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UC-80

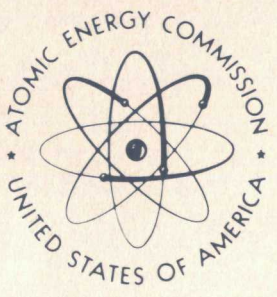
TID-8200(23rd Rev.)

MASTER

NUCLEAR REACTORS BUILT, BEING BUILT, or PLANNED

in the UNITED STATES as of Dec. 31, 1970

Prepared by Office of the
Assistant General Manager for Reactors



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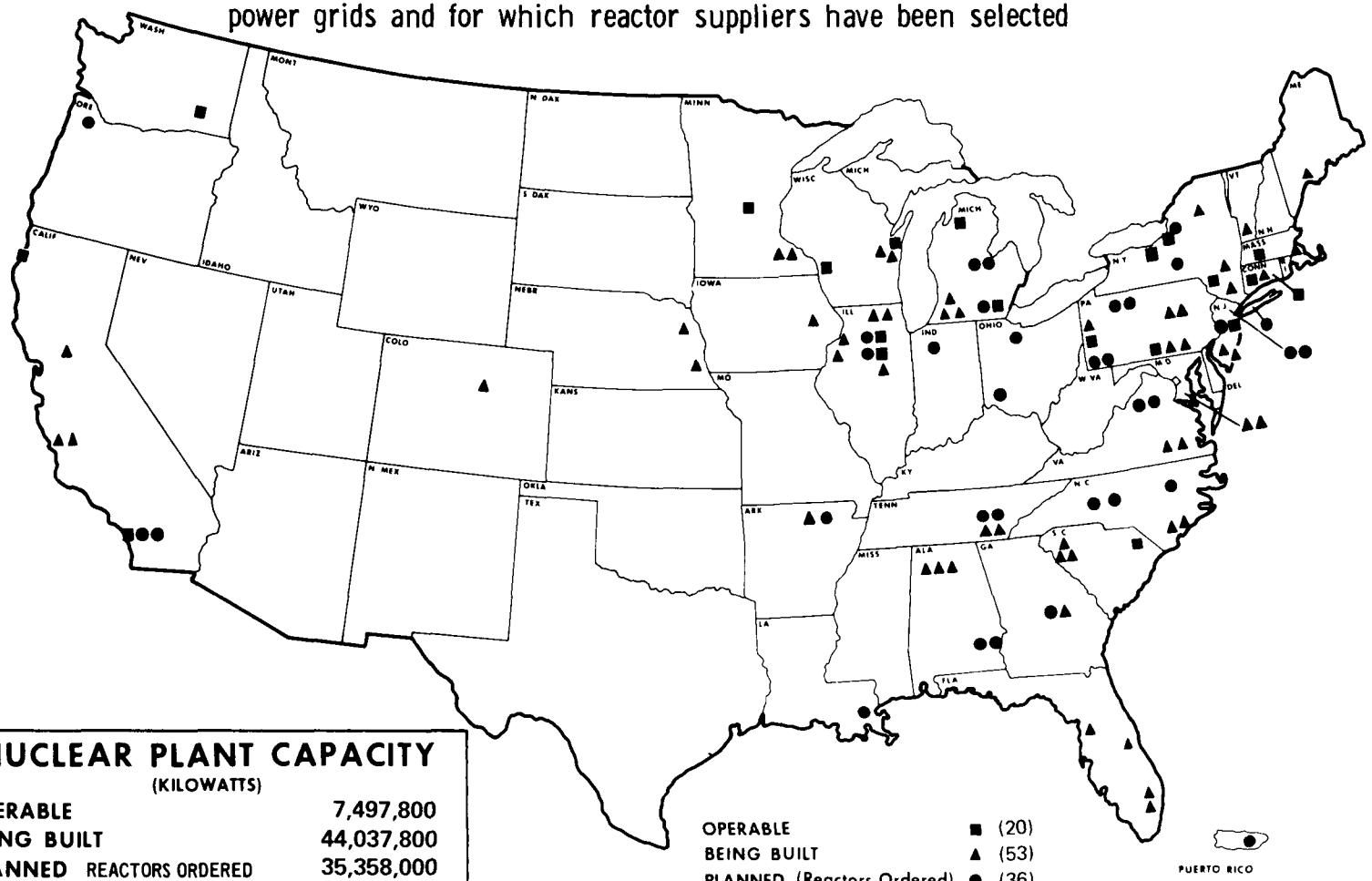
NUCLEAR REACTORS BUILT, BEING BUILT, or PLANNED

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	7,497,800
BEING BUILT	44,037,800
PLANNED REACTORS ORDERED	35,358,000
TOTAL	86,893,600

