



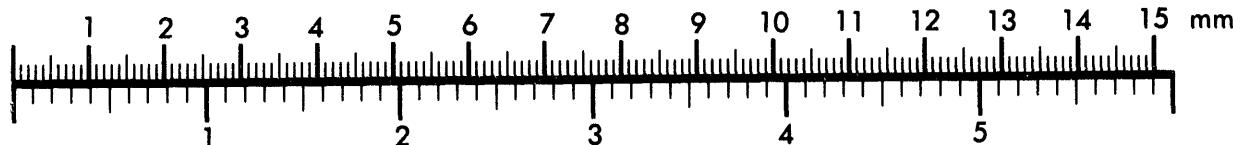
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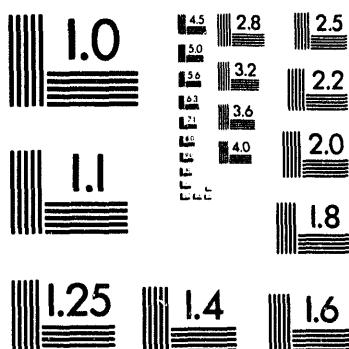
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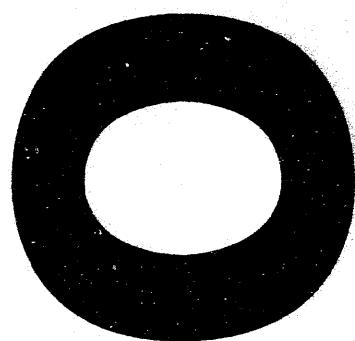
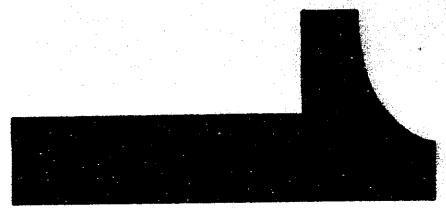
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Nuclear Reactors Built, Being Built, or Planned 1993

Prepared for:

U.S. DEPARTMENT OF ENERGY

Director, Office of Nuclear Energy

Washington, D.C. 20585

Prepared by:

**Office of Scientific and
Technical Information**

Preface

Nuclear Reactors Built, Being Built, or Planned contains unclassified information about facilities built, being built, or planned in the United States for domestic use or export as of December 31, 1993. The Office of Scientific and Technical Information, U.S. Department of Energy, gathers this information annually from Washington headquarters and field offices of DOE; from the U.S. Nuclear Regulatory Commission (NRC); from the U.S. reactor manufacturers who are the principal nuclear contractors for foreign reactor locations; from U.S. and foreign embassies; and from foreign governmental nuclear departments.

The book consists of three divisions, as follows:

- a commercial reactor locator map and tables of the characteristic and statistical data that follow; a table of abbreviations;
- tables of data for reactors operating, being built, or planned; and
- tables of data for reactors that have been shut down permanently or dismantled.

The reactors are subdivided into the following parts: Civilian, Production, Military, Export, and Critical Assembly. *Export reactor* refers to a reactor for which the principal nuclear contractor is a U.S. company—working either independently or in cooperation with a foreign company (Part IV). *Critical assembly* refers to an assembly of fuel and moderator that requires an external source of neutrons to initiate and maintain fission. A critical assembly is used for experimental measurements (Part V).

Various classes of reactors within these parts are defined as follows:

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

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

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

General Irradiation Test Reactor: A reactor having (1) a thermal power level exceeding 10 MW; (2) test loops or experimental facilities within, or in proximity to, the core; and (3) the use

of nuclear radiation for testing the life or performance of reactor components as its major function (Part I, Section 3A; Part IV, Section 2A).

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

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

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

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

Reactors are further grouped according to status:

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

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

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

1. Reactors regulated by NRC
 - when a construction permit is issued.
 - when limited work authorization is issued.
2. Federal Government reactors
 - when ground is broken.
 - when components are ordered.
 - when a construction contract is awarded.

3. Reactors for export
 - when an application for an export license is received by NRC.
 - when reliable information is received relating to the fabrication of reactor components.

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

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

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

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

3. Reactors for export
 - when the plant is officially declared shut down by the owner and taken out of operation permanently.

Table 2 presents a statistical summary of reactors, other than critical assemblies, in each class and status. Shutdown and dismantled reactors are included since such facilities have made significant contributions to reactor technology.

The reactor tables have the following column headings:

- *Location.* The city and state or country where located originally. For a portable facility or one that has been relocated, the most recent location is given.
- *Principal nuclear contractor, operator, designer, ship-builder.* The abbreviations used in this column are spelled out in Table 3, which appears just before the reactor tables.
- *Type.* Entries in this column are based on coolant, moderator, and neutron energy.
- *Power.* MD capacity [MW(e)] is the maximum dependable capacity (net electrical output to grid) for plants having an operating history. Otherwise, it is the design capacity. Licensed power and authorized power are given where appropriate.
- *Designation.* The common name, abbreviation or acronym used for the facility. For the naval reactors, it is the hull number.
- *Date columns.* The initial criticality date, year of operation, and year of shutdown are given as appropriate.

Nuclear Reactors Built, Being Built, or Planned (DOE/OSTI--8200-R57) is sponsored by the DOE Office of Nuclear Energy, LaRue E. Moxley, Program Officer.

The participation and assistance of many individuals, agencies, and companies in providing data and updating the entries in this revision are gratefully acknowledged. Comments and suggestions about this publication are welcome. To ensure that the wide range of information included in this publication will continue to be timely and accurate, please direct any information related to updating the items to William F. Simpson, Jr., Office of Scientific and Technical Information, Scientific and Technical Publications Branch, P.O. Box 62, Oak Ridge, TN 37831; (615) 576-1228. Questions of a technical nature should be addressed to Lamar Cason at the same address.

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REACTORS AND FACILITIES OPERABLE, BEING BUILT, OR PLANNED

Part I. Civilian Reactors (Domestic)

| | |
|---|---|
| 1. Power Reactors | 1 |
| A. Central-Station Electric Power Plants | 1 |
| B. Dual-Purpose Plants (<i>No reactors currently in this category</i>) | 6 |
| C. Propulsion (Maritime) (<i>No reactors currently in this category</i>) | 6 |
| 2. Experimental Power-Reactor Systems | 6 |
| A. Electric-Power Systems | 6 |
| B. Space Nuclear Auxiliary Power (SNAP) (<i>No reactors currently in this category</i>) | 6 |
| C. Space Propulsion (<i>No reactors currently in this category</i>) | 6 |
| 3. Test, Research, and University Reactors | 7 |
| A. General Irradiation Test | 7 |
| B. High-Power Research and Test | 7 |
| C. Safety Research and Test | 7 |
| D. General Research | 8 |
| E. University Research and Teaching | 9 |

Part II. Production Reactors

| | |
|--|----|
| 1. Materials Production | 11 |
| 2. Process Development (<i>No reactors currently in this category</i>) | 11 |

CONTENTS (Continued)

| | |
|--|----|
| Part III. Military Reactors | |
| 1. Defense Power-Reactor Applications | 12 |
| A. Remote Installations (<i>No reactors currently in this category</i>) | 12 |
| B. Propulsion (Naval) | 12 |
| 2. Developmental Power | 15 |
| A. Electric-Power Experiments and Prototypes (<i>No reactors currently in this category</i>) | 15 |
| B. Propulsion Experiments and Prototypes | 15 |
| 3. Test and Research | 15 |
| A. Test (<i>No reactors currently in this category</i>) | 15 |
| B. Research | 16 |

| | |
|---|----|
| Part IV. Export Reactors | |
| 1. Power Reactors | 16 |
| A. Central-Station Electric Power Plants | 16 |
| B. Propulsion (<i>No reactors currently in this category</i>) | 20 |
| 2. Test, Research, and Teaching | 20 |
| A. General Irradiation Test | 20 |
| B. General Research | 20 |
| C. University Research and Teaching | 22 |

| | |
|------------------------------------|----|
| Part V. Critical Assemblies | |
| 1. Civilian | 23 |
| 2. Military | 24 |

REACTORS AND FACILITIES SHUTDOWN OR DISMANTLED

| | |
|---|----|
| Part I. Civilian Reactors (Domestic) | |
| 1. Power Reactors | 25 |
| A. Central-Station Electric Power Plants | 25 |
| B. Dual-Purpose Plants | 26 |
| C. Propulsion (Maritime) | 27 |
| 2. Experimental Power-Reactor Systems | 27 |
| A. Electric-Power Systems | 27 |
| B. Space Nuclear Auxiliary Power (SNAP) | 29 |
| C. Space Propulsion | 30 |
| 3. Test, Research, and University Reactors | 31 |
| A. General Irradiation Test | 31 |
| B. High-Power Research and Test | 32 |
| C. Safety Research and Test | 32 |
| D. General Research | 33 |
| E. University Research and Teaching | 37 |

CONTENTS (Continued)

Part II. Production Reactors

| | |
|-------------------------|----|
| 1. Materials Production | 39 |
| 2. Process Development | 40 |

Part III. Military Reactors

| | |
|--|----|
| 1. Defense Power-Reactor Applications | 40 |
| A. Remote Installations | 40 |
| B. Propulsion (Naval) | 41 |
| 2. Developmental Power | 43 |
| A. Electric-Power Experiments and Prototypes | 43 |
| B. Propulsion Experiments and Prototypes | 43 |
| 3. Test and Research | 43 |
| A. Test | 43 |
| B. Research | 44 |

Part IV. Export Reactors

| | |
|---|----|
| 1. Power Reactors | 44 |
| A. Central-Station Electric Power Plants | 44 |
| B. Propulsion | 44 |
| 2. Test, Research, and Teaching | 45 |
| A. General Irradiation Test (<i>No reactors currently in this category</i>) | 45 |
| B. General Research | 45 |
| C. University Research and Teaching | 45 |

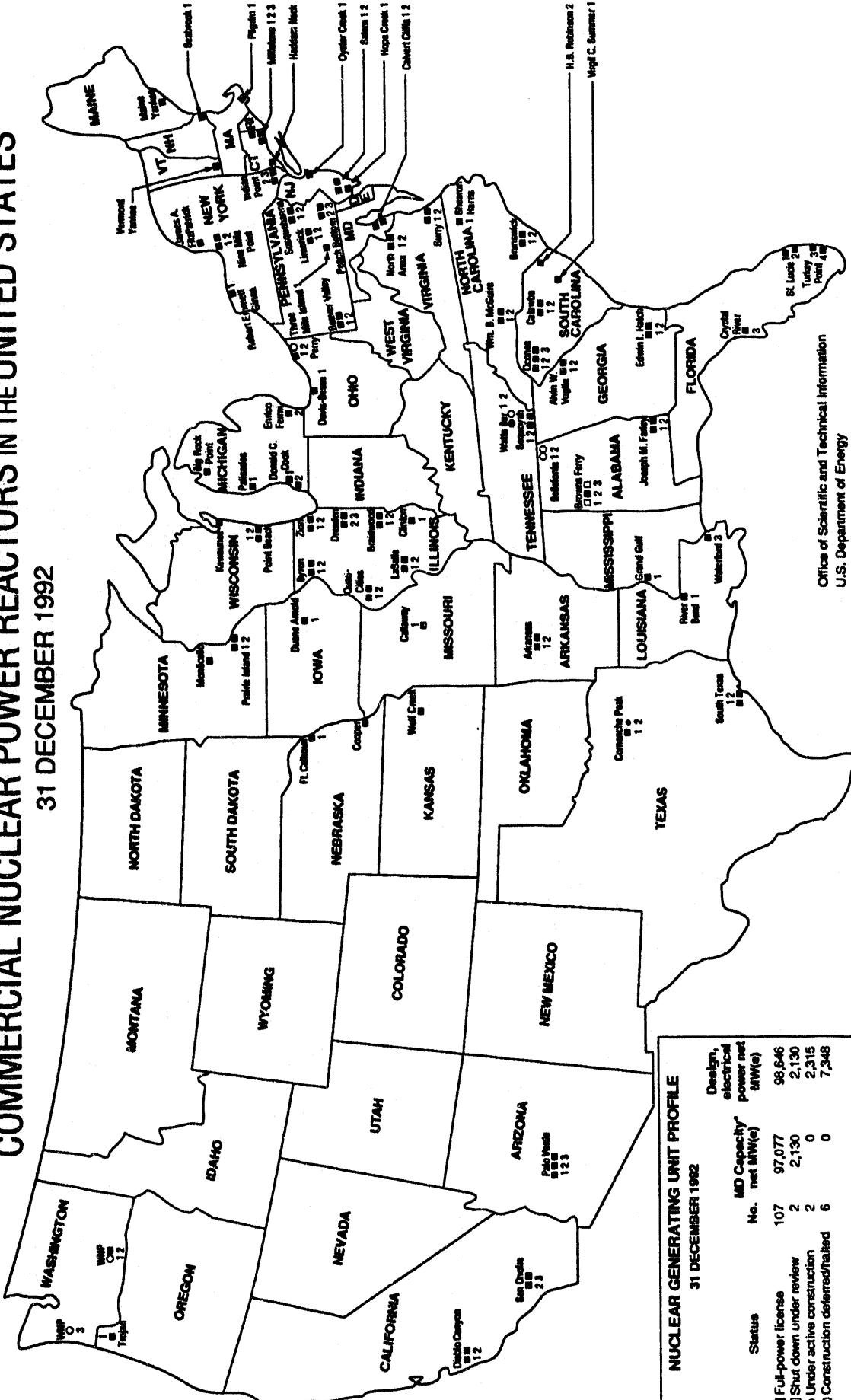
Part V. Critical Assemblies

| | |
|-------------|----|
| 1. Civilian | 46 |
| 2. Military | 46 |

| | |
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| REACTOR INDEX | 47 |
|----------------------|----|

COMMERCIAL NUCLEAR POWER REACTORS IN THE UNITED STATES

31 DECEMBER 1992



NUCLEAR GENERATING UNIT PROFILE
31 DECEMBER 1992

| Status | No. in Service | Net Electrical Power (MW) | Design, Electrical Power (MW) |
|------------------------------|----------------|---------------------------|-------------------------------|
| Full-power license | 107 | 97,077 | 98,646 |
| Shut down under review | 2 | 2,130 | 2,130 |
| Under active construction | 2 | 0 | 2,315 |
| Construction deferred/halted | 6 | 0 | 7,348 |
| Total | 117 | 99,207.0 | 110,439.0 |

*Maximum Dependable Capacity or Design Electrical Rating
DOE/OSTI-8200-RS6 (Suppl.)

From Nuclear Reactors Built, Being Built, or Planned
(DOE/OSTI-8200-RS6)

Because of space limitations, symbols do not reflect precise locations.
DOE/OSTI-8200-RS6 (Suppl.)

TABLE 1

COMMERCIAL NUCLEAR POWER REACTORS IN THE UNITED STATES AS OF 31 DEC 1993

| SITE | PLANT NAME | STATUS | CAPACITY, NET MW(e) | DESIGN ELECTRICAL RATING, NET MW(e) | | LICENSEE | STARTUP |
|--------------------|---|--------|------------------------|--|-------|-------------------------------------|---------|
| | | | | | | | |
| ALABAMA | | | | | | | |
| Decatur | Browns Ferry Nuclear Power Station, Unit 1 | SDUR | | 1,065 | | Tennessee Valley Authority | 73 08 |
| Decatur | Browns Ferry Nuclear Power Station, Unit 2 | FPL | 1,065 | 1,065 | | Tennessee Valley Authority | 74 07 |
| Decatur | Browns Ferry Nuclear Power Station, Unit 3 | SDUR | | 1,065 | | Tennessee Valley Authority | 76 08 |
| Dothan | Joseph M. Farley Nuclear Plant, Unit 1 | FPL | 812 | 829 | | Southern Nuclear Operating Co. | 77 08 |
| Dothan | Joseph M. Farley Nuclear Plant, Unit 2 | FPL | 822 | 829 | | Southern Nuclear Operating Co. | 81 05 |
| Scottsboro | Bellefonte Nuclear Plant, Unit 1 | CDH | | 1,235 | | Tennessee Valley Authority | Indef. |
| Scottsboro | Bellefonte Nuclear Plant, Unit 2 | CDH | | 1,235 | | Tennessee Valley Authority | Indef. |
| | | | | 2,699 | 7,323 | | |
| | Total | | | | | | |
| ARIZONA | | | | | | | |
| Wintersburg | Palo Verde Nuclear Generating Station, Unit 1 | FPL | 1,221 | 1,270 | | Arizona Public Service Co. | 85 05 |
| Wintersburg | Palo Verde Nuclear Generating Station, Unit 2 | FPL | 1,221 | 1,270 | | Arizona Public Service Co. | 86 04 |
| Wintersburg | Palo Verde Nuclear Generating Station, Unit 3 | FPL | 1,304 | 1,270 | | Arizona Public Service Co. | 87 10 |
| | | | | 3,746 | 3,810 | | |
| | Total | | | | | | |
| ARKANSAS | | | | | | | |
| Russellville | Arkansas Nuclear One, Unit 1 | FPL | 836 | 850 | | Entergy Operations Inc. | 74 08 |
| Russellville | Arkansas Nuclear One, Unit 2 | FPL | 858 | 912 | | Entergy Operations Inc. | 78 12 |
| | | | | 1,694 | 1,762 | | |
| | Total | | | | | | |
| CALIFORNIA | | | | | | | |
| Diablo Canyon | Diablo Canyon Nuclear Power Plant, Unit 1 | FPL | 1,073 | 1,086 | | Pacific Gas & Electric Co. | 84 04 |
| Diablo Canyon | Diablo Canyon Nuclear Power Plant, Unit 2 | FPL | 1,087 | 1,119 | | Pacific Gas & Electric Co. | 85 08 |
| San Clemente | San Onofre Nuclear Generating Station, Unit 2 | FPL | 1,070 | 1,070 | | Southern California Edison | 82 07 |
| San Clemente | San Onofre Nuclear Generating Station, Unit 3 | FPL | 1,080 | 1,080 | | Southern California Edison | 83 08 |
| | | | | 4,310 | 4,355 | | |
| | Total | | | | | | |
| CONNECTICUT | | | | | | | |
| Haddam Neck | Haddam Neck Plant | FPL | 560 | 582 | | Connecticut Yankee Atomic Power Co. | 67 07 |
| Waterford | Millstone Nuclear Power Station, Unit 1 | FPL | 641 | 660 | | Northeast Nuclear Energy Co. | 70 10 |
| Waterford | Millstone Nuclear Power Station, Unit 2 | FPL | 873 | 870 | | Northeast Nuclear Energy Co. | 75 10 |
| Waterford | Millstone Nuclear Power Station, Unit 3 | FPL | 1,137 | 1,154 | | Northeast Nuclear Energy Co. | 86 01 |
| | | | | 3,211 | 3,266 | | |
| | Total | | | | | | |

