in Mexico City in the spring of 1962, in Santiago, Chile, in the fall of 1962, in Bogotá, Colombia, in the spring of 1963, and in Montevideo, Uruguay, in the fall of 1963 The unit is expected to become operational in 1968.
75. The SETF has capability for full-power SNAP tests and has been used for critical-assembly tests.
76. 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 have been 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.
77 The cell has one control panel for two pots. Experiments may be operated in either pot, but not simultaneously.
78 The B&W Cells 2 and 3 share a control panel, only one cell can be operated at any one time.
79 The NASA ZPR-I and ZPR-II systems operate from the same control panel, but it is possible to operate only one system at a time.

NUCLEAR POWER PLANTS IN THE UNITED STATES

The nuclear power plants included in this map are ones whose power is being transmitted or is scheduled to be transmitted over utility electric power grids and for which reactor suppliers have been selected



NUCLEAR PLANT CAPACITY

(KILOWATTS)

OPERABLE		5,073,700
BEING BUILT		43,756,900
PLANNED	REACTORS ORDERED	32,591,000
	REACTORS NOT ORDERED	7,589,000
	TOTAL	89,010,600

ELECTRIC UTILITY CAPACITY BY CONVENTIONAL MEANS AS OF APRIL 30, 1970 313,854,808 KILOWATTS

LEGEND

OPERABLE	■	(16)
BEING BUILT	▲	(54)
*PLANNED (Reactors Ordered)	●	(35)

*8 more plants have been announced for which reactors have not yet been ordered.

U.S.Atomic Energy Commission
June 30, 1970

REACTOR INDEX

[REACTORS FOR EXPORT not included in the index (see pages 26 to 29).]