TOTAL ELECTRIC UTILITY CAPACITY AS OF OCTOBER 30, 1970 334,986,000 KILOWATTS

U.S. Atomic Energy Commission
December 31, 1970

FOREWORD

This compilation contains unclassified information about facilities built, being built, or planned in the United States for domestic use or export as of Dec. 31, 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. 27-30) excludes those which 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 6

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	19	53	34	6
B. Dual-Purpose Plants	1		2	
C. Propulsion (Maritime)	1			
2. Experimental Power-Reactor Systems				
A. Electric-Power Systems	3			23
B. Auxiliary Power (SNAP)	2			8
C. Space Propulsion (Rover)		3	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	2	2		8
D. General Research	34			23
E University Research and Teaching	53	5	4	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)	108	22	10	5
2. Developmental Power				
A. Electric-Power Experiments and Prototypes				3
B. Propulsion Experiments and Prototypes	6			7
3. Test and Research				
A. Test	3			2
B. Research	7			3
IV. REACTORS FOR EXPORT				
1. Power Reactors				
A. Central-Station Electric Power	12	10	2	
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.
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.
GE&ES	Gulf Energy & Environmental Systems, Inc., a subsidiary of Gulf Oil Corporation
GE	General Electric Company
GENMPO	General Electric Nuclear Materials and Propulsion Operation
GM	General Motors Corp.
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
Mare Island	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
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

PART I CIVILIAN REACTORS (DOMESTIC)

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						
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 Unit 1 (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
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	1,690,000	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
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
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
BEING BUILT						
Palisades Plant, Unit 1 (Consumers Power Co. of Michigan)[3]	South Haven, Mich.	Comb.	Pressurized water	700,000	2,212,000	1971
Dresden Nuclear Power Station, Unit 3 (Commonwealth Edison Co.)[3]	Morris, Ill.	GE	Boiling water	809,000	2,527,000	1971
Oconee Nuclear Station, Unit 1 (Duke Power Co.)[3]	Seneca, S. C.	B&W	Pressurized water	841,120	2,452,000	1971
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

A. Central-Station Electric Power (Continued)

Name and/or owner	Location	Principal nuclear contractor	Type	Power[1]		Start-up
				Plant, net kW(e)	Reactor, kW(t)	
BEING BUILT (Continued)						
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	655,000	1,998,000	1971
Point 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
Fort St. Vrain Nuclear Generating Station (Public Service Co. of Colorado)[3,4]	Platteville, Colo.	GGA	Gas cooled, graphite moderated	330,000	841,700	1971
Cooper Nuclear Station (Nebraska 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	1972
Three Mile Island Station, Unit 1 (Metropolitan Edison Co.)[3]	Middletown, Pa.	B&W	Pressurized water	810,000	2,452,000	1972
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	197
Rancho Seco Nuclear Generating Station, Unit 1 (Sacramento Municipal Utility District)[3]	Clay Station, Calif	B&W	Pressurized water	804,000	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
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	820,000	2,452,000	1972
Browns Ferry Nuclear Power Plant, Unit 3 (TVA)[3]	Decatur, Ala.	GE	Boiling water	1,064,500	3,293,000	1973
Oconee Nuclear Station, Unit 3 (Duke Power Co.)[3]	Seneca, S. C.	B&W	Pressurized water	886,000	2,568,000	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	1974
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
Hutchinson Island, Unit 1 (Florida Power & Light Co.)[3]	Fort Pierce, Fla	Comb	Pressurized water	813,000	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
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
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

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
PLANNED							
North Anna Power Station, Unit 1 (Virginia Electric & Power Co)[3]	Mineral, Va	West	Pressurized water	845,000	2,652,000	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	1,130,000	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, Unit 1 (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	
Shoreham Nuclear Power Station (Long Island Lighting Co)[3]	Brookhaven, N Y	GE	Boiling water	819,000	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	1,140,000	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	
Edwin I Hatch Nuclear Plant, Unit 2 (Georgia Power Co)	Baxley, Ga	GE	Boiling water	786,000	2,436,000	1975	
Aguirre Nuclear Power Plant (Puerto Rico Water Resources Authority)	Puerto Rico	West	Pressurized water	583,000	1 785,000	1975	
Arkansas Nuclear One, Unit 2 (Arkansas Power & Light Co)	London, Ark	Comb	Pressurized water	950,000	2,452,000	1975	
LaSalle County Nuclear Station, Unit 1 (Commonwealth Edison Co)	Seneca, Ill	GE	Boiling water	,078 000	3,293,000	1975	
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	
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	1977	