TABLE 1 (Continued)

| SITE | PLANT NAME | STATUS | CAPACITY, NET MW(e) | DESIGN ELECTRICAL RATING, NET MW(e) | LICENSEE | STARTUP |
|------------------|--|--------|------------------------|--|---------------------------------------|---------|
| FLORIDA | | | | | | |
| Florida City | Turkey Point Plant, Unit 3 | FPL | 666 | 693 | Florida Power & Light Co. | 72 10 |
| Florida City | Turkey Point Plant, Unit 4 | FPL | 666 | 693 | Florida Power & Light Co. | 73 06 |
| Fort Pierce | St. Lucie Plant, Unit 1 | FPL | 839 | 830 | Florida Power & Light Co. | 76 04 |
| Fort Pierce | St. Lucie Plant, Unit 2 | FPL | 839 | 830 | Florida Power & Light Co. | 83 06 |
| Red Level | Crystal River Nuclear Plant, Unit 3 | FPL | 821 | 825 | Florida Power Corp. | 77 01 |
| Total | | | 3,831 | 3,871 | | |
| GEORGIA | | | | | | |
| Baxley | Edwin I. Hatch Nuclear Plant, Unit 1 | FPL | 737 | 776 | Georgia Power Co. | 74 09 |
| Baxley | Edwin I. Hatch Nuclear Plant, Unit 2 | FPL | 757 | 784 | Georgia Power Co. | 78 07 |
| Waynesboro | Alvin W. Vogtle Nuclear Plant, Unit 1 | FPL | 1,158 | 1,101 | Georgia Power Co. | 87 03 |
| Waynesboro | Alvin W. Vogtle Nuclear Plant, Unit 2 | FPL | 1,157 | 1,101 | Georgia Power Co. | 89 03 |
| Total | | | 3,809 | 3,762 | | |
| ILLINOIS | | | | | | |
| Braidwood | Braidwood Station, Unit 1 | FPL | 1,120 | 1,120 | Commonwealth Edison Co. | 87 05 |
| Braidwood | Braidwood Station, Unit 2 | FPL | 1,120 | 1,120 | Commonwealth Edison Co. | 88 03 |
| Byron | Byron Station, Unit 1 | FPL | 1,105 | 1,120 | Commonwealth Edison Co. | 85 02 |
| Byron | Byron Station, Unit 2 | FPL | 1,105 | 1,120 | Commonwealth Edison Co. | 87 01 |
| Clinton | Clinton Power Station, Unit 1 | FPL | 930 | 933 | Illinois Power Co. | 87 02 |
| Cordova | Quad-Cities Station, Unit 1 | FPL | 769 | 789 | Commonwealth Edison Co. | 71 10 |
| Cordova | Quad-Cities Station, Unit 2 | FPL | 769 | 789 | Commonwealth Edison Co. | 72 04 |
| Morris | Dresden Nuclear Power Station, Unit 2 | FPL | 772 | 794 | Commonwealth Edison Co. | 70 01 |
| Morris | Dresden Nuclear Power Station, Unit 3 | FPL | 773 | 794 | Commonwealth Edison Co. | 71 01 |
| Seneca | La Salle County Station, Unit 1 | FPL | 1,036 | 1,078 | Commonwealth Edison Co. | 82 06 |
| Seneca | La Salle County Station, Unit 2 | FPL | 1,036 | 1,078 | Commonwealth Edison Co. | 84 03 |
| Zion | Zion Nuclear Plant, Unit 1 | FPL | 1,040 | 1,040 | Commonwealth Edison Co. | 73 06 |
| Zion | Zion Nuclear Plant, Unit 2 | FPL | 1,040 | 1,040 | Commonwealth Edison Co. | 73 12 |
| Total | | | 12,615 | 12,815 | | |
| IOWA | | | | | | |
| Palo | Duane Arnold Energy Center, Unit 1 | FPL | 515 | 538 | Iowa Electric Light & Power Co. | 74 03 |
| Total | | | 515 | 538 | | |
| KANSAS | | | | | | |
| Burlington | Wolf Creek Generating Station | FPL | 1,134 | 1,170 | Wolf Creek Nuclear Operating Corp. | 85 05 |
| Total | | | 1,134 | 1,170 | | |
| LOUISIANA | | | | | | |
| St. Francisville | River Bend Station, Unit 1 | FPL | 936 | 936 | Gulf States Utilities Co. | 85 10 |
| Taft | Waterford Generating Station, Unit 3 | FPL | 1,075 | 1,104 | Entergy Operations Inc. | 85 03 |
| Total | | | 2,011 | 2,040 | | |

TABLE 1 (Continued)

| SITE | PLANT NAME | STATUS | DESIGN ELECTRICAL RATING, NET MW(e) | | LICENSEE | STARTUP |
|---|---|--------|--|-------|-----------------------------------|---------|
| | | | CAPACITY, NET MW(e) | | | |
| MAINE Wiscasset | Maine Yankee Atomic Power Plant | FPL | 860 | 870 | Maine Yankee Atomic Power Co. | 72 10 |
| | Total | | 860 | 870 | | |
| MARYLAND Lusby | Calvert Cliffs Nuclear Power Plant, Unit 1 | FPL | 830 | 845 | Baltimore Gas & Electric Co. | 74 10 |
| | Calvert Cliffs Nuclear Power Plant, Unit 2 | FPL | 830 | 845 | Baltimore Gas & Electric Co. | |
| Total | | | 1,660 | 1,690 | | |
| MASSACHUSETTS Plymouth | Pilgrim Nuclear Power Station, Unit 1 | FPL | 670 | 655 | Boston Edison Co. | 72 06 |
| | Total | | 670 | 655 | | |
| MICHIGAN Big Rock Point Bridgman | Big Rock Point Nuclear Plant | FPL | 67 | 72 | Consumers Power Co. | 62 09 |
| | Donald C. Cook Nuclear Power Plant, Unit 1 | FPL | 1,000 | 1,020 | Indiana and Michigan Electric Co. | |
| Bridgman | Donald C. Cook Nuclear Power Plant, Unit 2 | FPL | 1,060 | 1,090 | Indiana and Michigan Electric Co. | 78 03 |
| Newport | Enrico Fermi Atomic Power Plant, Unit 2 | FPL | 1,085 | 1,116 | Detroit Edison Co. | 85 06 |
| South Haven | Palisades Nuclear Plant, Unit 1 | FPL | 730 | 805 | Consumers Power Co. | 71 05 |
| Total | | | 3,942 | 4,103 | | |
| MINNESOTA Monticello | Monticello Nuclear Generating Plant | FPL | 536 | 545 | Northern States Power Co. | 70 12 |
| | Prairie Island Nuclear Generating Plant, Unit 1 | FPL | 513 | 530 | Northern States Power Co. | |
| Red Wing | Prairie Island Nuclear Generating Plant, Unit 2 | FPL | 512 | 530 | Northern States Power Co. | 74 12 |
| Total | | | 1,561 | 1,605 | | |
| MISSISSIPPI Port Gibson | Grand Gulf Nuclear Station, Unit 1 | FPL | 1,143 | 1,250 | Entergy Operations Inc. | 82 08 |
| | Total | | 1,143 | 1,250 | | |
| MISSOURI Fulton | Callaway Plant, Unit 1 | FPL | 1,120 | 1,171 | Union Electric Co. | 84 10 |
| | Total | | 1,120 | 1,171 | | |
| NEBRASKA Brownville Fort Calhoun | Cooper Nuclear Station | FPL | 764 | 778 | Nebraska Public Power District | 74 02 |
| | Fort Calhoun Station, Unit 1 | FPL | 478 | 478 | Omaha Public Power District | |
| | Total | | 1,242 | 1,256 | | |
| | | | | | | |

TABLE 1 (Continued)

| SITE | PLANT NAME | STATUS | CAPACITY, NET MW(e) | DESIGN ELECTRICAL RATING, NET MW(e) | LICENSEE | STARTUP |
|-----------------------|---|--------|------------------------|--|---|---------|
| NEW HAMPSHIRE | | | | | | |
| Seabrook | Seabrook Nuclear Station, Unit 1 | FPL | 1,150 | 1,148 | North Atlantic Energy Service Corp. | 89 06 |
| Total | | | 1,150 | 1,148 | | |
| NEW JERSEY | | | | | | |
| Salem | Hope Creek Nuclear Generating Station, Unit 1 | FPL | 1,031 | 1,067 | Public Service Electric & Gas Co. | 86 06 |
| Salem | Salem Nuclear Generating Station, Unit 1 | FPL | 1,106 | 1,115 | Public Service Electric & Gas Co. | 76 12 |
| Salem | Salem Nuclear Generating Station, Unit 2 | FPL | 1,106 | 1,115 | Public Service Electric & Gas Co. | 80 08 |
| Toms River | Oyster Creek Nuclear Power Plant, Unit 1 | FPL | 610 | 650 | GPU Nuclear Corp. | 69 05 |
| Total | | | 3,853 | 3,947 | | |
| NEW YORK | | | | | | |
| Buchanan | Indian Point Station, Unit 2 | FPL | 951 | 986 | Consolidated Edison Co. of New York, Inc. | 73 05 |
| Buchanan | Indian Point Station, Unit 3 | FPL | 965 | 965 | New York Power Authority | 76 04 |
| Ontario | Robert Emmett Ginna Nuclear Power Plant, Unit 1 | FPL | 470 | 470 | Rochester Gas & Electric Corp. | 69 11 |
| Scriba | James A. FitzPatrick Nuclear Power Plant | FPL | 780 | 816 | New York Power Authority | 74 11 |
| Scriba | Nine Mile Point Nuclear Station, Unit 1 | FPL | 565 | 625 | Niagara Mohawk Power Corp. | 69 09 |
| Scriba | Nine Mile Point Nuclear Station, Unit 2 | FPL | 994 | 1,062 | Niagara Mohawk Power Corp. | 87 05 |
| Total | | | 4,725 | 4,924 | | |
| NORTH CAROLINA | | | | | | |
| Bonsal | Shearon Harris Nuclear Power Plant, Unit 1 | FPL | 860 | 900 | Carolina Power & Light Co. | 87 01 |
| Cowans Ford Dam | William B. McGuire Nuclear Station, Unit 1 | FPL | 1,129 | 1,180 | Duke Power Co. | 81 08 |
| Cowans Ford Dam | William B. McGuire Nuclear Station, Unit 2 | FPL | 1,129 | 1,180 | Duke Power Co. | 83 05 |
| Southport | Brunswick Steam Electric Plant, Unit 1 | FPL | 767 | 821 | Carolina Power & Light Co. | 76 10 |
| Southport | Brunswick Steam Electric Plant, Unit 2 | FPL | 754 | 821 | Carolina Power & Light Co. | 75 03 |
| Total | | | 4,639 | 4,902 | | |
| OHIO | | | | | | |
| Oak Harbor | Davis-Besse Nuclear Power Station, Unit 1 | FPL | 877 | 906 | Toledo Edison Co. | 77 08 |
| Perry | Perry Nuclear Power Plant, Unit 1 | FPL | 1,166 | 1,191 | Cleveland Electric Illuminating Co. | 86 06 |
| Perry | Perry Nuclear Power Plant, Unit 2 | CDH | | 1,205 | Cleveland Electric Illuminating Co. | Indef. |
| Total | | | 2,043 | 3,302 | | |

TABLE 1 (Continued)

| SITE | PLANT NAME | STATUS | CAPACITY, NET MW(e) | DESIGN ELECTRICAL RATING, NET MW(e) | | LICENSEE | STARTUP |
|-----------------------|--|--------|------------------------|--|--|------------------------------------|---------|
| | | | | | | | |
| PENNSYLVANIA | | | | | | | |
| Berwick | Susquehanna Steam Electric Station, Unit 1 | FPL | 1,040 | 1,050 | | Pennsylvania Power & Light Co. | 82 09 |
| Berwick | Susquehanna Steam Electric Station, Unit 2 | FPL | 1,044 | 1,050 | | Pennsylvania Power & Light Co. | 84 05 |
| Lancaster | Peach Bottom Atomic Power Station, Unit 2 | FPL | 1,055 | 1,065 | | Philadelphia Electric Co. | 73 09 |
| Lancaster | Peach Bottom Atomic Power Station, Unit 3 | FPL | 1,035 | 1,065 | | Philadelphia Electric Co. | 74 08 |
| Middletown | Three Mile Island Nuclear Station, Unit 1 | FPL | 786 | 819 | | GPU Nuclear Corp. | 74 06 |
| Pottstown | Limerick Generating Station, Unit 1 | FPL | 1,055 | 1,055 | | Philadelphia Electric Co. | 84 12 |
| Pottstown | Limerick Generating Station, Unit 2 | FPL | 1,055 | 1,055 | | Philadelphia Electric Co. | 89 08 |
| Shippingport | Beaver Valley Power Station, Unit 1 | FPL | 810 | 835 | | Duquesne Light Co. | 76 05 |
| Shippingport | Beaver Valley Power Station, Unit 2 | FPL | 820 | 836 | | Duquesne Light Co. | 87 08 |
| Total | | | 8,700 | 8,830 | | | |
| SOUTH CAROLINA | | | | | | | |
| Hartsville | H.B. Robinson Plant, Unit 2 | FPL | 683 | 700 | | Carolina Power & Light Co. | 70 09 |
| Jenkinsville | Virgil C. Summer Nuclear Station, Unit 1 | FPL | 885 | 900 | | South Carolina Electric & Gas Co. | 82 10 |
| Lake Wylie | Catawba Nuclear Station, Unit 1 | FPL | 1,129 | 1,145 | | Duke Power Co. | 85 01 |
| Lake Wylie | Catawba Nuclear Station, Unit 2 | FPL | 1,129 | 1,145 | | Duke Power Co. | 86 05 |
| Seneca | Oconee Nuclear Station, Unit 1 | FPL | 846 | 886 | | Duke Power Co. | 73 04 |
| Seneca | Oconee Nuclear Station, Unit 2 | FPL | 846 | 886 | | Duke Power Co. | 73 11 |
| Seneca | Oconee Nuclear Station, Unit 3 | FPL | 846 | 886 | | Duke Power Co. | 74 09 |
| Total | | | 6,364 | 6,548 | | | |
| TENNESSEE | | | | | | | |
| Daisy | Sequoah Nuclear Plant, Unit 1 | FPL | 1,122 | 1,148 | | Tennessee Valley Authority | 80 07 |
| Daisy | Sequoah Nuclear Plant, Unit 2 | FPL | 1,122 | 1,148 | | Tennessee Valley Authority | 81 11 |
| Spring City | Watts Bar Nuclear Plant, Unit 1 | UC | | 1,165 | | Tennessee Valley Authority | |
| Spring City | Watts Bar Nuclear Plant, Unit 2 | CDH | | 1,165 | | Tennessee Valley Authority | Indef. |
| Total | | | 2,244 | 4,626 | | | |
| TEXAS | | | | | | | |
| Bay City | South Texas Project, Unit 1 | FPL | 1,251 | 1,251 | | Houston Lighting & Power Co. | 88 03 |
| Bay City | South Texas Project, Unit 2 | FPL | 1,251 | 1,251 | | Houston Lighting & Power Co. | 89 02 |
| Glen Rose | Comanche Peak Steam Electric Station, Unit 1 | FPL | 1,150 | 1,150 | | Texas Utilities Generating Co. | 90 04 |
| Glen Rose | Comanche Peak Steam Electric Station, Unit 2 | FPL | 1,150 | 1,150 | | Texas Utilities Generating Co. | 93 08 |
| Total | | | 4,802 | 4,802 | | | |
| VERMONT | | | | | | | |
| Vermont | Vermont Yankee Nuclear Power Station | FPL | 504 | 514 | | Vermont Yankee Nuclear Power Corp. | 72 03 |
| Total | | | 504 | 514 | | | |

TABLE 1 (Continued)

| SITE | PLANT NAME | STATUS | CAPACITY, NET MW(e) | DESIGN ELECTRICAL RATING, NET MW(e) | | LICENSEE | STARTUP |
|-------------------|------------------------------------|--------|------------------------|--|-----------|---------------------------------------|---------|
| | | | | NET MW(e) | NET MW(e) | | |
| VIRGINIA | | | | | | | |
| Gravel Neck | Surry Power Station, Unit 1 | FPL | 781 | 788 | | Virginia Electric & Power Co. | 72 07 |
| Gravel Neck | Surry Power Station, Unit 2 | FPL | 781 | 788 | | Virginia Electric & Power Co. | 73 03 |
| Mineral | North Anna Power Station, Unit 1 | FPL | 900 | 907 | | Virginia Electric & Power Co. | 78 04 |
| Mineral | North Anna Power Station, Unit 2 | FPL | 887 | 907 | | Virginia Electric & Power Co. | 80 06 |
| Total | | | 3,349 | 3,390 | | | |
| WASHINGTON | | | | | | | |
| Richland | Washington Nuclear Project, Unit 1 | CDH | | 1,266 | | Washington Public Power Supply System | Indef. |
| Richland | Washington Nuclear Project, Unit 2 | FPL | 1,086 | 1,100 | | Washington Public Power Supply System | 84 01 |
| Satsop | Washington Nuclear Project, Unit 3 | CDH | | 1,242 | | Washington Public Power Supply System | Indef. |
| Total | | | 1,086 | 3,608 | | | |
| WISCONSIN | | | | | | | |
| Carlton | Kewaunee Nuclear Power Plant | FPL | 511 | 535 | | Wisconsin Public Service Corp. | 74 03 |
| Two Creeks | Point Beach Nuclear Plant, Unit 1 | FPL | 485 | 497 | | Wisconsin Electric Power Co. | 70 11 |
| Two Creeks | Point Beach Nuclear Plant, Unit 2 | FPL | 485 | 497 | | Wisconsin Electric Power Co. | 72 05 |
| Total | | | 1,481 | 1,529 | | | |
| U.S. Total | | | 95,713 | 109,382 | | | |

FPL, Full-Power License

UC, Under Active Construction

CDH, Construction Deferred/Halted

SDUR, Shut Down Under Review

TABLE 2
STATISTICAL SUMMARY OF NUCLEAR REACTORS
AS OF 31 DEC 1993

| | Operable | Being built | Planned | Shutdown | Totals |
|---|------------|-------------|----------|------------|------------|
| U.S. REACTORS | | | | | |
| CIVILIAN REACTORS (DOMESTIC) | | | | | |
| Power Reactors | | | | | |
| Central-Station Electric Power Plants | 109 | 7 | | 20 | 136 |
| Dual-Purpose Plants | | | | 1 | 1 |
| Propulsion (Maritime) | | | | 1 | 1 |
| Experimental Power-Reactor Systems | | | | | |
| Electric-Power Systems | 1 | | | 23 | 24 |
| Space Nuclear Auxiliary Power (SNAP) | | | | 9 | 9 |
| Space Propulsion (Rover) | | | | 21 | 21 |
| Test, Research, and University Reactors | | | | | |
| General Irradiation Test | 1 | | 1 | 6 | 8 |
| High-Power Research and Test | 5 | | | 7 | 12 |
| Safety-Research and Test | 1 | | | 10 | 11 |
| General Research | 14 | | 1 | 56 | 71 |
| University Research and Teaching | 34 | | 1 | 31 | 66 |
| PRODUCTION REACTORS | | | | | |
| Materials Production | 1 | | | 12 | 13 |
| Process Development | | | | 5 | 5 |
| MILITARY REACTORS | | | | | |
| Defense Power-Reactor Applications | | | | | |
| Remote Installations | | | | 6 | 6 |
| Propulsion (Naval) | 124 | 15 | | 72 | 211 |
| Developmental Power | | | | | |
| Electric-Power Experiments and Prototypes | | | | 3 | 3 |
| Propulsion Experiments and Prototypes | 5 | | | 10 | 15 |
| Test and Research | | | | | |
| Test | | | | 3 | 3 |
| Research | 4 | | | 6 | 10 |
| EXPORT REACTORS | | | | | |
| POWER REACTORS | | | | | |
| Central-Station Electric Power Plants | 50 | 11 | 4 | 5 | 70 |
| Propulsion | | | | 1 | 1 |
| TEST, RESEARCH, AND TEACHING | | | | | |
| General Irradiation Test | 7 | | | | 7 |
| General Research | 27 | 1 | 1 | 10 | 39 |
| University Research and Teaching | 19 | | | 6 | 25 |
| Totals | 402 | 34 | 8 | 324 | 768 |

TABLE 3

ABBREVIATIONS OF CONTRACTORS, DESIGNERS, SHIPBUILDERS, AND FACILITY OPERATORS

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

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

**REACTORS AND FACILITIES OPERABLE,
BEING BUILT, OR PLANNED**

REACTORS AND FACILITIES OPERABLE, BEING BUILT, OR PLANNED

1. POWER REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

A. Central-Station Electric Power Plants

| Name (licensee) [docket number] | Location | Principal nuclear contractor | Type | Power MD capacity net MW(e) | Power Licensed MW(t) | Initial criticality (yr mo) | Comment |
|---|--------------------|------------------------------|-------------------|-----------------------------|----------------------|-----------------------------|---|
| OPERABLE | | | | | | | |
| Alvin W. Vogtle Nuclear Plant, Unit 1 (Georgia Power Co.) [50-424] | Waynesboro, GA | West. | Pressurized water | 1158.0 | 3565.0 | 87 03 | |
| Alvin W. Vogtle Nuclear Plant, Unit 2 (Georgia Power Co.) [50-425] | Waynesboro, GA | West. | Pressurized water | 1157.0 | 3565.0 | 89 03 | |
| Arkansas Nuclear One, Unit 1 (Entergy Operations Inc.) [50-313] | Russellville, AR | B&W | Pressurized water | 836.0 | 2568.0 | 74 08 | |
| Arkansas Nuclear One, Unit 2 (Entergy Operations Inc.) [50-368] | Russellville, AR | Comb. | Pressurized water | 858.0 | 2815.0 | 78 12 | |
| Beaver Valley Power Station, Unit 1 (Duquesne Light Co., Ohio Edison Co.) [50-334] | Shippingport, PA | West. | Pressurized water | 810.0 | 2652.0 | 76 05 | |
| Beaver Valley Power Station, Unit 2 (Duquesne Light Co.) [50-412] | Shippingport, PA | West. | Pressurized water | 820.0 | 2652.0 | 87 08 | |
| Big Rock Point Nuclear Plant (Consumers Power Co.) [50-155] | Big Rock Point, MI | GE | Boiling water | 67.0 | 240.0 | 62 09 | |
| Braidwood Station, Unit 1 (Commonwealth Edison Co.) [50-456] | Braidwood, IL | West. | Pressurized water | 1120.0 | 3411.0 | 87 05 | |
| Braidwood Station, Unit 2 (Commonwealth Edison Co.) [50-457] | Braidwood, IL | West. | Pressurized water | 1120.0 | 3411.0 | 88 03 | |
| Browns Ferry Nuclear Power Station, Unit 1 (Tennessee Valley Authority) [50-259] | Decatur, AL | GE | Boiling water | 0.0 | 3293.0 | 73 08 | Maximum dependable capacity is zero. Administrative hold to resolve various TVA and NRC concerns 6/1/85. Restarted 5/23/91. |
| Browns Ferry Nuclear Power Station, Unit 2 (Tennessee Valley Authority) [50-260] | Decatur, AL | GE | Boiling water | 1065.0 | 3293.0 | 74 07 | |
| Browns Ferry Nuclear Power Station, Unit 3 (Tennessee Valley Authority) [50-296] | Decatur, AL | GE | Boiling water | 0.0 | 3293.0 | 76 08 | Maximum dependable capacity is zero. Administrative hold to resolve various TVA and NRC concerns 3/3/85. |
| Brunswick Steam Electric Plant, Unit 1 (Carolina Power & Light Co.) [50-325] | Southport, NC | GE | Boiling water | 767.0 | 2436.0 | 76 10 | |
| Brunswick Steam Electric Plant, Unit 2 (Carolina Power & Light Co.) [50-324] | Southport, NC | GE | Boiling water | 754.0 | 2436.0 | 75 03 | |
| Byron Station, Unit 1 (Commonwealth Edison Co.) [50-454] | Byron, IL | West. | Pressurized water | 1105.0 | 3411.0 | 85 02 | |
| Byron Station, Unit 2 (Commonwealth Edison Co.) [50-455] | Byron, IL | West. | Pressurized water | 1105.0 | 3411.0 | 87 01 | |
| Callaway Plant, Unit 1 (Union Electric Co.) [50-483] | Fulton, MO | West. | Pressurized water | 1120.0 | 3565.0 | 84 10 | |
| Calvert Cliffs Nuclear Power Plant, Unit 1 (Baltimore Gas & Electric Co.) [50-317] | Lusby, MD | Comb. | Pressurized water | 830.0 | 2700.0 | 74 10 | |
| Calvert Cliffs Nuclear Power Plant, Unit 2 (Baltimore Gas & Electric Co.) [50-318] | Lusby, MD | Comb. | Pressurized water | 830.0 | 2700.0 | 76 11 | |
| Catawba Nuclear Station, Unit 1 (Duke Power Co.) [50-413] | Lake Wylie, SC | West. | Pressurized water | 1129.0 | 3411.0 | 85 01 | |

1. POWER REACTORS

A. Central-Station Electric Power Plants (Continued)

| Name (licensee) [docket number] | Location | Principal nuclear contractor | Type | Power MD capacity net MW(e) | Power Licensed MW(t) | Initial criticality (yr mo) | Comment |
|---|-------------------|------------------------------|-------------------|-----------------------------|----------------------|-----------------------------|-------------------------------|
| OPERABLE (Continued) | | | | | | | |
| Catawba Nuclear Station, Unit 2 (Duke Power Co.) [50-414] | Lake Wylie, SC | West. | Pressurized water | 1129.0 | 3411.0 | 86 05 | |
| Clinton Power Station, Unit 1 (Illinois Power Co.) [50-461] | Clinton, IL | GE | Boiling water | 930.0 | 2894.0 | 87 02 | |
| Comanche Peak Steam Electric Station, Unit 1 (Texas Utilities Generating Co.) [50-445] | Glen Rose, TX | West. | Pressurized water | 1150.0 | 3411.0 | 90 04 | |
| Comanche Peak Steam Electric Station, Unit 2 (Texas Utilities Generating Co.) [50-446] | Glen Rose, TX | West. | Pressurized water | 1150.0 | 3411.0 | 93 08 | Commercial operation, 8/3/93. |
| Cooper Nuclear Station (Nebraska Public Power District) [50-298] | Brownville, NE | GE | Boiling water | 764.0 | 2381.0 | 74 02 | |
| Crystal River Nuclear Plant, Unit 3 (Florida Power Corp.) [50-302] | Red Level, FL | B&W | Pressurized water | 821.0 | 2544.0 | 77 01 | |
| Davis-Besse Nuclear Power Station, Unit 1 (Toledo Edison Co.) [50-346] | Oak Harbor, OH | B&W | Pressurized water | 877.0 | 2772.0 | 77 08 | |
| Diablo Canyon Nuclear Power Plant, Unit 1 (Pacific Gas & Electric Co.) [50-275] | Diablo Canyon, CA | West. | Pressurized water | 1073.0 | 3338.0 | 84 04 | |
| Diablo Canyon Nuclear Power Plant, Unit 2 (Pacific Gas & Electric Co.) [50-323] | Diablo Canyon, CA | West. | Pressurized water | 1087.0 | 3411.0 | 85 08 | |
| Donald C. Cook Nuclear Power Plant, Unit 1 (Indiana and Michigan Electric Co.) [50-315] | Bridgman, MI | West. | Pressurized water | 1000.0 | 3250.0 | 75 01 | |
| Donald C. Cook Nuclear Power Plant, Unit 2 (Indiana and Michigan Electric Co.) [50-316] | Bridgman, MI | West. | Pressurized water | 1060.0 | 3411.0 | 78 03 | |
| Dresden Nuclear Power Station, Unit 2 (Commonwealth Edison Co.) [50-237] | Morris, IL | GE | Boiling water | 772.0 | 2527.0 | 70 01 | |
| Dresden Nuclear Power Station, Unit 3 (Commonwealth Edison Co.) [50-249] | Morris, IL | GE | Boiling water | 773.0 | 2527.0 | 71 01 | |
| Duane Arnold Energy Center, Unit 1 (Iowa Electric Light & Power Co.) [50-331] | Palo, IA | GE | Boiling water | 515.0 | 1658.0 | 74 03 | |
| Edwin L. Hatch Nuclear Plant, Unit 1 (Georgia Power Co.) [50-321] | Baxley, GA | GE | Boiling water | 737.0 | 2436.0 | 74 09 | |
| Edwin L. Hatch Nuclear Plant, Unit 2 (Georgia Power Co.) [50-366] | Baxley, GA | GE | Boiling water | 757.0 | 2436.0 | 78 07 | |
| Enrico Fermi Atomic Power Plant, Unit 2 (Detroit Edison Co.) [50-341] | Newport, MI | GE | Boiling water | 1085.0 | 3430.0 | 85 06 | |
| Fort Calhoun Station, Unit 1 (Omaha Public Power District) [50-285] | Fort Calhoun, NE | Comb. | Pressurized water | 478.0 | 1500.0 | 73 08 | |
| Grand Gulf Nuclear Station, Unit 1 (Entergy Operations Inc.) [50-416] | Port Gibson, MS | GE | Boiling water | 1143.0 | 3833.0 | 82 08 | |
| H.B. Robinson Plant, Unit 2 (Carolina Power & Light Co.) [50-261] | Hartsville, SC | West. | Pressurized water | 683.0 | 2300.0 | 70 09 | |
| Haddam Neck Plant (Connecticut Yankee Atomic Power Co.) [50-213] | Haddam Neck, CT | West. | Pressurized water | 560.0 | 1825.0 | 67 07 | |
| Hope Creek Nuclear Generating Station, Unit 1 (Public Service Electric & Gas Co.) [50-354] | Salem, NJ | GE | Boiling water | 1031.0 | 3293.0 | 86 06 | |
| Indian Point Station, Unit 2 (Consolidated Edison Co. of New York, Inc.) [50-247] | Buchanan, NY | West. | Pressurized water | 951.0 | 3071.0 | 73 05 | |

PART I CIVILIAN REACTORS (DOMESTIC)

| | | | | | | |
|---|-----------------|-------|-------------------|--------|--------|-------|
| Indian Point Station, Unit 3 (New York Power Authority) [50-286] | Buchanan, NY | West. | Pressurized water | 965.0 | 3025.0 | 76 04 |
| James A. FitzPatrick Nuclear Power Plant (New York Power Authority) [50-333] | Scriba, NY | GE | Boiling water | 780.0 | 2436.0 | 74 11 |
| Joseph M. Farley Nuclear Plant, Unit 1 (Southern Nuclear Operating Co.) [50-348] | Dothan, AL | West. | Pressurized water | 812.0 | 2652.0 | 77 08 |
| Joseph M. Farley Nuclear Plant, Unit 2 (Southern Nuclear Operating Co.) [50-364] | Dothan, AL | West. | Pressurized water | 822.0 | 2652.0 | 81 05 |
| Keweenaw Nuclear Power Plant (Wisconsin Public Service Corp.) [50-305] | Carlton, WI | West. | Pressurized water | 511.0 | 1650.0 | 74 03 |
| La Salle County Station, Unit 1 (Commonwealth Edison Co.) [50-373] | Seneca, IL | GE | Boiling water | 1036.0 | 3323.0 | 82 06 |
| La Salle County Station, Unit 2 (Commonwealth Edison Co.) [50-374] | Seneca, IL | GE | Boiling water | 1036.0 | 3323.0 | 84 03 |
| Limerick Generating Station, Unit 1 (Philadelphia Electric Co.) [50-352] | Pottstown, PA | GE | Boiling water | 1055.0 | 3293.0 | 84 12 |
| Limerick Generating Station, Unit 2 (Philadelphia Electric Co.) [50-353] | Pottstown, PA | GE | Boiling water | 1055.0 | 3293.0 | 89 08 |
| Maine Yankee Atomic Power Plant (Maine Yankee Atomic Power Co.) [50-309] | Wiscasset, ME | Comb. | Pressurized water | 860.0 | 2700.0 | 72 10 |
| Millstone Nuclear Power Station, Unit 1 (Northeast Nuclear Energy Co.) [50-245] | Waterford, CT | GE | Boiling water | 641.0 | 2011.0 | 70 10 |
| Millstone Nuclear Power Station, Unit 2 (Northeast Nuclear Energy Co.) [50-336] | Waterford, CT | Comb. | Pressurized water | 873.0 | 2700.0 | 75 10 |
| Millstone Nuclear Power Station, Unit 3 (Northeast Nuclear Energy Co.) [50-423] | Waterford, CT | West. | Pressurized water | 1137.0 | 3411.0 | 86 01 |
| Monticello Nuclear Generating Plant (Northern States Power Co.) [50-263] | Monticello, MN | GE | Boiling water | 536.0 | 1670.0 | 70 12 |
| Nine Mile Point Nuclear Station, Unit 1 (Niagara Mohawk Power Corp.) [50-220] | Scriba, NY | GE | Boiling water | 565.0 | 1850.0 | 69 09 |
| Nine Mile Point Nuclear Station, Unit 2 (Niagara Mohawk Power Corp.) [50-410] | Scriba, NY | GE | Boiling water | 994.0 | 3323.0 | 87 05 |
| North Anna Power Station, Unit 1 (Virginia Electric & Power Co.) [50-338] | Mineral, VA | West. | Pressurized water | 900.0 | 2893.0 | 78 04 |
| North Anna Power Station, Unit 2 (Virginia Electric & Power Co.) [50-339] | Mineral, VA | West. | Pressurized water | 887.0 | 2893.0 | 80 06 |
| Oconee Nuclear Station, Unit 1 (Duke Power Co.) [50-269] | Seneca, SC | B&W | Pressurized water | 846.0 | 2568.0 | 73 04 |
| Oconee Nuclear Station, Unit 2 (Duke Power Co.) [50-270] | Seneca, SC | B&W | Pressurized water | 846.0 | 2568.0 | 73 11 |
| Oconee Nuclear Station, Unit 3 (Duke Power Co.) [50-287] | Seneca, SC | B&W | Pressurized water | 846.0 | 2568.0 | 74 09 |
| Oyster Creek Nuclear Power Plant, Unit 1 (GPU Nuclear Corp.) [50-219] | Toms River, NJ | GE | Boiling water | 610.0 | 1930.0 | 69 05 |
| Palisades Nuclear Plant, Unit 1 (Consumers Power Co.) [50-255] | South Haven, MI | Comb. | Pressurized water | 730.0 | 2530.0 | 71 05 |
| Palo Verde Nuclear Generating Station, Unit 1 (Arizona Public Service Co.) [50-528] | Wintersburg, AZ | Comb. | Pressurized water | 1221.0 | 3800.0 | 85 05 |
| Palo Verde Nuclear Generating Station, Unit 2 (Arizona Public Service Co.) [50-529] | Wintersburg, AZ | Comb. | Pressurized water | 1221.0 | 3800.0 | 86 04 |
| Palo Verde Nuclear Generating Station, Unit 3 (Arizona Public Service Co.) [50-530] | Wintersburg, AZ | Comb. | Pressurized water | 1304.0 | 3817.0 | 87 10 |
| Peach Bottom Atomic Power Station, Unit 2 (Philadelphia Electric Co.) [50-277] | Lancaster, PA | GE | Boiling water | 1055.0 | 3293.0 | 73 09 |
| Peach Bottom Atomic Power Station, Unit 3 (Philadelphia Electric Co.) [50-278] | Lancaster, PA | GE | Boiling water | 1035.0 | 3293.0 | 74 08 |