LaSalle County Nuclear Station, Unit 2 (Commonwealth Edison Co.)	Seneca, Ill	GE	Boiling water	1,100,000		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	1976	
Watts Bar Nuclear Plant, Unit 1 (Tennessee Valley Authority)		West.	Pressurized water	1,170,000		1976	
Watts Bar Nuclear Plant, Unit 2 (Tennessee Valley Authority)		West.	Pressurized water	1,170,000		1976	
Waterford Generating Station, Unit 3 (Louisiana Power & Light Co.)	Taft, La	Comb.	Pressurized water	1,165,000		1976	
Tennessee Valley Authority, Unit 1		B&W	Pressurized water	1,201,000		1977	
Tennessee Valley Authority, Unit 2		B&W	Pressurized water	1,201,000		1977	
(Consolidated Edison Co)[3], Verplanck No 1	Verplanck, N. Y	GE	Boiling water	1,115,000	3,293,000	1977	
Joseph M Farley Nuclear Plant, Unit 2	Dothen, Ala	West.	Pressurized water	829,000		1977	
(Pennsylvania Power & Light Co.), Susquehanna Steam Electric Station, Unit 1	Berwick, Pa.	GE	Boiling water	1,052,000	3,293,000	1978	
(Pennsylvania Power & Light Co.), Susquehanna Steam Electric Station, Unit 2	Berwick, Pa	GE	Boiling water	1,052,000	3,293,000	1979	
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

B. Dual-Purpose Plants

Name and/or owner	Location	Principal nuclear contractor	Type	Power[1]		Start-up
				Plant, net kW(e)	Reactor, kW(t)	
OPERABLE						
N Reactor (AEC and Washington Public Power Supply System)[11]	Richland, Wash	DUN	Graphite	790,000	4,000,000	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	1974
Midland Nuclear Power Plant, Unit 2 (Consumers Power Co. of Michigan)[3,12]	Midland, Mich.	B&W	Pressurized water	818,000	2,468,000	1975

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)[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]		Start-up	Shut-down
					Plant, net kW(e)	Reactor, kW(t)		
OPERABLE								
Saxton Nuclear Experimental Reactor Project (Saxton Nuclear Experimental Corp.)[3]		Saxton, Pa.	West	Pressurized water	3,000	23,500	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
Los 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.	12,000	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		1967
Vallecitos Boiling Water Reactor (General Electric Company and Pacific Gas & Electric Co.)[3]	VBWR	Pleasanton, Calif.	GE	Boiling water	5,000	33,000	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	2,600	20,000	1962	
Sodium Reactor Experiment (AEC and Southern California Edison Co.)[18]	SRE-PEP	Santa Susana, Calif.	AI	Sodium graphite	7,500	20,000	1957	1966
Experimental Gas-Cooled Reactor[19]	EGCR	Oak Ridge, Tenn.	KE–AC	Gas cooled, graphite moderated	21,900	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.	70,000	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	1968	1970

B. Auxiliary Power (SNAP)

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								
SNAP-2/10 A, TSF Shielding Experiment	SNAP-TSF	Oak Ridge, Tenn	AI–ORNL	NaK cooled		10	1967	
SHUT DOWN OR DISMANTLED								
SNAP-2 Experimental Reactor	SER	Santa Susana, Calif	AI	NaK cooled	No elec.	50	1959	1960
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[23]	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)[24]

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

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

Name (all owned by AEC except as noted)	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Operation
BEING BUILT (Continued)						
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		1972
Fuel Element Test Reactor	Pewee-4	NRDS, Nev.	LASL	Open cycle, liquid hydrogen		1973
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 Testing 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)[2,5]	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 and/or owner	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE							
Special Power Excursion Reactor Test No. 4 (AEC)	SPERT-4	NRTS, Idaho	INC	Pool	Transient	1962	
Transient Reactor Test (AEC)	TREAT	NRTS, Idaho	ANL	Graphite	Transient	1959	
Intrinsic Subcriticality Experiment (AEC)[26]	SNAPTRAN-1	Santa Susana, Calif.	AI	Be-reflected SNAP-10A	Transient	1968	
BEING BUILT							
Power-Burst Facility (AEC)	PBF	NRTS, Idaho	INC	Pulsed	Transient, 20,000	1971	
Loss of Fluid Test (AEC)	LOFT	NRTS, Idaho	INC	Pressurized water	50,000	1973	
SHUT DOWN OR DISMANTLED							
SNAP-10A Transient Test No. 3 (AEC)[27]	SNAPTRAN-3	NRTS, Idaho	PPC–AI	H_2O-reflected SNAP-10A	Transient	1964	1964
Special Power Excursion Reactor Test No. 1 (AEC)	SPERT-1	NRTS, Idaho	PPC	Open tank	Transient	1955	1964
Kiwi—Transient Test Reactor (AEC)	Kiwi-TNT	NRDS, Nev.	LASL	Kiwi/NERVA	Transient	1965	1965
Special Power Excursion Reactor Test No. 2 (AEC)[28]	SPERT-2	NRTS, Idaho	PPC	Pressurized water	Transient	1960	1965
SNAP-10A Transient Test No 2 (AEC)[27]	SNAPTRAN-2	NRTS, Idaho	AI–PPC	Be-reflected SNAP-10A	Transient	1965	1966
Kinetic Experiment on Water Boilers (AEC)	KEWB	Santa Susana, Calif.	AI	Homogeneous	Transient	1956	1967
Special Power Excursion Reactor Test No. 3 (AEC)	SPERT-3	NRTS, Idaho	PPC	Pressurized water	Transient	1958	1968
Special Power Excursion Reactor Test No. 4 (AEC)	SPERT-4	NRTS, Idaho	INC	Pool	Transient	1962	1970