1. POWER REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

A. Central-Station Electric Power Plants (Continued)

| Name (licensee) [docket number] | Location | Principal nuclear contractor | Type | Power MD capacity net MW(e) | Power Licensed MW(t) | Initial criticality (yr mo) | Comment |
|---|----------------------|------------------------------|-------------------|-----------------------------|----------------------|-----------------------------|---------|
| OPERABLE (Continued) | | | | | | | |
| Perry Nuclear Power Plant, Unit 1 (Cleveland Electric Illuminating Co.) [50-440] | Perry, OH | GE | Boiling water | 1166.0 | 3579.0 | 86 06 | |
| Pilgrim Nuclear Power Station, Unit 1 (Boston Edison Co.) [50-293] | Plymouth, MA | GE | Boiling water | 670.0 | 1998.0 | 72 06 | |
| Point Beach Nuclear Plant, Unit 1 (Wisconsin Electric Power Co.) [50-266] | Two Creeks, WI | West. | Pressurized water | 485.0 | 1519.0 | 70 11 | |
| Point Beach Nuclear Plant, Unit 2 (Wisconsin Electric Power Co.) [50-301] | Two Creeks, WI | West. | Pressurized water | 485.0 | 1519.0 | 72 05 | |
| Prairie Island Nuclear Generating Plant, Unit 1 (Northern States Power Co.) [50-282] | Red Wing, MN | West. | Pressurized water | 513.0 | 1650.0 | 73 12 | |
| Prairie Island Nuclear Generating Plant, Unit 2 (Northern States Power Co.) [50-306] | Red Wing, MN | West. | Pressurized water | 512.0 | 1650.0 | 74 12 | |
| Quad-Cities Station, Unit 1 (Commonwealth Edison Co.) [50-254] | Cordova, IL | GE | Boiling water | 769.0 | 2511.0 | 71 10 | |
| Quad-Cities Station, Unit 2 (Commonwealth Edison Co.) [50-265] | Cordova, IL | GE | Boiling water | 769.0 | 2511.0 | 72 04 | |
| River Bend Station, Unit 1 (Gulf States Utilities Co.) [50-458] | St. Francisville, LA | GE | Boiling water | 936.0 | 2894.0 | 85 10 | |
| Robert Emmett Ginna Nuclear Power Plant, Unit 1 (Rochester Gas & Electric Corp.) [50-244] | Ontario, NY | West. | Pressurized water | 470.0 | 1520.0 | 69 11 | |
| Salem Nuclear Generating Station, Unit 1 (Public Service Electric & Gas Co.) [50-272] | Salem, NJ | West. | Pressurized water | 1106.0 | 3411.0 | 76 12 | |
| Salem Nuclear Generating Station, Unit 2 (Public Service Electric & Gas Co.) [50-311] | Salem, NJ | West. | Pressurized water | 1106.0 | 3411.0 | 80 08 | |
| San Onofre Nuclear Generating Station, Unit 2 (Southern California Edison) [50-361] | San Clemente, CA | Comb. | Pressurized water | 1070.0 | 3390.0 | 82 07 | |
| San Onofre Nuclear Generating Station, Unit 3 (Southern California Edison) [50-362] | San Clemente, CA | Comb. | Pressurized water | 1080.0 | 3390.0 | 83 08 | |
| Seabrook Nuclear Station, Unit 1 (North Atlantic Energy Service Corp.) [50-443] | Seabrook, NH | West. | Pressurized water | 1150.0 | 3411.0 | 89 06 | |
| Sequoiah Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-327] | Daisy, TN | West. | Pressurized water | 1122.0 | 3411.0 | 80 07 | |
| Sequoiah Nuclear Plant, Unit 2 (Tennessee Valley Authority) [50-328] | Daisy, TN | West. | Pressurized water | 1122.0 | 3411.0 | 81 11 | |
| Shearon Harris Nuclear Power Plant, Unit 1 (Carolina Power & Light Co.) [50-400] | Bonsal, NC | West. | Pressurized water | 860.0 | 2775.0 | 87 01 | |
| South Texas Project, Unit 1 (Houston Lighting & Power Co.) [50-498] | Bay City, TX | West. | Pressurized water | 1251.0 | 3800.0 | 88 03 | |
| South Texas Project, Unit 2 (Houston Lighting & Power Co.) [50-499] | Bay City, TX | West. | Pressurized water | 1251.0 | 3800.0 | 89 02 | |
| St. Lucie Plant, Unit 1 (Florida Power & Light Co.) [50-335] | Fort Pierce, FL | Comb. | Pressurized water | 839.0 | 2700.0 | 76 04 | |
| St. Lucie Plant, Unit 2 (Florida Power & Light Co.) [50-389] | Fort Pierce, FL | Comb. | Pressurized water | 839.0 | 2700.0 | 83 06 | |

| | | | | | | |
|---|---------------------|-------|-------------------|--------|--------|-------|
| Surry Power Station, Unit 1 (Virginia Electric & Power Co.) [50-280] | Gravel Neck, VA | West. | Pressurized water | 781.0 | 2441.0 | 72 07 |
| Surry Power Station, Unit 2 (Virginia Electric & Power Co.) [50-281] | Gravel Neck, VA | West. | Pressurized water | 781.0 | 2441.0 | 73 03 |
| Susquehanna Steam Electric Station, Unit 1 (Pennsylvania Power & Light Co.) [50-387] | Berwick, PA | GE | Boiling water | 1040.0 | 3293.0 | 82 09 |
| Susquehanna Steam Electric Station, Unit 2 (Pennsylvania Power & Light Co.) [50-388] | Berwick, PA | GE | Boiling water | 1044.0 | 3293.0 | 84 05 |
| Three Mile Island Nuclear Station, Unit 1 (GPU Nuclear Corp.) [50-289] | Middletown, PA | B&W | Pressurized water | 786.0 | 2568.0 | 74 06 |
| Turkey Point Plant, Unit 3 (Florida Power & Light Co.) [50-250] | Florida City, FL | West. | Pressurized water | 666.0 | 2200.0 | 72 10 |
| Turkey Point Plant, Unit 4 (Florida Power & Light Co.) [50-251] | Florida City, FL | West. | Pressurized water | 666.0 | 2200.0 | 73 06 |
| Vermont Yankee Nuclear Power Station (Vermont Yankee Nuclear Power Corp.) [50-271] | Vermont, VT | GE | Boiling water | 504.0 | 1593.0 | 72 03 |
| Virgil C. Summer Nuclear Station, Unit 1 (South Carolina Electric & Gas Co.) [50-395] | Jenkinsville, SC | West. | Pressurized water | 885.0 | 2775.0 | 82 10 |
| Washington Nuclear Project, Unit 2 (Washington Public Power Supply System) [50-397] | Richland, WA | GE | Boiling water | 1086.0 | 3323.0 | 84 01 |
| Waterford Generating Station, Unit 3 (Energy Operations Inc.) [50-382] | Taft, LA | Comb. | Pressurized water | 1075.0 | 3390.0 | 85 03 |
| William B. McGuire Nuclear Station, Unit 1 (Duke Power Co.) [50-369] | Cowans Ford Dam, NC | West. | Pressurized water | 1129.0 | 3411.0 | 81 08 |
| William B. McGuire Nuclear Station, Unit 2 (Duke Power Co.) [50-370] | Cowans Ford Dam, NC | West. | Pressurized water | 1129.0 | 3411.0 | 83 05 |
| Wolf Creek Generating Station (Wolf Creek Nuclear Operating Corp.) [50-482] | Burlington, KS | West. | Pressurized water | 1134.0 | 3565.0 | 85 05 |
| Zion Nuclear Plant, Unit 1 (Commonwealth Edison Co.) [50-295] | Zion, IL | West. | Pressurized water | 1040.0 | 3250.0 | 73 06 |
| Zion Nuclear Plant, Unit 2 (Commonwealth Edison Co.) [50-304] | Zion, IL | West. | Pressurized water | 1040.0 | 3250.0 | 73 12 |

| Name (licensee) [docket number] | Location | Principal nuclear contractor | Type | Design, electrical power net MW(e) | Design, thermal power net MW(t) | Estimated initial criticality (yr mo) | Comment |
|---|-----------------|------------------------------|-------------------|------------------------------------|---------------------------------|---------------------------------------|---|
| BEING BUILT | | | | | | | |
| Bellefonte Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-438] | Scottsboro, AL | B&W | Pressurized water | 1235.0 | 3760.0 | Indef. | |
| Bellefonte Nuclear Plant, Unit 2 (Tennessee Valley Authority) [50-439] | Scottsboro, AL | B&W | Pressurized water | 1235.0 | 3760.0 | Indef. | |
| Perry Nuclear Power Plant, Unit 2 (Cleveland Electric Illuminating Co.) [50-441] | Perry, OH | GE | Boiling water | 1205.0 | 3759.0 | Indef. | |
| Washington Nuclear Project, Unit 1 (Washington Public Power Supply System) [50-460] | Richland, WA | B&W | Pressurized water | 1266.0 | 3760.0 | Indef. | |
| Washington Nuclear Project, Unit 3 (Washington Public Power Supply System) [50-508] | Satsop, WA | Comb. | Pressurized water | 1242.0 | 3800.0 | Indef. | |
| Watts Bar Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-390] | Spring City, TN | West. | Pressurized water | 1165.0 | 3411.0 | | No official date has been established by the TVA. |
| Watts Bar Nuclear Plant, Unit 2 (Tennessee Valley Authority) [50-391] | Spring City, TN | West. | Pressurized water | 1165.0 | 3411.0 | Indef. | |

1. POWER REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

B. Dual-Purpose Plants

(No reactors currently in this category)

C. Propulsion (Maritime)

(No reactors currently in this category)

2. EXPERIMENTAL POWER-REACTOR SYSTEMS

A. Electric-Power Systems

| Name (Regulatory agency) Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(T) | Initial criticality (yr mo) | Desig. Type. Principal nucl. contr. | Comment |
|---|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|---|--|
| OPERABLE | | | | | | | | |
| Experimental Breeder Reactor II (DOE), INEL Site, ID | 20,000.0 | 62,500.0 | | | | 61 (0) | EBR-II. Sodium cooled, fast. ANL | The EBR-II reactor is a major irradiation facility for the LMR program; it continues to generate electric power for INEL grid. Tests at EBR-II simulating LOF and LOHS accidents demonstrated that the pool-type design using metallic fuel will safely shut itself down without automatic protection system or operator action. Advanced metal alloy fuel subassemblies have achieved burnups in excess of 180,000 Mwd/T. |

B. Space Nuclear Auxiliary Power (SNAP)

(No reactors currently in this category)

C. Space Propulsion

(No reactors currently in this category)

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

A. General Irradiation Test

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(T) | Initial criticality (yr mo) | Desig. Type. Principal nuci. contr. | Comment |
|---|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|---|------------|
| OPERABLE | | | | | | | | |
| Advanced Test Reactor (DOE). INEL, ID | | | 250,000.0 | | | 66 00 | ATR. Tank. EG&G-ID | Operating. |
| PLANNED | | | | | | | | |
| Los Alamos National Laboratory (DOE). Los Alamos, NM | | | | | | | | |

B. High-Power Research and Test

| | | | | | | | | |
|---|--|----------|--|--|-------|----------------------------------|---|--|
| OPERABLE | | | | | | | | |
| Brookhaven High Flux Beam Research Reactor (DOE). Upton, NY | | 35,400.0 | | | 65 00 | HFBR. Heavy water. BNL | Power derated subject to further safety tests. | |
| Brookhaven Medical Research Reactor (DOE). Upton, NY | | 3,000.0 | | | 59 00 | BMRR. Tank. Daystrom | | |
| High Flux Isotope Reactor (DOE). Oak Ridge, TN | | 85,000.0 | | | 65 00 | HFIR. Tank flux trap. ORNL | Operating. | |
| National Institute of Standards & Technology (NRC). Gaithersburg, MD | | 20,000.0 | | | 67 00 | NIST. Heavy water. NBS-B&R | | |
| Omega West Reactor (DOE). Los Alamos, NM | | 8,000.0 | | | 56 00 | OWR. Tank. LANL | Potential candidate for a U.S. Mo-99 production effort. | |

C. Safety Research and Test

| | | | | | | | | |
|--|--|--|--|--|-------|-------------------------|--------------------------------------|--|
| OPERABLE | | | | | | | | |
| Transient Reactor Test (DOE). INEL Site, ID | | | | | 59 00 | TREAT. Graphite. ANL | Authorized power, n.a. Transient RX. | |

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

D. General Research

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(T) | Initial criticality (yr mo) | Desig. Type. Principal nucl. contr. | Comment |
|--|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|---|--|
| OPERABLE | | | | | | | | |
| Advanced Reactivity Measurement Facility (DOE). INEL Site, ID | | | 100.0 | | | 60 00 | ARMF. Pool. EG&G-ID | Fast and thermal neutron irradiations and reactivity measurements. Reactor currently shut down. |
| Aerotest Operations, Inc. (NRC). San Ramon, CA | | | 250.0 | | | 65 00 | AGNIR. Pool-TRIGA core. GA | |
| Coupled Fast Reactivity Measurement Facility (DOE). INEL Site, ID | | | 100.0 | | | 68 00 | CFRMF. Pool. EG&G-ID | Fast and thermal neutron irradiations, neutron radiography, and thermal and fast fissile assay. Reactor currently shut down. |
| Dow Chemical Co. (NRC). Midland, MI | | | 300.0 | | | 67 00 | TRIGA-Mk I. U-Zr hydride. GA | |
| General Atomics, Advanced TRIGA-Mk F Prototype Reactor (NRC). La Jolla, CA | | | 1,500.0 | | | 60 00 | TRIGA-Mk F. U-Zr hydride. Owner | |
| General Atomics, TRIGA-Mk I Prototype Reactor (NRC). La Jolla, CA | | | 250.0 | | | 58 00 | TRIGA-Mk I. U-Zr hydride. Owner | |
| General Electric Nuclear Test Reactor (NRC). Pleasanton, CA | | | 100.0 | | | 57 00 | NTR. LWR. GE | |
| Neutron Radiography Facility (DOE). INEL, ID | | | 250.0 | | | 77 00 | NRAD. Pool-TRIGA core. ANL | |
| Omaha Veterans Administration Hospital (NRC). Omaha, NE | | | 18.0 | | | 59 00 | TRIGA-Mk I. U-Zr hydride. GA | |
| Rhode Island Nuclear Science Center (NRC). Narragansett, RI | | | 2,000.0 | | | 64 00 | RINSC. Pool. RI | |
| Sandia Pulsed Reactor II (DOE). Kirtland AFB, East, NM | | | 25.0 | | | 67 00 | SPR-II. Bare metal fast burst. Sandia | Pulse, steady state. |
| Sandia Pulsed Reactor III (DOE). Kirtland AFB, East, NM | | | 25.0 | | | 75 00 | SPR-III. Bare metal fast burst. Sandia | Pulse, steady state. |
| SNL Annular Core Research Reactor (DOE). Kirtland AFB, East, NM | | | 2,000.0 | | | 78 00 | ACRR. Pool- UO_2 BeO core. Sandia | Pulse, computer transient steady state. |
| U.S. Geological Survey Laboratory (Department of the Interior) (NRC). Denver, CO | | | 1,000.0 | | | 69 00 | TRIGA-Mk I. U-Zr hydride. GA | |
| PLANNED | | | | | | | | |
| Advanced Neutron Source Reactor (DOE). Oak Ridge, TN | | | 330,000.0 | | | | ANS. D_2O flux trap. ORNL | Advanced conceptual design. In preparation for FY 1995 line item start. |

E. University Research and Teaching

| Name (Regulatory agency), Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(T) | Initial criticality (yr mo) | Desig. Type. Principal nuc. constr. | Comment |
|--|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|---|---|
| OPERABLE | | | | | | | | |
| Arizona, University of (NRC). Tucson, AZ | | | 100.0 | | | 58 00 | TRIGA-Mk I. U-Zr hydride. GA | |
| California, Irvine, University of (NRC). Irvine, CA | | | 250.0 | | | 69 00 | TRIGA-Mk I. U-Zr hydride. GA | |
| Cornell University (NRC). Ithaca, NY | | | 500.0 | | | 62 00 | TRIGA-Mk II. U-Zr hydride. GA | |
| Cornell University Zero Power Reactor (NRC). Ithaca, NY | | | | | | 62 00 | ZPR. Tank. Vitro | Authorized power is negligible. |
| Florida, University of (NRC). Gainesville, FL | | | 100.0 | | | 59 00 | UFTR. Graphite/water. GNEC | |
| Georgia Institute of Technology (NRC). Atlanta, GA | | | 5,000.0 | | | 64 00 | GTR. Heavy water. GNEC | |
| Idaho State University (NRC). Pocatello, ID | | | | | | 67 00 | AGN-201P-103. Homog. solid. AGN | The AGN-201P-103 was operated at San Ramon, CA, by Aerojet-General Corporation from 1957 to 1966. In 4/67 Idaho State University applied for a license to operate the reactor at Pocatello, ID. Authorized power is negligible. |
| Illinois, University of (NRC). Urbana, IL | | | 10.0 | | | 71 00 | LOPRA. U-Zr hydride. GA | |
| Illinois, University of (NRC). Champaign-Urbana, IL | | | 1,500.0 | | | 60 00 | TRIGA-Mk II. U-Zr hydride. GA | |
| Iowa State University (NRC). Ames, IA | | | 10.0 | | | 59 00 | UTR-10. Graphite/water. AS Inc. | |
| Kansas State University (NRC). Manhattan, KS | | | 250.0 | | | 62 00 | TRIGA-Mk II. U-Zr hydride. GA | |
| Manhattan College (NRC). New York, NY | | | | | | 64 00 | MCZPR. Tank. AMF | Authorized power is negligible. |
| Maryland, University of (NRC). College Park, MD | | | 250.0 | | | 74 00 | TRIGA. Tank-TRIGA core. GA | |
| Massachusetts, University of (NRC). Lowell, MA | | | 1,000.0 | | | 74 00 | ULR. Pool. GE | |
| Massachusetts Institute of Technology (NRC). Cambridge, MA | | | 5,000.0 | | | 58 00 | MITR-II. Heavy-water reflected. ACF | |
| Michigan, University of (Ford Nuclear Reactor) (NRC). Ann Arbor, MI | | | 2,000.0 | | | 57 00 | FNR. Pool. B&W | |
| Missouri at Rolla, University of (NRC). Rolla, MO | | | 200.0 | | | 61 00 | UMR-R. Pool. CW | |
| Missouri, University of (NRC). Columbia, MO | | | 10,000.0 | | | 66 00 | MURR. Tank. Owner-IC | |

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

E. University Research and Teaching (Continued)

| Name (Regulatory agency) Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Desig. Type. Principal nucl. contr. | Comment |
|--|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|---|--|
| OPERABLE (Continued) | | | | | | | | |
| New Mexico, University of (NRC). Albuquerque, NM | | | | | | 66 00 | AGN-201M-112. Homog. Solid. AGN | AGN-201M-112 was operated at the University of California, Berkeley, beginning in 1957. The University of New Mexico filed an application in 4/66 for transfer and reconstruction of the reactor at a site on its campus. The reactor achieved criticality at the University of New Mexico on 10/7/66. Authorized power is negligible. |
| North Carolina State University (NRC). Raleigh, NC | | | 1,000.0 | | | 72 00 | PULSTAR. Pool. AMF | |
| Ohio State University (NRC). Columbus, OH | | | 500.0 | | | 61 00 | OSURR. Pool. Lockheed | |
| Oregon State University (NRC). Corvallis, OR | | | 1,000.0 | | | 67 00 | OSTR. U-Zr hydride. GA | |
| Penn State TRIGA Reactor (NRC). University Park, PA | | | 1,000.0 | | | 65 00 | PSTR. Pool-TRIGA core. GA | |
| Purdue University (NRC). West Lafayette, IN | | | 1.0 | | | 62 00 | PUR-1. Pool. Lockheed | |
| Reed College (NRC). Portland, OR | | | 250.0 | | | 68 00 | TRIGA-Mk I. U-Zr hydride. GA | Owner: Pennsylvania State University. From 1955 to 1965, the Penn State reactor was operated as a 200-kW(t) pool-type reactor fueled with MTR-type elements. |
| State University of New York (NRC). Buffalo, NY | | | 2,000.0 | | | 61 00 | PULSTAR. Pool. AMF | Owner: Buffalo Materials Research Center. |
| Texas A&M University (NRC). College Station, TX | | | | | | 57 00 | AGN-201M-106. Homog. solid. AGN | Authorized power is negligible. |
| Texas A&M University (NRC). College Station, TX | | | 1,000.0 | | | 61 00 | TRIGA. U-Zr hydride. GA | The Nuclear Science Center Reactor at Texas A&M University has been modified for 1000-kW steady-state operation with a TRIGA-type core. Power level was 100 kW prior to modification in 1968. |
| Texas at Austin, University of (NRC). Austin, TX | | | 1,100.0 | | | 89 00 | TRIGA-Mk II. U-Zr hydride. GA | |
| Utah, University of (NRC). Salt Lake City, UT | | | 250.0 | | | 75 00 | TRIGA-Mk I. U-Zr hydride. GA | |
| Virginia, University of (NRC). Charlottesville, VA | | | 2,000.0 | | | 60 00 | UVAR. Pool. Owner-B&W | |

| | | | | |
|---|---------|-------|------------------------------------|---|
| Washington State University (NRC). Pullman, WA | 1,000.0 | 67 00 | WSTR. Pool-TRIGA core. GA | 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(l). |
| Wisconsin, University of (NRC). Madison, WI | 1,000.0 | 67 00 | TRIGA. Pool-TRIGA core. GA | The University of Wisconsin reactor has been modified for 1000-kW steady-state operation with a TRIGA-type core. Power level was 250 kW prior to modification in 1967. |
| Worcester Polytechnic Institute (NRC). Worcester, MA | 10.0 | 59 00 | No Desg. Pool. GE | |
| PLANNED | | | | |
| Arkansas Tech University (NRC). Russellville, AR | 250.0 | | TRIGA-Mk I. U-Zr hydride. GA | The Arkansas Tech University reactor contains parts from the TRIGA reactor dismantled at Michigan State University. |

1. MATERIALS PRODUCTION

PART II PRODUCTION REACTORS

| Name (Owner) | Location | Nuclear designer | Type | Authorized power | Startup | Comment |
|-----------------------------|-----------|---------------------|-------------|---------------------|---------------|---------|
| OPERABLE K Reactor (DOE) | Aiken, SC | Du Pont | Heavy water | 54 00 | Cold standby. | |

2. PROCESS DEVELOPMENT

(No reactors currently in this category)

1. DEFENSE POWER-REACTOR APPLICATIONS

PART III MILITARY REACTORS

A. Remote Installations

(No reactors currently in this category)

B. Propulsion (Naval)

The abbreviations used here are defined as follows:

SSN, Submarine (Nuclear Propulsion)

SSBN, Fleet Ballistic Missile Submarine (Nuclear Propulsion)

CGN, Guided Missile Cruiser (Nuclear Propulsion)

CVN, Aircraft Carrier (Nuclear Propulsion)

| Name (all owned by U.S. Navy) | Designation | Shipbuilder | Startup | Comment |
|-------------------------------|-------------|------------------------|---------|--|
| OPERABLE | | | | |
| USS GATO | SSN615 | GD (Quincy) | 67 00 | |
| DANIEL WEBSTER | ex-SSBN626 | Electric Boat (Groton) | 64 00 | Removed from sea-going service and converted to training platform. |
| USS STONEWALL JACKSON | SSBN634 | Mare Island | 64 00 | |
| SAM RAYBURN | ex-SSBN635 | Newport News | 64 00 | Removed from sea-going service and converted to training platform. |
| USS STURGEON | SSN637 | Electric Boat (Groton) | 66 00 | |
| USS WHALE | SSN638 | GD (Quincy) | 68 00 | |
| USS TAUTOG | SSN639 | Ingalls | 68 00 | |
| USS SIMON BOLIVAR | SSBN641 | Newport News | 65 00 | |
| USS KAMEHAMEHA | SSN642 | Mare Island | 65 00 | |
| USS JAMES K. POLK | SSN645 | Electric Boat (Groton) | 66 00 | |
| USS GRAYLING | SSN646 | Portsmouth | 69 00 | |
| USS POGY | SSN647 | NYSC/Ingalls | 70 00 | |
| USS ASPRO | SSN648 | Ingalls | 68 00 | |
| USS SUNFISH | SSN649 | GD (Quincy) | 68 00 | |
| USS PARGO | SSN650 | Electric Boat (Groton) | 67 00 | |
| USS PUFFER | SSN652 | Ingalls | 69 00 | |
| USS MARIANO G. VALLEJO | SSBN658 | Mare Island | 66 00 | |
| USS SAND LANCE | SSN660 | Portsmouth | 71 00 | |
| USS GURNARD | SSN662 | Mare Island | 68 00 | |
| USS HAMMERHEAD | SSN663 | Newport News | 67 00 | |
| USS HAWKBILL | SSN666 | Mare Island | 70 00 | |
| USS BERGALL | SSN667 | Electric Boat (Groton) | 69 00 | |
| USS SPADEFISH | SSN668 | Newport News | 69 00 | |
| USS SEA HORSE | SSN669 | Electric Boat (Groton) | 69 00 | |
| USS FINBACK | SSN670 | Newport News | 69 00 | |
| USS NARWHAL | SSN671 | Electric Boat (Groton) | 69 00 | |
| USS PINTADO | SSN672 | Mare Island | 70 00 | |
| USS FLYING FISH | SSN673 | Electric Boat (Groton) | 69 00 | |
| USS TREPANG | SSN674 | Electric Boat (Groton) | 70 00 | |
| USS BLUEFISH | SSN675 | Electric Boat (Groton) | 70 00 | |
| USS BILLFISH | SSN676 | Electric Boat (Groton) | 70 00 | |
| USS DRUM | SSN677 | Mare Island | 71 00 | |
| USS ARCHERFISH | SSN678 | Electric Boat (Groton) | 71 00 | |
| USS SILVERSIDES | SSN679 | Electric Boat (Groton) | 71 00 | |
| USS WILLIAM H. BATES | SSN680 | Ingalls | 72 00 | |
| USS BATFISH | SSN681 | Electric Boat (Groton) | 72 00 | |

| | | | |
|----------------------------|---------|------------------------|-------|
| USS TUNNY | SSN682 | Ingalls | 73 00 |
| USS PARCHE | SSN683 | Ingalls | 74 00 |
| USS CAVALLA | SSN684 | Electric Boat (Groton) | 72 00 |
| USS L. MENDELL RIVERS | SSN686 | Newport News | 74 00 |
| USS LOS ANGELES | SSN688 | Newport News | 76 00 |
| USS PHILADELPHIA | SSN690 | Electric Boat (Groton) | 76 00 |
| USS MEMPHIS | SSN691 | Newport News | 77 00 |
| USS OMAHA | SSN692 | Electric Boat (Groton) | 77 00 |
| USS CINCINNATI | SSN693 | Newport News | 77 00 |
| USS GROTON | SSN694 | Electric Boat (Groton) | 77 00 |
| USS BIRMINGHAM | SSN695 | Newport News | 78 00 |
| USS NEW YORK CITY | SSN696 | Electric Boat (Groton) | 78 00 |
| USS INDIANAPOLIS | SSN697 | Electric Boat (Groton) | 79 00 |
| USS BREMERTON | SSN698 | Electric Boat (Groton) | 79 00 |
| USS JACKSONVILLE | SSN699 | Electric Boat (Groton) | 79 00 |
| USS DALLAS | SSN700 | Electric Boat (Groton) | 80 00 |
| USS LA JOLLA | SSN701 | Electric Boat (Groton) | 81 00 |
| USS PHOENIX | SSN702 | Electric Boat (Groton) | 81 00 |
| USS BOSTON | SSN703 | Electric Boat (Groton) | 81 00 |
| USS BALTIMORE | SSN704 | Electric Boat (Groton) | 82 00 |
| USS CITY OF CORPUS CHRISTI | SSN705 | Electric Boat (Groton) | 82 00 |
| USS ALBUQUERQUE | SSN706 | Electric Boat (Groton) | 82 00 |
| USS PORTSMOUTH | SSN707 | Electric Boat (Groton) | 83 00 |
| USS MINNEAPOLIS-SAINT PAUL | SSN708 | Electric Boat (Groton) | 83 00 |
| USS HYMAN G. RICKOVER | SSN709 | Electric Boat (Groton) | 84 00 |
| USS AUGUSTA | SSN710 | Electric Boat (Groton) | 84 00 |
| USS SAN FRANCISCO | SSN711 | Newport News | 80 00 |
| USS ATLANTA | SSN712 | Newport News | 81 00 |
| USS HOUSTON | SSN713 | Newport News | 82 00 |
| USS NORFOLK | SSN714 | Newport News | 83 00 |
| USS BUFFALO | SSN715 | Newport News | 83 00 |
| USS SALT LAKE CITY | SSN716 | Newport News | 83 00 |
| USS OLYMPIA | SSN717 | Newport News | 84 00 |
| USS HONOLULU | SSN718 | Newport News | 85 00 |
| USS PROVIDENCE | SSN719 | Electric Boat (Groton) | 85 00 |
| USS PITTSBURGH | SSN720 | Electric Boat (Groton) | 85 00 |
| USS CHICAGO | SSN721 | Newport News | 86 00 |
| USS KEY WEST | SSN722 | Newport News | 87 00 |
| USS OKLAHOMA CITY | SSN723 | Newport News | 87 00 |
| USS LOUISVILLE | SSN724 | Electric Boat (Groton) | 86 00 |
| USS HELENA | SSN725 | Electric Boat (Groton) | 87 00 |
| USS OHIO | SSBN726 | Electric Boat (Groton) | 80 00 |
| USS MICHIGAN | SSBN727 | Electric Boat (Groton) | 82 00 |
| USS FLORIDA | SSBN728 | Electric Boat (Groton) | 82 00 |
| USS GEORGIA | SSBN729 | Electric Boat (Groton) | 83 00 |
| USS HENRY M. JACKSON | SSBN730 | Electric Boat (Groton) | 84 00 |
| USS ALABAMA | SSBN731 | Electric Boat (Groton) | 84 00 |
| USS ALASKA | SSBN732 | Electric Boat (Groton) | 85 00 |
| USS NEVADA | SSBN733 | Electric Boat (Groton) | 86 00 |
| USS TENNESSEE | SSBN734 | Electric Boat (Groton) | 87 00 |
| USS PENNSYLVANIA | SSBN735 | Electric Boat (Groton) | 88 00 |
| USS WEST VIRGINIA | SSBN736 | Electric Boat (Groton) | 90 00 |
| USS KENTUCKY | SSBN737 | Electric Boat (Groton) | 90 00 |
| USS MARYLAND | SSBN738 | Electric Boat (Groton) | 91 00 |
| USS NEBRASKA | SSBN739 | Electric Boat (Groton) | 93 00 |
| USS NEWPORT NEWS | SSN750 | Newport News | 88 00 |

1. DEFENSE POWER-REACTOR APPLICATIONS

PART III MILITARY REACTORS

B. Propulsion (Naval) (Continued)

| Name (all owned by U.S. Navy) | Designation | Shipbuilder | Startup |
|--|-------------|------------------------|---------|
| USS SAN JUAN | SSN751 | Electric Boat (Groton) | 87 00 |
| USS PASADENA | SSN752 | Electric Boat (Groton) | 88 00 |
| USS ALBANY | SSN753 | Newport News | 89 00 |
| USS TOPEKA | SSN754 | Electric Boat (Groton) | 89 00 |
| USS MIAMI | SSN755 | Electric Boat (Groton) | 89 00 |
| USS SCRANTON | SSN756 | Newport News | 90 00 |
| USS ALEXANDRIA | SSN757 | Electric Boat (Groton) | 91 00 |
| USS ASHEVILLE | SSN758 | Newport News | 91 00 |
| USS JEFFERSON CITY | SSN759 | Newport News | 91 00 |
| USS ANNAPOLIS | SSN760 | Electric Boat (Groton) | 91 00 |
| USS SPRINGFIELD | SSN761 | Electric Boat (Groton) | 92 00 |
| USS COLUMBUS | SSN762 | Electric Boat (Groton) | 93 00 |
| USS SANTA FE | SSN763 | Electric Boat (Groton) | 93 00 |
| USS BOISE | SSN764 | Newport News | 92 00 |
| USS MONTPELIER | SSN765 | Newport News | 92 00 |
| USS HAMPTON | SSN767 | Newport News | 93 00 |
| USS LONG BEACH (2 reactors) | CGN9 | Bethlehem | 61 00 |
| USS BAINBRIDGE (2 reactors) | CGN25 | Bethlehem | 62 00 |
| USS TRUXTUN (2 reactors) | CGN35 | NYSC | 67 00 |
| USS CALIFORNIA (2 reactors) | CGN36 | Newport News | 73 00 |
| USS SOUTH CAROLINA (2 reactors) | CGN37 | Newport News | 74 00 |
| USS VIRGINIA (2 reactors) | CGN38 | Newport News | 76 00 |
| USS MISSISSIPPI (2 reactors) | CGN40 | Newport News | 78 00 |
| USS ARKANSAS (2 reactors) | CGN41 | Newport News | 80 00 |
| USS ENTERPRISE (8 reactors) | CVN65 | Newport News | 60 00 |
| USS NIMITZ (2 reactors) | CVN68 | Newport News | 74 00 |
| USS DWIGHT D. EISENHOWER (2 reactors) | CVN69 | Newport News | 77 00 |
| USS CARL VINSON (2 reactors) | CVN70 | Newport News | 81 00 |
| USS THEODORE ROOSEVELT (2 reactors) | CVN71 | Newport News | 86 00 |
| USS ABRAHAM LINCOLN (2 reactors) | CVN72 | Newport News | 89 00 |
| USS GEORGE WASHINGTON (2 reactors) | CVN73 | Newport News | 92 00 |
| Deep Submergence Research Vehicle | NR-1 | Electric Boat (Groton) | 69 00 |

| BEING BUILT | |
|--------------------|---------|
| RHODE ISLAND | SSBN740 |
| MAINE | SSBN741 |
| WYOMING | SSBN742 |
| LOUISIANA | SSBN743 |
| CHARLOTTE | SSN766 |
| HARTFORD | SSN768 |
| TOLEDO | SSN769 |
| TUCSON | SSN770 |
| COLUMBIA | SSN771 |
| GREENVILLE | SSN772 |
| CHEYENNE | SSN773 |
| SEAWOLF | SSN21 |
| CONNECTICUT | SSN22 |
| JOHN C. STENNIS | CVN74 |
| UNITED STATES | CVN75 |

2. DEVELOPMENTAL POWER

A. Electric-Power Experiments and Prototypes

(No reactors currently in this category)

B. Propulsion Experiments and Prototypes

| Name (Owner). Location | Designation | Power capacity net kW(e) | Authorized power kW(t) | Initial criticality (yr mo) | Reactor type. Principal nuclear contractor | Comment |
|--|-------------|--------------------------------|---------------------------|--------------------------------|---|---------|
| OPERABLE | | | | | | |
| Destroyer Reactor Prototype (DOE). West Milton, NY | D1G | | | 62 00 | Pressurized water. GE | |
| Large Ship Reactor Prototype (2 reactors) (DOE). INEL Site, ID | A1W | | | 58 00 | Pressurized water. West. | |
| Modifications and Additions to Reactor Facility (DOE). West Milton, NY | MARF | | | 76 00 | Pressurized water. GE | |
| Natural Circulation Test Plant (DOE). INEL Site, ID | SSG | | | 65 00 | Pressurized water. West. | |
| Trident Prototype. (DOE) West Milton, NY | S8G | | | 78 00 | Pressurized water. GE | |

3. TEST AND RESEARCH

A. Test

(No reactors currently in this category)

3. TEST AND RESEARCH

PART III MILITARY REACTORS

B. Research

| Name (Owner). Location | Designation | Power capacity net kW(e) | Authorized power kW(t) | Initial criticality (yr mo) | Reactor type. Principal nuclear contractor | Comment |
|---|-------------|--------------------------|------------------------|-----------------------------|--|---------|
| OPERABLE | | | | | | |
| Armed Forces Radiobiology Research Institute, DNA (DOD). Regulated by NRC. Bethesda, MD | AFRRI | | 1,100.0 | 62 00 | TRIGA-Mk F. GA | |
| Army Pulse Radiation Facility, Test and Evaluation Command (USA). Aberdeen, MD | APRF | | 10.0 | 68 07 | Bare, fast, prompt burst. UNC | |
| Fast Burst Reactor Facility, Test and Evaluation Command (USA). White Sands, NM | FBRF | | 10.0 | 64 08 | Bare, fast, prompt burst. Kaman | |
| Stationary Neutron Radiography System (USAF). McClellan AFB, CA | SNRS-1 | | 1,300.0 | 91 01 | TRIGA Mod Mark II. GA | |