D. General Research

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	
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	Negligible	1958	
Babcock & Wilcox Lynchburg Pool Reactor[3]	LPR	Lynchburg, Va	Owner	Pool	1,000	1958	
Gulf Energy & Environmental Systems, Inc, TRIGA-Mk I Prototype Reactor[3 31]	TRIGA-Mk I	La Jolla, Calif	Gulf E&ES	U Zr hydride	250	1958	
Pawling Research Reactor (United Nuclear Corp)[3]	PRR	Pawling, N Y	UNC	Light water	Negligible	1958	
Fast Source Reactor (AEC)	AFSR	NRTS, Idaho	ANL	Fast	1	1959	
Omaha Veterans Administration Hospital[3]	TRIGA-Mk I	Omaha, Nebr	Gulf E&ES	U–Zr hydride	18	1959	
Gulf Energy & Environmental Systems, Inc, 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	Gulf E&ES	U Zr hydride	1,000	1963	
USAEC European–Asian Exhibit Program[36] (AEC)			Lockheed	Pool	10	1969	
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	300	1965	
Gulf Energy & Environmental Systems, Inc, 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	Gulf E&ES	U–Zr hydride	Transient	1967	
Dow Chemical Co [3]	TRIGA-Mk I	Midland, Mich	Gulf E&FS	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	Gulf E&ES	Fast	1	1967	
U S Geological Survey Laboratory[3 31] (Department of the Interior)	TRIGA-Mk I	Denver, Colo	Gulf E&ES	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	3,500	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 Energy & Environmental Systems, Inc (World Agricultural Fair—U S Exhibit Reactor)[41]	TRIGA-Mk II	San Diego, Calif	Gulf E&ES	U–Zr hydride	50	1960	1960

D. General Research (Continued)

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
SHUT DOWN OR DISMANTLED (Continued)							
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	2	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		1961	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
Los Alamos HYDRO Reactor (AEC)	HYDRO	Los Alamos, N Mex	LASL			1956	1970
Radiation Effects Reactor (Lockheed Aircraft Corp [3 32]	RER	Dawsonville, Ga	Lockheed	Pool	3,000	1958	1970

E. University Research and Teaching

(Footnote 3 applies to all reactors in this section)

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	Gulf E&ES	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	Neglig	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	Gulf E&ES	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	
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	Gulf E&ES	U Zr hydride	100	1962	
Kansas State University[31]	TRIGA Mk II	Manhattan, Kans	Gulf E&ES	U Zr hydride	300	1962	
Purdue University		West Lafayette, Ind	Lockheed	Pool	10	1962	
Cornell University Zero Power Reactor	ZPR	Ithaca, N Y	Vitro	Tank	Neglig	1962	
University of Nevada	L 77	Reno, Nev	AI	Homogeneous	Neglig	1963	
University of Texas[31]	TRIGA-Mk I	Austin, Tex	Gulf E&ES	U–Zr hydride	250	1963	
Manhattan College		New York, N Y	AMF	Tank	Neglig	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	Gulf E&ES	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	Neglig	1967	
Oregon State University[31]	TRIGA-Mk II	Corvallis, Oreg	Gulf E&ES	U–Zr hydride	1,000	1967	
Brigham Young University	L-77	Provo, Utah	AI	Homogeneous	Neglig	1967	
Idaho State University[54]	AGN 201P-103	Pocatello, Idaho	AGN	Homog solid	Neglig	1967	
Reed College	TRIGA-Mk I	Portland, Oreg	Gulf E&ES	U Zr hydride	250	1968	
Michigan State University[30 55]	TRIGA-Mk I	East Lansing, Mich	Gulf E&ES	U–Zr hydride	250	1969	
University of California[31]	TRIGA-Mk I	Irvine, Calif	Gulf E&ES	U–Zr hydride	250	1969	
BEING BUILT							
Mississippi State University[56]	RRR	State College, Miss	Owner–NSA	Homogeneous	Neglig		
Lowell Technological Institute		Lowell, Mass	GE	Pool	1,000		
Columbia University[31]	TRIGA-Mk II	New York, N Y	Gulf E&ES	U–Zr hydride	300	1970	
North Carolina State University	PULSTAR	Raleigh, N C	AMF	Pool	1,000	1971	
University of Illinois	LOPRA	Urbana, Ill			10	1971	
PLANNED							
Colorado State University	TRIGA-Mk III	Fort Collins, Colo	Gulf E&ES	Tank	1,000		
New York University	TRIGA-Mk I	New York, N Y	Gulf E&ES	U–Zr hydride	250	1970	
New York Hall of Science[31]	TRIGA-Mk II	New York, N Y	Gulf E&ES	U–Zr hydride	250	1971	
University of California	TRIGA-Mk I	Santa Barbara, Calif	Gulf E&ES	U–Zr hydride	1,000		
SHUT DOWN OR DISMANTLED							
William Marsh Rice University	AGN-211-101	Houston, Tex	AGN	Homog solid, pool	Neglig	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
F 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 11, 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[5 7]	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-1)	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	Name (all owned by U. S. Navy)	Designation[61]	Shipbuilder	Start-up
OPERABLE							
USS NAUTILUS	SSN571	Electric Boat (Groton)	1954	USS LAFAYETTE	SSBN616	Electric Boat (Groton)	1963
USS SEAWOLF[62]	SSN575	Electric Boat (Groton)	1960	USS ALEXANDER HAMILTON	SSBN617	Electric Boat (Groton)	1963
USS SKATE	SSN578	Electric Boat (Groton)	1957	USS THOMAS JEFFERSON	SSBN618	Newport News	1962
USS SWORDFISH	SSN579	Portsmouth	1958	USS ANDREW JACKSON	SSBN619	San Francisco Bay	1963
USS SARGO	SSN583	San Francisco Bay	1958	USS JOHN ADAMS	SSBN620	Portsmouth	1964
USS SEADRAGON	SSN584	Portsmouth	1959	USS HADDOCK	SSN621	Ingalls	1967
USS SKIPJACK	SSN585	Electric Boat (Groton)	1958	USS JAMES MONROE	SSBN622	Newport News	1963
USS HALIBUT	SSN587	San Francisco Bay	1959	USS NATHAN HALE	SSBN623	Electric Boat (Groton)	1963
USS SCAMP	SSN588	San Francisco Bay	1961	USS WOODROW WILSON	SSBN624	San Francisco Bay	1963
USS SCULPIN	SSN590	Ingalls	1961	USS HENRY CLAY	SSBN625	Newport News	1963
USS SHARK	SSN591	Newport News	1960	USS DANIEL WEBSTER	SSBN626	Electric Boat (Groton)	1964
USS SNOOK	SSN592	Ingalls	1961	USS JAMES MADISON	SSBN627	Newport News	1964
USS PERMIT	SSN594	San Francisco Bay	1962	USS TECUMSEH	SSBN628	Electric Boat (Groton)	1964
USS PLUNGER	SSN595	San Francisco Bay	1962	USS DANIEL BOONE	SSBN629	San Francisco Bay	1963
USS BARB	SSN596	Ingalls	1963	USS JOHN C CALHOUN	SSBN630	Newport News	1964
USS TULLIBEE	SSN597	Electric Boat (Groton)	1960	USS ULYSSES S. GRANT	SSBN631	Electric Boat (Groton)	1964
USS GEORGE WASHINGTON	SSBN598	Electric Boat (Groton)	1959	USS VON STEUBEN	SSBN632	Newport News	1964
USS PATRICK HENRY	SSBN599	Electric Boat (Groton)	1960	USS CASIMIR PULASKI	SSBN633	Electric Boat (Groton)	1964
USS THEODORE ROOSEVELT	SSBN600	San Francisco Bay	1960	USS STONEWALL JACKSON	SSBN634	San Francisco Bay	1964
USS ROBERT E. LEE	SSBN601	Newport News	1960	USS SAM RAYBURN	SSBN635	Newport News	1964
USS ABRAHAM LINCOLN	SSBN602	Portsmouth	1960	USS NATHANAEL GREENE	SSBN636	Portsmouth	1964
USS POLLACK	SSN603	NYSC	1963	USS STURGEON	SSN637	Electric Boat (Groton)	1966
USS HADDO	SSN604	NYSC	1964	USS WHALE	SSN638	GD (Quincy)	1968
USS JACK	SSN605	Portsmouth	1965	USS TAUTOG	SSN639	Ingalls	1968
USS TINOSA	SSN606	Portsmouth	1963	USS BENJAMIN FRANKLIN	SSBN640	Electric Boat (Groton)	1965
USS DACE	SSN607	Ingalls	1963	USS SIMON BOLIVAR	SSBN641	Newport News	1965
USS ETHAN ALLEN	SSBN608	Electric Boat (Groton)	1961	USS KAMEHAMEHA	SSBN642	San Francisco Bay	1965
USS SAM HOUSTON	SSBN609	Newport News	1961	USS GEORGE BANCROFT	SSBN643	Electric Boat (Groton)	1965
USS THOMAS A. EDISON	SSBN610	Electric Boat (Groton)	1961	USS LEWIS AND CLARK	SSBN644	Newport News	1965
USS JOHN MARSHALL	SSBN611	Newport News	1962	USS JAMES K. POLK	SSBN645	Electric Boat (Groton)	1966
USS GUARDFISH	SSN612	NYSC	1966	USS GRAYLING	SSN646	Portsmouth	1969
USS FLASHER	SSN613	Electric Boat (Groton)	1966	USS POGY	SSN647	NYSC/Ingalls	1970
USS GREENLING	SSN614	GD (Quincy)	1967	USS ASPRO	SSN648	Ingalls	1968
USS GATO	SSN615	GD (Quincy)	1967	USS SUNFISH	SSN649	GD (Quincy)	1968