1. POWER REACTORS

PART IV EXPORT REACTORS

A. Central-Station Electric Power Plants

| Reactor Name (Owner). Location | NRC export license No. and date | Principal nuclear contractor. Reactor type | Power design net MW(e) | Power MW(t) | Authorized power kW(t) | Initial criticality (yr mo) | Comment |
|---|---------------------------------|--|------------------------|-------------|------------------------|-----------------------------|---------|
| OPERABLE | | | | | | | |
| Belgium, Doel, Unit 1. Antwerp | | West. Pressurized water | 392.0 | 1,192.0 | | 75 00 | |
| Belgium, Doel, Unit 2. Antwerp | | West. Pressurized water | 392.0 | 1,192.0 | | 75 00 | |
| Belgium, Doel, Unit 4. Antwerp | | West. Pressurized water | 1,006.0 | 3,000.0 | | 85 00 | |
| Belgium, Tihange, Unit 1. Huy, Liege | | West./Fram. ACEC | 870.0 | 2,660.0 | | 75 00 | |
| Belgium, Tihange, Unit 3. Huy, Liege | | West. Pressurized water | 1,006.0 | 3,000.0 | | 85 00 | |
| Brazil, Angra 1, Central Electricia de Furnas. Angra dos Reis | XR-081 04/13/73 | West. Pressurized water | 626.0 | 1,882.0 | | 85 00 | |
| Germany, Mulheim-Kaerlich (Rheinisch-Westfaelisches Elektrizitaetswerk AG). | XR-118 06/28/77 | Pressurized water | 1,200.0 | | | 87 10 | |

| | | | | | | |
|---|--------------------|---|---------|---------|-------|---|
| India, Tarapur Nuclear Power Station, Unit 1. Tarapur (near Bombay) | XR-054 07/07/64 | GE Boiling water | 200.0 | 707.0 | 69 00 | |
| India, Tarapur Nuclear Power Station, Unit 2. Tarapur (near Bombay) | XR-054 07/07/64 | GE Boiling water | 200.0 | 707.0 | 69 00 | |
| Italy, Cesno Nuclear Station (ENEL). Piacenza/Cremona | XR-077 04/02/71 | GE Boiling water | 840.0 | 2,651.0 | 79 00 | Shut down and monitored since 1/87. |
| Italy, Trino Vercellese (ENEL). Trino, Piedmont | XR-044 06/14/62 | West. Pressurized water | 247.0 | 870.0 | 65 00 | Shut down and monitored since 1/87. |
| Japan, Fukushima Dai-ichi Power Station, Unit 1 (Tokyo Electric Power Co.). Okuma, Fukushima Pref. | XR-066 08/15/67 | GE. Boiling water | 439.0 | 1,380.0 | 70 10 | |
| Japan, Fukushima Dai-ichi Power Station, Unit 2 (Tokyo Electric Power Co.). Okuma, Fukushima Pref. | XR-072 04/22/70 | GE, Toshiba. Boiling water | 760.0 | 2,381.0 | 73 05 | |
| Japan, Fukushima Dai-ichi Power Station, Unit 6 (Tokyo Electric Power Co.). Futaba, Fukushima Pref. | XR-084 05/25/73 | GE, Toshiba. Boiling water | 1,067.0 | 3,293.0 | 79 03 | |
| Japan, Mihama Power Station, Unit 1 (Kansai Electric Power Co.). Mihama, Fukui Pref. | XR-067 08/15/67 | West., Mitsubishi. Pressurized water | 320.0 | 1,031.0 | 70 07 | |
| Japan, Ohi Power Station, Unit 1 (Kansai Electric Power Co.). Ohi, Fukui Pref. | XR-082 04/17/73 | West., Mitsubishi. Pressurized water | 1,120.0 | 3,423.0 | 77 12 | |
| Japan, Ohi Power Station, Unit 2 (Kansai Electric Power Co.). Ohi, Fukui Pref. | XR-082 04/17/73 | West., Mitsubishi. Pressurized water | 1,120.0 | 3,423.0 | 78 09 | |
| Japan, Takahama Power Station, Unit 1 (Kansai Electric Power Co.). Takahama, Fukui Pref. | XR-079 07/23/71 | West., Mitsubishi. Pressurized water | 780.0 | 2,440.0 | 74 03 | |
| Japan, Tokai No. 2 Power Station (Japan Atomic Power Co.). Tokai-Mura, Ibaraki Pref. | XR-085 05/25/73 | GE, Hitachi, Shimizu. Boiling water | 1,080.0 | 3,293.0 | 78 01 | |
| Japan, Tsuruga Power Station, Unit 1 (Japan Atomic Power Co.). Tsuruga, Fukui Pref. | XR-065 06/22/67 | GE. Boiling water | 341.0 | 1,064.0 | 69 10 | |
| Korea, Kori-1 (Korea Electric Power Co.). Kori (near Pusan) | XR-083 05/04/73 | West. Pressurized water | 564.0 | 1,729.0 | 78 00 | Formerly, Korea, Unit 1. |
| Korea, Kori-2 (Korea Electric Power Co.). Kori (near Pusan) | XR-119 04/08/77 | West. Pressurized water | 605.0 | 1,876.0 | 83 00 | Formerly, Korea, Unit 2. |
| Korea, Kori-3 (Korea Electric Power Co.). Kori (near Pusan) | XR-131 10/04/78 | West. Pressurized water | 900.0 | 2,775.0 | 85 00 | Formerly, Korea, Unit 5. |
| Korea, Kori-4 (Korea Electric Power Co.). Kori (near Pusan) | XR-131 10/04/78 | West. Pressurized water | 900.0 | 2,775.0 | 85 00 | Formerly, Korea, Unit 6. |
| Korea, Yonggwang-1 (Korea Electric Power Co.). Gyema (near Kwang Ju) | XR-133 09/22/80 | West. Pressurized water | 900.0 | 2,775.0 | 86 00 | Formerly, Korea, Unit 7. |
| Korea, Yonggwang-2 (Korea Electric Power Co.). Gyema (near Kwang Ju) | XR-133 09/22/80 | West. Pressurized water | 900.0 | 2,777.0 | 87 00 | Formerly, Korea, Unit 8. |
| Mexico, Laguna Verde Station, Unit 1. Laguna Verde | XR-098 05/17/74 | GE. Boiling water | 654.0 | 1,931.0 | 88 11 | Commercial operation, 7/29/90. |
| Netherlands, Dodewaard (GKN). Dodewaard, Betuwe | XR-058 09/15/65 | GE. Boiling water | 55.0 | 183.0 | 68 06 | In 1984 the reactor's nominal power was raised from 163.4 MW(t) to 183 MW(t). The reactor's cooling is by natural circulation only. |

1. POWER REACTORS

PART IV EXPORT REACTORS

A. Central-Station Electric Power Plants (Continued)

| Reactor Name (Owner). Location | NRC export license No. and date | Principal nuclear contractor. Reactor type | Power design net MW(e) | Power MW(t) | Authorized power kW(t) | Initial criticality (yr mo) | Comment |
|---|---------------------------------|--|------------------------|-------------|------------------------|-----------------------------|---------|
| Slovenia, Krsko (Nuklearna Elektrosveta Krsko). Krsko | XR-107 05/20/77 | West. Pressurized water | 615.0 | 1,882.0 | | 83 00 | |
| Spain, Almaraz, Unit 1 (Union Electrica, S.A.). Almaraz | XR-088 07/12/73 | West. Pressurized water | 902.0 | 2,696.0 | | 81 00 | |
| Spain, Almaraz, Unit 2 (Union Electrica, S.A.). Almaraz | XR-088 07/12/73 | West. Pressurized water | 902.0 | 2,696.0 | | 83 00 | |
| Spain, Asco, Unit 1 (FECSA). Asco | XR-090 07/12/73 | West. Pressurized water | 902.0 | 2,696.0 | | 83 00 | |
| Spain, Asco, Unit 2 (FECSA). Asco | XR-099 06/22/76 | West. Pressurized water | 902.0 | 2,696.0 | | 85 00 | |
| Spain, Cofrentes, Unit 1 (Hidroelectrica Espanola S.A.). Cofrentes | XR-097 06/10/74 | GE. Boiling water | 975.0 | 2,900.0 | | 84 00 | |
| Spain, José Cabrera (Union Electrica, S.A.). Zonita de los Canes | XR-059 10/22/65 | West. Pressurized water | 160.0 | 510.0 | | 69 00 | |
| Spain, Santa María de Garoña (Centrales Nucleares del Norte, S.A., Nucleonar). S.M. Garoña Burgos | XR-064 06/09/67 | GE. Boiling water | 440.0 | 1,381.0 | | 70 00 | |
| Spain, Vandellós, Unit 2 (ENHER). Tarragona | XR-122 09/13/87 | West. Pressurized water | 920.0 | 2,785.0 | | 88 03 | |
| Sweden, Ringhals, Unit 2 (Vattenfall AB). Väro (near Göteborg) | XR-069 05/09/69 | West. Pressurized water | 870.0 | 2,660.0 | | 74 10 | |
| Sweden, Ringhals, Unit 3 (Vattenfall AB). Väro (near Göteborg) | XR-095 02/02/74 | West. Pressurized water | 915.0 | 2,783.0 | | 81 00 | |
| Sweden, Ringhals, Unit 4 (Vattenfall AB). Väro (near Göteborg) | XR-103 10/21/75 | West. Pressurized water | 915.0 | 2,783.0 | | 83 00 | |
| Switzerland, Beznau, Unit 1 (Nordostschweizerische Kraftwerke AG). Döttingen | XR-063 02/03/67 | West. Pressurized water | 350.0 | 1,130.0 | | 69 00 | |
| Switzerland, Beznau, Unit 2 (Nordostschweizerische Kraftwerke AG). Döttingen | XR-070 11/05/69 | West. Pressurized water | 350.0 | 1,130.0 | | 71 00 | |
| Switzerland, Leibstadt (Kernkraftwerk Leibstadt). Leibstadt | XR-104 12/31/75 | GE. Boiling water | 990.0 | 3,138.0 | | 84 00 | |
| Switzerland, Mühleberg (Bernische Kraftwerke AG). Mühleberg (near Bern) | XR-068 10/04/67 | GE. Boiling water | 320.0 | 997.0 | | 72 00 | |
| Taiwan, Chinshan, Unit 1 (Taiwan Power Co.). Shihmen | XR-080 07/24/72 | GE. Boiling water | 604.0 | 1,775.0 | | 77 10 | |
| Taiwan, Chinshan, Unit 2 (Taiwan Power Co.). Shihmen | XR-080 07/24/72 | GE. Boiling water | 604.0 | 1,775.0 | | 78 11 | |

| | | | | | | |
|--|--------------------|--|---------|---------|--------|--|
| Taiwan, Kuo Sheng, Unit 1 (Taiwan Power Co.), Wanli Hsiang | XR-096 04/17/74 | GE. Boiling water | 948.0 | 2,894.0 | 81 02 | |
| Taiwan, Kuo Sheng, Unit 2 (Taiwan Power Co.), Wanli Hsiang | XR-096 04/17/74 | GE. Boiling water | 948.0 | 2,894.0 | 82 03 | |
| Taiwan, Maanshan, Unit 1 (Taiwan Power Co.), Heng-chun | XR-113 06/08/79 | West. Pressurized water | 890.0 | 2,785.0 | 84 03 | |
| Taiwan, Maanshan, Unit 2 (Taiwan Power Co.), Heng-chun | XR-113 06/08/79 | West. Pressurized water | 890.0 | 2,785.0 | 85 02 | |
| BEING BUILT | | | | | | |
| England, Sizewell B (Central Electricity Generating Board), Suffolk | XR-148 07/30/86 | West. Pressurized water | 1,188.0 | 3,425.0 | 94 00 | |
| Japan, Kashiwazaki-Kariwa, Unit 6 (Tokyo Electric Power Co.), Kashiwazaki, Niigata Pref. | | GE, Toshiba. Advanced boiling water | 1,356.0 | 3,930.0 | 96 12 | Gross design power. As of 3/31/94, 58.4% completed. |
| Japan, Kashiwazaki-Kariwa, Unit 7 (Tokyo Electric Power Co.), Kashiwazaki, Niigata Pref. | | GE, Hitachi. Advanced boiling water | 1,356.0 | 3,930.0 | 97 07 | Gross design power. As of 3/31/94, 32.2% completed. |
| Korea, Yonggwang-3 (Korea Electric Power Co.), Gyemas (near Kwang Ju) | XR-150 04/16/87 | Comb. Pressurized water | 900.0 | | 95 00 | Also, Korea, Unit 11. |
| Korea, Yonggwang-4 (Korea Electric Power Co.), Gyemas (near Kwang Ju) | XR-150 04/16/87 | Comb. Pressurized water | 900.0 | | 96 00 | Also, Korea, Unit 12. |
| Mexico, Laguna Verde Station, Unit 2, Laguna Verde | XR-102 10/24/74 | GE. Boiling water | 654.0 | 1,931.0 | 95 12 | As of 3/31/94, 98% completed. |
| Philippines, Republic of the, Philippine Nuclear Power Plant, Unit 1 (National Power Corp.), Morong, Batangas Prov., Luzon | XR-120 05/06/80 | West. Pressurized water | 620.0 | 1,876.0 | Indef. | |
| Spain, Lemoniz, Unit 1, Lemoniz | XR-089 07/12/73 | West. Pressurized water | 900.0 | 2,696.0 | Indef. | |
| Spain, Lemoniz, Unit 2, Lemoniz | XR-089 07/12/73 | West. Pressurized water | 900.0 | 2,696.0 | Indef. | |
| Spain, Valdecaballeros, Unit 1 (HE: Sevillana de Electricidad), Valdecaballeros, Badajos | XR-110 05/05/77 | GE. Boiling water | 975.0 | 2,894.0 | Indef. | |
| Spain, Valdecaballeros, Unit 2 (HE: Sevillana de Electricidad), Valdecaballeros, Badajos | XR-110 05/05/77 | GE. Boiling water | 975.0 | 2,894.0 | Indef. | |
| PLANNED | | | | | | |
| Korea, Ulchin 3 (Korea Electric Power Co.), Kuongsangbuk-do | XR-153 04/06/92 | Comb. Pressurized water | 950.0 | 2825.0 | | |
| Korea, Ulchin 4 (Korea Electric Power Co.), Kuongsangbuk-do | XR-153 04/06/92 | Comb. Pressurized water | 950.0 | 2825.0 | | |
| Taiwan, Unit 7 (Taiwan Power Co.), Lungmen | 02/17/81 | | 1,000.0 | | 99 00 | The NRC has issued three licenses to vendors for this reactor: XR-134, -135, and -136. Only the vendor who wins the contract will be allowed to use its license. |
| Taiwan, Unit 8 (Taiwan Power Co.), Lungmen | 02/17/81 | | 1,000.0 | | | The NRC has issued three licenses to vendors for this reactor: XR-134, -135, and -136. Only the vendor who wins the contract will be allowed to use its license. |

1. POWER REACTORS (Continued)

PART IV EXPORT REACTORS

B. Propulsion

(No reactors currently in this category)

2. TEST, RESEARCH, AND TEACHING

A. General Irradiation Test

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

B. General Research

| | | | | | | | |
|---|--------------------|-----------------|--|--|---------|-------|--|
| OPERABLE | | | | | | | |
| Australia, Moata (Atomic Energy Commission). Lucas Heights, New South Wales | XR-039 09/12/60 | AR. UTR-10 | | | 15.0 | 61 00 | |
| Austria, Astra (Seibersdorf Research Center). Seibersdorf | XR-023 09/03/58 | AMF. Pool | | | 5,000.0 | 60 00 | |
| Bangladesh (Institute of Nuclear Technology). Dhaka | XR-126 10/05/82 | GA. TRIGA-Mk II | | | 3,000.0 | 86 00 | |
| Colombia, IAN-R1 (Institute of Nuclear Affairs). Bogotá | XR-053 05/27/54 | Lockheed. Pool | | | 20.0 | 65 00 | |
| Denmark, DR-1 (Risø National Laboratory). Risø | XR-005 04/04/57 | AI. L-55 | | | 2.0 | 57 00 | |
| England (Imperial Chemical Industries). Billingham, Teesside | XR-074 03/23/71 | GA. TRIGA-Mk I | | | 250.0 | 71 00 | |

| | | | | | |
|--|--------------------|-----------------------|----------|-------|--|
| Greece, Democritos (Atomic Energy Commission). Athens | XR-014 09/25/57 | AMF. Pool | 1,000.0 | 61 00 | |
| Indonesia (National Atomic Energy Agency). Bandung | XR-048 | GA. TRIGA-Mk II | 1,000.0 | 64 00 | |
| Indonesia (National Atomic Energy Agency). Yogyakarta | | GA. TRIGA-Mk II | 250.0 | 79 00 | |
| | | | | | Additional NRC export license No. and date: XR-078, 5/20/71. |
| | | | | | GA: This reactor was designed and built by BATAN (National Atomic Energy Agency of Indonesia). The design was based on the design of TRIGA Mark II reactor, with maximum power level of 250 kW. In 1979 this reactor reached initial criticality at 50 kW. After the upgrading and replacing of some components, it reached a power level of 100 kW in 1984. BATAN: The original Bandung TRIGA-Mark II reactor was commissioned at 250 kW(t) in 1964. It was upgraded and reached a power level of 1000 kW(t) in 1971. |
| Israel (Atomic Energy Commission). Nahal Soreq | XR-021 06/12/58 | AMF. Pool | 5,000.0 | 60 00 | |
| Italy (Italian Agency for New Technology, Energy and the Environment). Rome | XR-026 01/08/59 | GA. TRIGA-Mk II | 1,000.0 | 60 00 | |
| Jamaica (Kingston). Kingston | XR-094 06/03/75 | Research reactor | | | Design power: 10W. |
| Korea (Advanced Energy Research Institute). Seoul | XR-027 05/21/59 | GA. TRIGA-Mk II | 250.0 | 62 00 | |
| Korea (Advanced Energy Research Institute). Seoul | XR-073 05/15/70 | GA. TRIGA-Mk III | 2,000.0 | 72 00 | |
| Malaysia (Tun Ismail Atomic Research Centre). Kuala Lumpur | XR-125 02/20/81 | GA. TRIGA-Mk II | 1,000.0 | 82 00 | |
| Mexico (National Commission for Nuclear Energy). Salazar | XR-057 02/12/65 | GA. TRIGA-Mk III | 1,000.0 | 68 00 | |
| Pakistan, PARR (Atomic Energy Commission). Islamabad | XR-046 04/23/62 | AMF. Pool | 5,000.0 | 65 00 | |
| Philippines, Republic of the, PRR-1 (Philippine Nuclear Research Institute). Quezon City | XR-034 11/16/59 | GA. TRIGA Conversion | 3,000.0 | 88 03 | The original Philippine Research Reactor (PRR-1) was designed and built by GE and was commissioned as a 1 MW reactor in 1963. The reactor was shut down in 1/85 for extensive upgrading and has now become a TRIGA Conversion. It has a power level of 3 MW and reached criticality on 3/11/88. |
| Portugal, RP-1 (National Laboratory of Engineering and Industrial Technology). Sacavém | XR-013 09/13/57 | AMF. Pool | 1,000.0 | 61 00 | |
| Slovenia (Josef Stefan Nuclear Institute). Ljubljana | XR-055 01/30/64 | GA. TRIGA-Mk II | 500.0 | 66 00 | |
| Spain (Nuclear Energy Board-JEN). Madrid | XR-010 07/29/57 | GE. Pool | 3,000.0 | 58 00 | |
| Switzerland (Paul Scherrer Institute). Wuerenlingen | | ORNL. Pool Conversion | 10,000.0 | 57 00 | This is the 1955 Geneva conference reactor rebuilt with increased power. |
| Thailand, TRR-1 (Office of Atomic Energy for Peace). Bangkok | XR-112 05/05/77 | GA. TRIGA-Mk III | 2,000.0 | 77 11 | The Thai research reactor, TRR-1, built by Curtiss-Wright and started up in 1962, originally operated at 1000 kW(t). In 6/75 the TRR-1 was shut down for conversion to TRR-1/M1, a TRIGA-Mark III system adapted for pool installation. The TRR-1/M1, with a power level of 2000 kW(t)/2000 MW pulsing was commissioned 11/77. |
| Turkey (Atomic Energy Commission). Istanbul | XR-030 09/04/59 | AMF. Pool | 1,000.0 | 62 00 | |
| Turkey (Technical University of Istanbul). Istanbul | XR-108 03/24/76 | GA. TRIGA-Mk II | 250.0 | 79 00 | |