B. Propulsion (Naval) (Continued)

Name (all owned by U. S. Navy)	Designation[61]	Shipbuilder	Start-up	Shut-down
OPERABLE (Continued)				
USS PARGO	SSN650	Electric Boat (Groton)	1967	
USS QUEENFISH	SSN651	Newport News	1966	
USS PUFFER	SSN652	Ingalls	1969	
USS RAY	SSN653	Newport News	1967	
USS GEORGE C. MARSHALL	SSBN654	Newport News	1966	
USS HENRY L. STIMSON	SSBN655	Electric Boat (Groton)	1966	
USS GEORGE WASHINGTON CARVER	SSBN656	Newport News	1966	
USS FRANCIS SCOTT KEY	SSBN657	Electric Boat (Groton)	1966	
USS MARIANO G. VALLEJO	SSBN658	San Francisco Bay	1966	
USS WILL ROGERS	SSBN659	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	Mare Island	1970	
USS BERGALL	SSN667	Electric Boat (Groton)	1969	
USS SPADEFISH	SSN668	Newport News	1969	
USS SEA HORSE	SSN669	Electric Boat (Groton)	1969	
USS FINBACK	SSN670	Newport News	1969	
USS NARWHAL	SSN671	Electric Boat (Groton)	1969	
USS PINTADO	SSN672	Mare Island	1970	
USS FLYING FISH	SSN673	Electric Boat (Groton)	1969	
USS TREPANG	SSN674	Electric Boat (Groton)	1970	
USS BLUEFISH	SSN675	Electric Boat (Groton)	1970	
USS BILLFISH	SSN676	Electric Boat (Groton)	1970	
USS 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				
SAND LANCE	SSN660	Portsmouth		
GUITARRO	SSN665	Mare Island		
DRUM	SSN677	Mare 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		
Submarine	SSN688	Newport News		
NIMITZ (2 reactors)	CVAN68	Newport News		
EISENHOWER (2 reactors)	CVAN69	Newport News		
CALIFORNIA (2 reactors)	DLGN36	Newport News		
South Carolina (2 reactors)	DLGN37	Newport News		
PLANNED				
Submarine	SSN689	Unassigned		
Submarine	SSN690	Unassigned		
Submarine	SSN691	Unassigned		
Submarine	SSN692	Unassigned		
Submarine	SSN693	Unassigned		
Submarine	SSN694	Unassigned		
Guided Missile Frigate (2 reactors)	DLGN38	Unassigned		
Guided Missile Frigate (2 reactors)	DLGN39	Unassigned		
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
SHUT DOWN 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 and/or owner	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 (AEC)	TSR-2	Oak Ridge, Tenn.	ORNL	Light water	100	1960	

A. Test (Continued)

Name and/or owner	Designation	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
SHUT DOWN OR DISMANTLED							
Tower Shielding Reactor No. 1 (AEC)	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