2. TEST, RESEARCH, AND TEACHING

B. General Research (Continued)

| Reactor Name (Owner), Location | NRC export license No. and date | Principal nuclear contractor, Reactor type | Power design net MW(e) | Power MW(t) | Authorized power kW(t) | Initial criticality (yr sec) | Comment |
|--|---------------------------------|--|------------------------|-------------|------------------------|------------------------------|--|
| OPERABLE (Continued) | | | | | | | |
| Venezuela (Institute for Scientific Research), Caracas | XR-018 01/16/58 | GE, Pool | | | 3,000.0 | 60 00 | |
| Zaire (Regional Center for Nuclear Studies), Kinshasa | | | | | | | |
| | | GA. TRIGA-Mk II | | | 1,000.0 | 59 00 | This TRIGA reactor operated at the 1958 International Conference in Geneva prior to shipment to the University of Lovanium in 6/59. It is the first reactor to be operated on the African continent. |
| BEING BUILT | | | | | | | |
| Morocco (C.E.N., Maismora), Rabat | XR-158 10/25/91 | GA. TRIGA-Mk II | | | 3,000.0 | | Originally planned as TRIGA-Mk I, reactor was upgraded to TRIGA-Mk II. Original export license was not used. |
| PLANNED | | | | | | | |
| Albania, Tirana | XR-154 Pending | GA. TRIGA-Mk I | | | 250.0 | | Export license application dated 10/9/90. |

C. University Research and Teaching

| | | | | | | | |
|--|--------------------|-----------------|--|--|---------|-------|---|
| OPERABLE | | | | | | | |
| Austria (Vienna Polytechnic Institute), Vienna | XR-035 11/24/59 | GA. TRIGA-Mk II | | | 250.0 | 62 00 | |
| Brazil (University of Minas Gerais), Belo Horizonte | XR-028 08/03/59 | GA. TRIGA-Mk I | | | 100.0 | 60 00 | |
| Brazil (University of São Paulo), São Paulo | XR-002 01/22/57 | B&W, Pool | | | 5,000.0 | 57 00 | |
| Canada (McMaster University), Hamilton, Ontario | XR-011 08/27/57 | AMF, Pool | | | 5,000.0 | 59 00 | |
| China, Republic of (National Tsing-Hua University), Hsinchu | XR-020 06/05/58 | GE, Pool | | | 1,000.0 | 62 00 | |
| Finland (Institute of Technology), Helsinki | XR-040 04/05/61 | GA. TRIGA-Mk II | | | 250.0 | 62 00 | |
| Germany (Institute for Nuclear Medicine), Heidelberg | XR-060 02/14/66 | GA. TRIGA-Mk I | | | 250.0 | 66 00 | This TRIGA-Mk I reactor was installed in 1966. In 1977, the reactor was shut down, dismantled, and moved to another building. After this move, it was started up again in 1978. This operation was referred to as "TRIGA I" and "TRIGA II." |
| Germany (Johannes Gutenberg University of Mainz), Mainz | XR-050 04/11/64 | GA. TRIGA-Mk II | | | 100.0 | 65 00 | |
| Germany (Medical College of Hanover), Hanover | XR-076 02/26/71 | GA. TRIGA-Mk I | | | 250.0 | 73 00 | |
| Germany, FRM Garching (Technical University of Munich), Munich | XR-004 03/15/57 | AMF, Pool | | | 4,000.0 | 57 00 | |

| | | | | | |
|---|--------------------|-----------------|---------|-------|---|
| Iran (University of Tehran). Tehran | XR-029 08/05/59 | AMF. Pool | 5,000.0 | 67 00 | Fuel supplier being sought. |
| Italy (University of Palermo). Palermo | XR-025 01/07/59 | AGN. 201-110 | | 60 00 | Negligible power. Shut down for renewal of operating license. |
| Italy (University of Pavia). Pavia | XR-056 03/12/65 | GA. TRIGA-Mk II | 250.0 | 65 00 | Shut down for renewal of operating license. |
| Japan (Kinki University). Higashi-Osaka | XR-041 04/18/61 | AR. UTR-10 | | 61 11 | Negligible power. |
| Japan (Meiji College of Technology). Kawasaki | XR-037 07/08/60 | GA. TRIGA-Mk II | 100.0 | 63 01 | |
| Japan (Rikkyo University). Yokohama | XR-038 07/08/60 | GA. TRIGA-Mk II | 100.0 | 61 12 | |
| Korea (University of Kyung Hee). Seoul | XR-105 11/18/75 | AGN. 201 | | 82 00 | Negligible power. |
| Netherlands (Delft Technical University). Delft | XR-003 02/01/57 | AMF. Pool (MTR) | 2,000.0 | 63 04 | The Netherlands research reactor was originally operated at the Amsterdam International Exhibition in 6/57; major portions of the exhibition reactor system were used to fabricate the present reactor. |
| Switzerland (University of Basel). Basel | | AGN. 211-100 | | 58 00 | This reactor was operated in the International Science Section of the Brussels Information Exhibition, 4/15/58 to 10/1/58, prior to transfer to the University of Basel. Negligible power. |

1. CIVILIAN

PART V CRITICAL ASSEMBLIES

| Facility (Regulatory Agency) | Designation | Location | Equipment | | | | Comment |
|---|-------------|----------------------|--------------|----------------------------|----------------|-----------------------------|---|
| | | | No. of cells | No. of control panels/room | Abbreviation | Initial criticality (yr mo) | |
| Advanced Test Reactor Critical Facility (DOE) | ATRC | INEL Site, ID | 1 | 1 | ATRC | 64 00 | ATR physics, core-loading and core-design measurements. |
| Argonne National Laboratory, Idaho Division (DOE) | ZPPR | INEL Site, ID | 1 | 1 | ANL-IDAHO | 69 00 | To be shut down FY95. |
| Los Alamos National Laboratory (DOE) | Big Ten | Los Alamos, NM | | | LANL, Kiva II | 72 00 | U(10)-metal cylinder in thick metal reflector. |
| Los Alamos National Laboratory (DOE) | Comet | Los Alamos, NM | | | LANL, Kiva II | 52 00 | Critical-configuration safety and neutronic tests. |
| Los Alamos National Laboratory (DOE) | Flatop | Los Alamos, NM | 1 | 1 | LANL, Kiva II | 57 00 | Spherical metal cores in thick metal reflector. |
| Los Alamos National Laboratory (DOE) | Godiva-IV | Los Alamos, NM | | | LANL, Kiva III | 67 00 | Fast neutron irradiation, pulse capability. |
| Los Alamos National Laboratory (DOE) | Honeycomb | Los Alamos, NM | | | LANL, Kiva I | 56 00 | Flexible split table assembly. |
| Los Alamos National Laboratory (DOE) | Mars | Los Alamos, NM | | | LANL, Kiva I | 74 00 | Vertical table assembly machine. |
| Los Alamos National Laboratory (DOE) | Planet | Los Alamos, NM | | | LANL, Kiva II | 84 00 | Vertical table assembly. |
| Los Alamos National Laboratory (DOE) | SHEBA | Los Alamos, NM | 2 | 1 | LANL, Kiva I | 80 00 | Solution high energy burst assembly. |
| Los Alamos National Laboratory (DOE) | SKUA | Los Alamos, NM | 1 | 1 | LANL, Kiva III | 78 00 | Fast neutron irradiation, pulse capability. |
| Rensselaer Polytechnic Institute (NRC) | Troy | Troy, NY | 1 | 1 | Rensselaer | 66 00 | Critical experiment assembly. |
| SNL Critical Assembly (DOE) | CX | Kirtland AFB Eau, NM | | | Sandia | 89 09 | Space power neutronics. |

2. MILITARY

Facility (Regulatory Agency)
Knolls Atomic Power Laboratory (DOE)
Nuclear Safety Facility, Rocky Flats Plant
(DOE)
Nuclear Safety Facility, Rocky Flats Plant
(DOE)

PART V CRITICAL ASSEMBLIES

| Equipment | | No. of cells | No. of control panels/room | Initial criticality (yr mo) | Comment |
|---|-----------------|--------------|----------------------------|-----------------------------|----------------|
| Designation | Location | | | | |
| FCPE | Schenectady, NY | 2 | 1 | KAPL RFP-NSF | 70 00 65 00 |
| Horizontal/ Split Table Solution Base | Golden, CO | 1 | 1 | RFP-NSF | 65 00 |

**REACTORS AND FACILITIES
SHUTDOWN OR DISMANTLED**

REACTORS AND FACILITIES SHUTDOWN OR DISMANTLED

1. POWER REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

A. Central-Station Electric Power Plants

| Name (licensee) [docket number] | Location | Principal nuclear contractor | Type | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down permanently (yr mo) | Comment |
|---|-------------------|------------------------------------|---|-----------------------------------|----------------------------|-----------------------------------|-------------------------------------|---|
| Boiling Nuclear Superheater Power Station (AEC and Puerto Rico Water Resources Authority) | Punta Higuera, PR | Comb. | Boiling water, integral nuclear superheat | 16.5 | 50.0 | 64 00 | 68 00 | |
| Carolinas-Virginia Tube Reactor (Carolinas-Virginia Nuclear Power Associates, Inc.) | Parr, SC | West. | Pressure tube, heavy water | 17.0 | 64.0 | 63 00 | 67 01 | The last CVTR shutdown occurred 1/24/67. A license amendment issued 6/14/67 authorizes CVNPA to possess but not operate the CVTR. |
| Dresden Nuclear Power Station, Unit 1 (Commonwealth Edison Co.) [50-010] | Morris, IL | GE | Boiling water | 200.0 | 700.0 | 59 00 | 78 10 | |
| Elk River Reactor (AEC and Rural Cooperative Power Association) | Elk River, MN | AC | Boiling water | 22.0 | 58.2 | 62 00 | 68 02 | The Elk River Reactor was shut down due to technical problems in February 1968; in 1974, dismantling and removal of this facility was completed. |
| Enrico Fermi Atomic Power Plant, Unit 1 (Power Reactor Development Co.) [50-16] | Lagoona Beach, MI | PRDC | Sodium cooled, fast | 60.9 | 200.0 | 63 00 | 72 09 | |
| Fort St. Vrain Nuclear Generating Station (Public Service Company of Colorado) [50-257] | Platteville, CO | GA | High temperature, gas cooled | 330.0 | 842.0 | 74 01 | 89 08 | |
| Hallam Nuclear Power Facility, Sheldon Station (AEC and Consumers Public Power District) | Hallam, NE | AI | Sodium graphite | 75.0 | 240.0 | 62 00 | 64 09 | The Hallam Nuclear Power Facility was shut down in September 1964 due to moderator-can failures. Entombment of the reactor was completed in 1968. |
| Humboldt Bay Power Plant, Unit 3 (Pacific Gas & Electric Co.) [50-133] | Eureka, CA | GE | Boiling water | 65.0 | 242.0 | 63 00 | 76 07 | |
| Indian Point Station, Unit 1 (Consolidated Edison Co. of New York, Inc.) [50-3] | Buchanan, NY | B&W | Pressurized water | 265.0 | 615.0 | 62 00 | 74 10 | In the Consolidated Edison Indian Point Station, the 615 MW(t) was increased by an oil-fired superheater to produce 265 MW(e) net. |
| La Crosse (Genoa) Nuclear Generating Station (Dairyland Power Cooperative) [50-409] | La Crosse, WI | AC | Boiling water | 48.0 | 165.0 | 67 07 | 87 04 | |
| Pathfinder Atomic Plant (Northern States Power Co.) | Sioux Falls, SD | AC | Boiling water | 58.5 | 190.0 | 64 00 | 67 09 | The Pathfinder Plant has been shut down since November 1967. On Sept. 9, 1968, Northern States Power Company announced plans to install gas-fired boilers for operation the summer of 1969. |
| Peach Bottom Atomic Power Station, Unit 1 (Philadelphia Electric Co.) [50-171] | Peach Bottom, PA | GA | High temperature, gas cooled | 40.0 | 115.0 | 66 00 | 74 10 | |

1. POWER REACTORS

A. Central Station Electric Power Plants (Continued)

| Name (licensee) [docket number] | Location | Principal nuclear contractor | Type | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down permanently (yr mo) | Comment |
|---|------------------|------------------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------------------|---|
| Piqua Nuclear Power Facility (AEC and City of Piqua) | Piqua, OH | AI | Organic cooled and moderated | 11.4 | 45.5 | 63 00 | 66 00 | The dismantlement program for the Piqua Nuclear Power Facility was completed in February 1969. |
| Rancho Seco Nuclear Generating Station, Unit 1 (Sacramento Municipal Utility District) [50-312] | Clay Station, CA | B&W | Pressurized water | 873.0 | 2,772.0 | 74 09 | 89 06 | Possession only license, 3/92. |
| San Onofre Nuclear Generating Station, Unit 1 (Southern California Edison) [50-206] | San Clemente, CA | West. | Pressurized water | 436.0 | 1,347.0 | 67 06 | 92 11 | Possession only license is contingent as of 10/92 on the fuel being removed. |
| Shippingport Atomic Power Station (DOE and Duquesne Light Co.) | Shippingport, PA | West. | Pressurized water | 60.0 | 236.0 | 57 00 | 82 10 | The first core for the Shippingport station began power operation in 1957 with a capacity rating of 60 MW(e). The second core began power operation in 1965 with a capacity rating of 90 MW(e). The third core, a light water breeder reactor (LWBR), began power operation in 1977, with a capacity rating of 60 MW(e). Owned by the Department of Energy, the reactor plant was shut down on Oct. 1, 1982. Defueling was completed in September 1984. Decommissioning was completed in December 1989, and the site was released for use without any restrictions. |
| Shoreham Nuclear Power Station (Long Island Lighting Co.) [50-322] | Brookhaven, NY | GE | Boiling water | 820.0 | 2,436.0 | 85 02 | 91 07 | Possession only license, 7/20/91. |
| Three Mile Island Nuclear Station, Unit 2 (GPU Nuclear Corp.) [50-320] | Middletown, PA | B&W | Pressurized water | 906.0 | 2,772.0 | 78 00 | 79 00 | Three Mile Island Nuclear Station, Unit 2, has been shut down since the 3/28/79 accident. Core removal is finished. |
| Trojan Nuclear Plant, Unit 1 (Portland General Electric Co.) [50-344] | Prescott, OR | West. | Pressurized water | 1075.0 | 3411.0 | 75 12 | 93 00 | Possession only license, 5/5/93. |
| Yankee Nuclear Power Station (Yankee Atomic Electric Co.) [50-029] | Rowe, MA | West. | Pressurized water | 167.0 | 600.0 | 60 08 | 92 02 | Licensee announced permanent shutdown, 2/92. Possession only license, 8/92. |

B. Dual-Purpose Plants

| Name (Owner) | Location | Principal nuclear contractor | Type | Power capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Comment |
|-----------------|------------------|------------------------------------|----------|--------------------------------|----------------------------|-----------------------------------|----------------------|---|
| N Reactor (DOE) | Hanford Site, WA | WHC | Graphite | 860.0 | 4000.0 | 63 12 | 91 00 | N Reactor, a DOE-owned reactor for production of special nuclear materials, also produced steam that was supplied to an adjacent electric generating plant, owned and operated by Washington Public Power Supply System. The reactor has been directed to transition from standby to the termination mode in preparation for decommissioning. |

C. Propulsion (Maritime)

| Name and/or owner | Nuclear designer | Shipbuilder | Type | Maximum shaft horsepower | Licensed power MW(e) | Start-up (yr mo) | Shut down (yr mo) |
|---|------------------|-------------|-------------------|--------------------------|----------------------|------------------|-------------------|
| Nuclear Ship SAVANNAH (Maritime Administration) | B&W | NYSC | Pressurized water | 22,000 | 30.0 | 61 00 | 71 00 |

2. EXPERIMENTAL POWER-REACTOR SYSTEMS

A. Electric-Power Systems

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Desig. Type. Principal nucl. contr. | Comment |
|---|--------------------------|----------------------|------------------------|-----------------------------|----------------------|-----------------------------|-------------------|---|--|
| Boiling Reactor Experiment No. 1 (DOE). INEL Site, ID | | 1,400.0 | | | | 53 00 | 54 00 | BORAX-1 Boiling water. ANL | |
| Boiling Reactor Experiment No. 5 (DOE). INEL Site, ID | 2,600.0 | 20,000.0 | | | | 62 00 | 64 00 | BORAX-5 Boiling water, integral nuclear superheat. ANL | |
| Boiling Reactor Experiments (DOE). INEL Site, ID | 2,400.0 | 15,500.0 | | | | 54 00 | 58 06 | BORAX-2, 3, 4. Boiling water. ANL | This facility was originally built and operated in 1954 as the Boiling Reactor Experiment No. 2 (BORAX-2). With the addition of a turbogenerator, it operated during 1955 as BORAX-3 and on 7/17/55 produced sufficient electricity to light and power Archo, ID—a U.S. first. BORAX-4, a further modification, operated from 12/56 to 6/58, when the experiment was shut down. |
| ESADA Vallecitos Experimental Superheat Reactor (NRC). Pleasanton, CA | | 17,000.0 | | | | 63 00 | 67 02 | EVESR. Light-water moderated, superheater. GE | Owner: Empire States Atomic Development Associates and General Electric Company. |
| Experimental Beryllium Oxide Reactor (DOE). INEL Site, ID | | 10,000.0 | | | | | | EBOR. Gas cooled, BeO moderated. GA | The EBOR reactor experiment was terminated in December 1966 prior to completion of construction. |
| Experimental Boiling Water Reactor (DOE). Argonne, IL | 4,000.0 | 100,000.0 | | | | 56 00 | 67 06 | EBWR. Boiling water. ANL | The EBWR achieved 100,000 kW(t) 11/11/62. Operation of EBWR in the Boiling Water Program was closed out 12/62. The reactor was used in support of the Plutonium Recycle Program and attained criticality using plutonium as its principal fuel 9/22/65. In support of that program, it operated at power levels as high as 70,000 kW(t). Operation in that program was completed 6/67. |