OPERABLE							
Thermal Test Reactor No. 1 (AEC)	TTR-1	Schenectady, N. Y.	KAPL	Graphite	10	1951	
U. S. Naval Postgraduate School (USN)[3]	AGN-201-100	Monterey, Calif.	AGN	Homog. solid	Negligible	1956	
Diamond Ordnance Radiation Facility (Harry Diamond Laboratories, USA)[31]	DORF	Forest Glen, Md.	Gulf E&ES	TRIGA-Mk F	250	1961	
Armed Forces Radiobiology Research Institute (DASA, DOD)[3,31]	AFRRI	Bethesda, Md.	Gulf E&ES	U–Zr hydride	100	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
Army Materials Research Reactor (Army Materials and Mechanics Research Center, USA)[3]	AMRR	Watertown, Mass.	BAC	Pool	5,000	1960	1970
Walter Reed Research Reactor (Walter Reed Army Institute of Research, USA)[3]	WRRR	Washington, D. C.	AI	Homogeneous	50	1962	1970

1. POWER REACTORS[65]

PART IV REACTORS FOR EXPORT

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	1965
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	331,000		1969
Switzerland, NOK Nuclear Electric Generating Station, Unit 1	Beznau (near Baden)	West	Pressurized water	350,000	1,130,000	1969
Japan, Fukushima Station, Unit 1 (Tokyo Electric Power Corp.)	Fatuba, Honshu	GE	Boiling water	460,000		1970
Japan, Mihama Nuclear Power Station, Unit 1 (Kansai Electric Power Co.)	Niu, Honshu	West	Pressurized water	340,000		1970
BEING BUILT						
Japan, Fukushima Station, Unit 2 (Tokyo Electric Power Corp.)	Fatuba, Honshu	GE	Boiling water	784,000		1973
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	460,000		1971
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	306,000		1971
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	564,000		1974
Taiwan, Taiwan Power Co	Chin Shan	GE	Boiling water	604,000		1975
PLANNED						
Italy	Pizcenza/Cremona	GE	Boiling water	783,000		1975
Japan, Oni Nuclear Power Plant, Unit 1 (Kansai Electric Power Co)		West	Pressurized water	1,000,000		1976

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

A. General Irradiation Test (Continued)

Owner	Location	Principal nuclear contractor	Type	Power,[1] kW(t)	Start-up	Shut-down
OPERABLE (Continued)						
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	Bogotá	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	Gulf E&ES	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	Gulf E&ES	TRIGA-Mk II	1,000	1960	
Italy, SORIN Nuclear Center	Saluggia	AMF	Pool	1,000	1959	
Korea, Atomic Energy Commission	Seoul	Gulf E&ES	TRIGA-Mk II	250	1962	
Mexico, National Commission for Nuclear Energy[31]	Salazar	Gulf E&ES	TRIGA-Mk III	1,000	1968	
Pakistan, Atomic Energy Commission	Islamabad	AMF	Pool	5,000	1965	
Philippines, National Science Development Board	Quezon City	GE	Pool	1,000	1963	
Portugal, Nuclear Energy Board	Sacavem	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	
Venezuela Institute for Scientific Research	Caracas	GE	Pool	3,000	1960	
Vietnam, Institute of Nuclear Research	Dalat	Gulf E&ES	TRIGA-Mk II	300	1963	
Yugoslavia, Josef Stefan Nuclear Institute[31]	Podgarica	Gulf E&ES	TRIGA-Mk II	250	1966	
BEING BUILT						
Italy, National Committee for Nuclear Energy	Padua	AMF	Pool	Neglig	1970	
Korea, Atomic Energy Research Institute	Seoul	Gulf E&ES	TRIGA-Mk III	2,000	1971	

SHUT[redacted]WN OR DISMANTLED						
Japan, Atomic Energy Research Institute	Tokai Mura	AI	L-54	50	1957	1969

C. University Research and Teaching

OPERABLE						
Austria, Vienna Polytechnic Institute[31]	Vienna	Gulf E&ES	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	Gulf E&ES	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	Gulf E&ES	TRIGA-Mk I	50	1959	
Finland, Institute of Technology[31]	Helsinki	Gulf E&ES	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	Gulf E&ES	TRIGA Mk II	100	1965	
Germany, Institute for Nuclear Medicine[70]	Heidelberg	Gulf E&ES	TRIGA-Mk I	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	Gulf E&ES	TRIGA-Mk II	300	1965	
Japan, Kinki University	Osaka	ARSS	UTR-10	Negligible	1961	
Japan, Musashi University	Kawasaki City	Gulf E&ES	TRIGA-Mk II	100	1963	
Japan, Rikkyo University	Yokosuka City	Gulf E&ES	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	Negligible	1958	
Switzerland, University of Geneva[73]	Geneva	AGN	201 111	Negligible	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	
BEING BUILT						
Germany, Association for Radiation Research[30 70]	Nuremberg	Gulf E&ES	TRIGA-Mk III	100	1971	
Germany, Medical College of Hanover[70]	Hanover	Gulf E&ES	TRIGA-Mk I	250	1971	

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 IDAHO	Argonne National Laboratory, Idaho Division (AEC), NRTS, Idaho	ANL	2	2
ARMF-I	Advanced Reactivity Measurement Facility (AEC), NRTS, Idaho	INC	2	2
ATF	SNAP Acceptance Test Facility (AEC), Santa Susana, Calif	AI	1	1

1. IDENTIFICATION OF FACILITIES (Continued)

Abbreviation	Name and location of facility	Operator	No. of cells	No. of control panels
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
CFRMF	Coupled Fast Reactor Measurement Facility (AEC), NRTS, Idaho	INC	1	1
ECEL	Epithermal Critical Experiment Laboratory, Santa Susana, Calif.[3]	AI	1	1
ETRC	Engineering Test Reactor Critical Facility (AEC), NRTS, Idaho	INC	1	1
Gulf E&ES	Gulf Energy & Environmental Systems, Inc., 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
LPFT	Low Power Test Facility (AEC), NRTS, Idaho	INC	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
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, SCA	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-IDAHO	Basic fast reactor studies and mock-up for LMFBR	ZPR-3	1955
ANL-IDAHO	Basic fast reactor studies and mock-up for LMFBR	ZPPR	1969
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
CFRMF	Studies of differential cross sections to test calculational methods	CFRMF	1968
ETRC, Test Reactor Area (INC)	ETR physics, core-loading and core-design measurements	ETRC	1957
Gulf E&ES	Accelerator Pulsed Fast Critical Assembly	APFA-III	1967
Gulf E&ES	Core design of thermionic power reactors	ECF	1970
LASL, Kiva I	Cold criticals for Rover reactors	Pewee ZEPO, Nuclear Furnace ZEPO and Honeycomb	1957
LASL, Kiva I	KING Reactor Mock-up	Kinglet	1970
LASL, Kiva III	Cold critical operation of Rover test reactors, environmental chamber, and general-purpose critical assembly	Godiva-IV/Parka	1962
LPTF, Cell 1	NASA Spherical Cavity Reactor Critical Experiment	SCRCE	1969
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

B. Military

Facility	Subject of current experiment or study	Designation	Startup
OPERABLE			
Bettis	Surface-ship physics[77]	SS-CF	1957
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	U(10)-metal cylinder in thick metal reflector	Big ten	1970
RFP	Critical-configuration safety tests	NSF	1965

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.
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 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 operated with an experimental plutonium core at power levels up to 30,000 kW(t). It demonstrated the ability of plutonium fuel elements to perform satisfactorily in a high-flux research or test reactor Operation as a test reactor was terminated on June 30, 1969, and a ^{240}Pu (Phoenix) core run in FY 1970. Facility in standby for possible use by others
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

19 PPD 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
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 shutting down the reactor. An identical ground-test unit, S10FS-3, operated
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, Manila, Philippines, in February–March 1969, and 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 operated 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 Gulf E&ES.
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, and until 1970 it was operated in the former ML-1 reactor area at NRTS. In mid-1970 it was transferred back to UCLRL.
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.

FOOTNOTES (Continued)

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 State University for reactivation 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 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) investiga tions 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

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 (N[redacted] 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 Gulf E&ES 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

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 Bogota Colombia, in the spring of 1963, and in Montevideo, Uruguay, in the fall of 1963 The unit is expected to become operational in 1971

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

[REACTORS FOR EXPORT not included in the index (see pages 24 to 27).]

REACTOR INDEX (Continued)

REACTOR INDEX (Continued)

TECHNICAL PROGRESS REVIEWS

The Division of Technical Information, U. S. Atomic Energy Commission, also publishes three journals on nuclear technology, the Technical Progress Reviews. These journals summarize, evaluate, and reference the progress of development in three important fields. *Nuclear Safety* is a bimonthly journal; the other two are quarterly journals.

Isotopes and Radiation Technology P. S. Baker, A. F. Rupp, and associates, Oak Ridge National Laboratory. Reviews AEC-sponsored projects and related significant worldwide developments in radioisotopes and radiation technology.

Nuclear Safety Wm. B. Cottrell, J. P. Blakely, W. H. Jordan, and associates, Nuclear Safety Information Center, Oak Ridge National Laboratory. Covers topics relevant to the analysis and control of hazards associated with nuclear reactors and with operations involving fissionable materials and the products of nuclear fission.

Reactor Technology Reviews reactor research, development, design practices, operating experience, and aerospace applications, as well as current developments in reactor fuel processing.

Availability

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