2. EXPERIMENTAL POWER-REACTOR SYSTEMS

PART I CIVILIAN REACTORS (DOMESTIC)

A. Electric-Power Systems (Continued)

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Desig. Type. Principal nucl. contr. | Comment |
|--|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|--|--|
| Experimental Breeder Reactor No. 1 (DOE). INEL Site, ID | 150.0 | 1,400.0 | | | | 51 00 | 64 00 | EBR-1. NaK-cooled, fast. ANL | In a trial run 12/21/51 and 12/22/51, EBR-1 generated the world's first electric power from nuclear energy and was first to demonstrate, in 7/53, the feasibility of breeding and the compatibility with breeding economy of sodium-potassium alloy as a liquid-metal coolant. It operated with a plutonium-bearing core (Mark IV) from 11/62 to 12/63. The reactor was decommissioned and dismantled early in 1964. The facility was dedicated as a historic landmark 8/26/66. It is open to the public from Memorial Day weekend to Labor Day weekend, annually. |
| Experimental Gas Cooled Reactor (DOE). Oak Ridge, TN | 21,900.0 | 84,300.0 | | | | | | EGCR. Gas cooled, graphite moderated. KE-AC | The EGCR project was terminated 1/66 prior to the completion of construction. |
| 82 Experimental Organic Cooled Reactor (DOE). INEL Site, ID | | 40,000.0 | | | | | | EOCR. Organic cooled and moderated. Fluor-Al | EOCR construction was terminated 12/62. The facility was mothballed prior to operation. |
| Heavy Water Components Test Reactor (DOE). SRL, Aiken, SC | | 61,100.0 | | | | 62 00 | 64 00 | HWCTR. Pressurized heavy water. Du Pont | |
| Homogeneous Reactor Experiment No. 1 (DOE). Oak Ridge, TN | 140.0 | 1,000.0 | | | | 52 00 | 54 00 | HRE-1. Aqueous homogeneous solution (UO_2SO_4). ORNL | |
| Homogeneous Reactor Experiment No. 2 (DOE). Oak Ridge, TN | 300.0 | 5,200.0 | | | | 57 00 | 61 00 | HRE-2. Aqueous homogeneous solution (UO_2SO_4). ORNL | |
| Los Alamos Molten Plutonium Reactor Experiment (DOE). Los Alamos, NM | | 1,000.0 | | | | 61 00 | 63 00 | LAMPRE-1. Fast molten plutonium fueled, sodium cooled. LANL | |
| Los Alamos Power Reactor Experiment No. 1 (DOE). Los Alamos, NM | | 2,000.0 | | | | 56 00 | 57 00 | LAPRE-1. Aqueous homogeneous (phosphoric acid). LANL | |
| Los Alamos Power Reactor Experiment No. 2 (DOE). Los Alamos, NM | | 1,000.0 | | | | 59 00 | 59 00 | LAPRE-2. Aqueous homogeneous (phosphoric acid). LANL | |
| Molten Salt Reactor Experiment (DOE). Oak Ridge, TN | | 8,000.0 | | | | 65 00 | 69 00 | MSRE. Single region, graphite moderated. ORNL | |

| | | | | | | | |
|---|----------|----------|--|-------|-------|--|--|
| Organic Moderated Reactor Experiment (DOE). INEL Site, ID | 12,000.0 | | | 57 00 | 63 00 | OMRE. Organic cooled and moderated. AI | OMRE demonstrated the technical and economic feasibility of using liquid hydrocarbon terphenyls as coolant and/or moderator. |
| Plutonium Recycle Test Reactor (DOE). Richland, WA | 70,000.0 | | | 60 00 | 69 00 | PRTR. Pressure tube, heavy water moderated and cooled. WHC | |
| Saxton Nuclear Experimental Reactor Project (DOE). Saxton, PA | 3,000.0 | 23,500.0 | | 62 00 | 72 00 | No Desg. Pressurized water. West. | Owner: Saxton Nuclear Experimental Corp. |
| Sodium Reactor Experiment (DOE). Santa Susana, CA | 5,700.0 | 20,000.0 | | 57 00 | 64 02 | SRE. Sodium graphite. AI | |
| Southwest Experimental Fast Oxide Reactor (NRC). Strickler, AR | 20,000.0 | | | 69 00 | 72 00 | SEFOR. Sodium cooled, fast. GE | |
| Ultra High Temperature Reactor Experiment (DOE). Los Alamos, NM | 3,000.0 | | | 68 00 | 70 00 | UHTREX. Helium cooled. LANL | |
| Vallecitos Boiling Water Reactor (NRC). Pleasanton, CA | 5,000.0 | 33,000.0 | | 57 00 | 63 12 | VBWR. Boiling water. GE | Owner: General Electric Company and Pacific Gas & Electric Co. |

B. Space Nuclear Auxiliary Power (SNAP)

| 2 | Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Designation. Type. Principal nuclear contractor | Comment |
|--|------------------------------------|--------------------------|----------------------|------------------------|--------------------------|----------------------|-----------------------------|-------------------|---|--|
| | | | | | | | | | | |
| SNAP-02 Developmental System (DOE). Santa Susana, CA | | | | | 50.0 | 61 00 | 63 00 | | S2DS. NaK-cooled. AI | |
| SNAP-02 Experimental Reactor (DOE). Santa Susana, CA | | | | | 50.0 | 59 00 | 60 00 | | SER. NaK-cooled. AI | |
| SNAP-02/10A TSF Shielding Experiment (DOE). Oak Ridge, TN | | | | | 10.0 | 67 00 | 73 00 | | SNAP-TSF. NaK-cooled. AI-ORNL | |
| SNAP-06 Developmental Reactor (DOE). Santa Susana, CA | | | | | 600.0 | 68 00 | 69 00 | | S8DR. NaK-cooled. AI | |
| SNAP-08 Experimental Reactor (DOE). Santa Susana, CA | | | | | 600.0 | 62 00 | 65 00 | | S8ER. NaK-cooled. AI | |
| SNAP-10A Flight System (DOE). In orbit, US | | 0.5 | | 39.0 | 65 00 | 65 00 | | | S10FS-4. NaK-cooled. AI | S10FS-4 operated in orbit April-May 1965. Operation terminated unexpectedly after 43 days at power, probably owing to a sequence of failures of electrical components of the spacecraft with resulting spurious commands shutting down the reactor. An identical ground test unit, S10FS-3, operated successfully for more than a year before being shut down in 1966. |
| SNAP-10A Flight System (DOE). Oak Ridge, TN | | 0.5 | | 39.0 | (Spare) | | | | S10FS-5. NaK-cooled. AI | |
| SNAP-10A Flight System Ground Test No. 1 (DOE). | | 0.5 | | 39.0 | 64 00 | 64 00 | | | S10FS-1. NaK-cooled. AI | |
| SNAP-10A Flight System Ground Test No. 3 (DOE). Santa Susana, CA | | 0.5 | | 39.0 | 64 00 | 66 00 | | | S10FS-3. NaK-cooled. AI | See comment for SNAP-10 Flight System, S10FS-4. |

2. EXPERIMENTAL POWER-REACTOR SYSTEMS

PART I CIVILIAN REACTORS (DOMESTIC)

C. Space Propulsion

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr sec) | Shot down (yr sec) | Designation. Type. Principal nuclear contractor | Comment |
|---|--------------------------------|----------------------------|------------------------------|--------------------------------|----------------------------|------------------------------------|--------------------------|---|---------|
| | | | | | | | | | |
| Fuel Element Test Bed (DOE). NRDS, NV | | | 44,000.0 | | | 72 00 | 72 00 | NE-1. Open cycle, gaseous hydrogen. LANL | |
| Fuel Element Test Reactor (DOE). NRDS, NV | | | 514,000.0 | | | Indef. | 68 00 | Pewee-1. Open cycle, liquid hydrogen. LANL | |
| Fuel Element Test Reactor (DOE). NRDS, NV | | | 514,000.0 | | | Indef. | 73 00 | Pewee-2. Open cycle, liquid hydrogen. LANL | |
| Ground Experimental Engine Experiment (DOE). NRDS, NV | | | 1,100,000.0 | | | Indef. | 73 00 | XE-Backup. Open cycle, liquid hydrogen. AG-West. | |
| Ground Experimental Engine Experiment (DOE). NRDS, NV | | | 1,100,000.0 | | | 68 00 | 69 00 | XE-Prime. Open cycle, liquid hydrogen. AG-West. | |
| 5 Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV | | | 109,600.0 | | | 64 00 | 64 00 | NRX-A2. Open cycle, liquid hydrogen. AG-West. | |
| Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV | | | 1,100,000.0 | | | 65 00 | 65 00 | NRX-A3. Open cycle, liquid hydrogen. AG-West. | |
| Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV | | | 1,120,000.0 | | | 66 00 | 66 00 | NRX-A5. Open cycle, liquid hydrogen. AG-West. | |
| Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV | | | 1,199,000.0 | | | 67 00 | 67 00 | NRX-A6. Open cycle, liquid hydrogen. AG-West. | |
| Nuclear Rocket Reactor Engine System Test (NERVA) (DOE). NRDS, NV | | | 1,155,000.0 | | | 66 00 | 66 00 | NRX-A4/EST. Open cycle, liquid hydrogen AG-West. | |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | | | 70,000.0 | | | 59 00 | 59 00 | Kiwi-A. Open cycle, gaseous hydrogen. LANL | |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | | | 85,000.0 | | | 60 00 | 60 00 | Kiwi-A Prime. Open cycle, gaseous hydrogen. LANL | |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | | | 100,000.0 | | | 60 00 | 60 00 | Kiwi-A3. Open cycle, gaseous hydrogen. LANL | |

| | | | | | |
|---|-------------|--|-------|-------|---|
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | 300,000.0 | | 61 00 | 61 00 | Kiwi-B1A. Open cycle, gaseous hydrogen. LANL |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | 900,000.0 | | 62 00 | 62 00 | Kiwi-B1B. Open cycle, liquid hydrogen. LANL |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | 500,000.0 | | 62 00 | 62 00 | Kiwi-B4A. Open cycle, liquid hydrogen. LANL |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | 1,000,000.0 | | 64 00 | 64 00 | Kiwi-B4D. Open cycle, liquid hydrogen. LANL |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | 950,000.0 | | 64 00 | 64 00 | Kiwi-B4E. Open cycle, liquid hydrogen. LANL |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | 1,070,000.0 | | 65 00 | 65 00 | Phoebus 1A. Open cycle, liquid hydrogen. LANL |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | 1,400,000.0 | | 67 00 | 67 00 | Phoebus 1B. Open cycle, liquid hydrogen. LANL |
| Nuclear Rocket Reactor Experiment (DOE). NRDS, NV | 4,200,000.0 | | 68 00 | 68 00 | Phoebus 2A. Open cycle, liquid hydrogen. LANL |

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

A. General Irradiation Test

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Designation. Type. Principal nuclear contractor | Comment |
|--|--------------------------|----------------------|------------------------|-----------------------------|----------------------|-----------------------------|-------------------|---|--|
| Engineering Test Reactor (DOE). INEL, ID | | | 175,000.0 | | | 57 00 | 81 00 | ETR. Tank KE-GE. | Reactor was shut down in 1973 for modifications and insertion of Sodium Loop Safety Facility (SLSF) loop. Operation resumed in 1975. Deactivated in 1981 and no longer operable. |
| Fast Flux Test Facility (DOE). Hanford Site, WA | | 291,000.0 | | | | 80 02 | 93 12 | FFTF. Sodium cooled, loop. WHC | The Fast Flux Test Facility initiated shutdown activities 12/93. |
| General Electric Testing Reactor (NRC). Pleasanton, CA | | 50,000.0 | | | | 58 00 | 77 00 | GETR. Tank. Owner. | |
| Materials Testing Reactor (DOE). INEL, ID | | 40,000.0 | | | | 52 00 | 70 00 | MTR. Tank. ORNL-ANL-Blaw-Knox | In August 1958 the MTR was operated with an experimental plutonium core at power levels up to 30,000 kW(t). It demonstrated the ability of plutonium fuel elements to perform satisfactorily in a high-flux research or test reactor. Operation as a test reactor was terminated 6/30/69, and a Plutonium-240 (Phoenix) core was run in FY 1970. Reactor was decommissioned in 1974. |
| Plum Brook Reactor Facility (NRC). Sandusky, OH | 60,000.0 | | | | | 61 00 | 74 00 | NASA-TR. Tank. NASA | |
| Westinghouse Testing Reactor (NRC). Waltz Mill, PA | 60,000.0 | | | | | 59 00 | 62 00 | WTR. Tank. Owner | |

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

B. High-Power Research and Test

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Designation. Type. Principal nuclear contractor | Comment |
|---|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|--|-----------------------|
| Ames Laboratory Research Reactor (DOE). Ames, IA | | | 5,000.0 | | | 65 00 | 77 00 | ALRR. Heavy water. AMF | |
| Argonne Research Reactor (DOE). Argonne, IL | | | 5,000.0 | | | 54 00 | 79 00 | CP-5. Heavy. water ANL | |
| Babcock & Wilcox Nuclear Development Center Test Reactor (NRC). Lynchburg, VA | | | 6,000.0 | | | 64 00 | 71 00 | BAWTR. Pool. Owner | |
| Cintichem, Inc. Reactor (NRC). Sterling Forest, NY | | | 5,000.0 | | | 61 00 | 90 00 | CINR. Pool. AMF | Being decommissioned. |
| Industrial Reactor Laboratories, Inc. (NRC). Plainsboro, NJ | | | 5,000.0 | | | 58 00 | 75 00 | IRL. Pool. AMF | |
| Oak Ridge Research Reactor (DOE). Oak Ridge, TN | | | 30,000.0 | | | 58 00 | 87 00 | ORR. Tank. ORNL | Shut down—Defueled. |
| Sandia Engineering Reactor (DOE). Kirtland AFB, NM | | | 5,000.0 | | | 61 00 | 70 00 | SER. Tank. Sandia | |

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C. Safety Research and Test

| | | | | | | | | | |
|---|--|--|----------|--|-------|-------|--|--|--|
| King Intense Neutron Generator (DOE). Los Alamos, NM | | | | | 72 00 | 77 00 | Kinglet. Homogeneous. LANL | | Transient. |
| Kiwi-Transient Test Reactor (DOE). NRDS, NV | | | | | 65 00 | 65 00 | Kiwi-TTR. Kiwi/NERVA. LANL | | |
| Loss of Fluid Test (DOE). INEL, ID | | | 55,000.0 | | | 78 00 | 85 07 | LOFT. Pressurized water. EG&G-ID | LOFT covered most of the concerns related to light-water safety. The first tests were done for NRC, and the last eight were done for a consortium of OECD countries and the U.S. The last two fission-product-release tests measured release and transport of fission products. There was an intentional core damage causing a partial meltdown. Facility has been inactivated and placed in cold standby. |
| Power-Burst Facility (DOE). INEL, ID | | | 28,000.0 | | | 73 00 | 92 00 | PBF. Open tank. EG&G-ID | |
| SNAP-10A Transient Test No. 2 (DOE). INEL, ID | | | | | 65 00 | 66 01 | SNAPTRAN-2. Be-reflected SNAP-10A. AI-PPC | The SNAPTRAN series of experiments was designed to develop, in a land-based environment, safety information on space auxiliary power reactors through excursion testing at various temperatures and rates of reactivity insertion. The destructive experiments approach the maximum credible accidents postulated for SNAP reactor systems. SNAPTRAN-1 was converted to SNAPTRAN-2 for destructive testing 1/66. | |

**SNAP-10A Transient Test No. 3
(DOE). INEL, ID**

Special Power Excursion Reactor
Test No. 1 (DOE). INEL, ID
Special Power Excursion Reactor
Test No. 2 (DOE). INEL, ID

Special Power Excursion Reactor
Test No. 3 (DOE). INEL, ID

Special Power Excursion Reactor
Test No. 4 (DOE). INEL, ID

64 00 **64 00** **SNAPTRAN-3.**
H₂O-reflected
SNAP-10A.
PPC-AI

55 00 **64 00** SPEKT-1. Open
tank. PPC

60 00 **65 00** SPEKT-2.
Pressurized
water. PPC

58 00 **68 00** SPEKT-3.
Pressurized
water. PPC

62 00 **70 00** SPEKT-4.
Pool. INC

D. General Research

Accelerator Pulsed Fast Critical
Assembly (DOE). La Jolla, CA

1.0

67 00 **73 00** APFA-III. Fast.
GA

The APFA-III was previously operated as the
KUKLA Prompt Critical Assembly at
Lawrence Livermore National Laboratory
at Livermore, CA.

American Standard Inc. (NRC).
Mountain View, CA

58 00 **60 00** UTR-1.
Graphite/water.
AS, Inc.

This reactor was shipped abroad for exhibition
purposes in the USAEC Atoms for Peace
Exhibit in the Tokyo International Trade Fair
in 1959, and in Cairo, Egypt, and Lahore,
Pakistan, in 1960.

53 Annular Core Pulsed Reactor
(DOE). Kirtland AFB, East, NM

67 00 **77 00** ACPR. U-Zr
hydride. GA

In 1977 the Annular Core Pulsed Reactor
(ACPR) was shut down. After replacement of
fuel and other modifications, the unit was
renamed the Annular Core Research Reactor.

Argonne CP-3, rebuilt as
CP-3' (DOE). Palos Park, IL

300.0

44 00 **63 00** CP-3'. Heavy
water. Met. Lab.

Argonne Low Power Research
Reactor (DOE). Argonne, IL

250.0

62 00 **70 00** Juggernaut.
Graphite/water.
ANL

After the assembly and operation of this reactor
in the government exhibit at Geneva in 9/58, it
was dismantled and returned to ANL, where it
was rebuilt as a 250-kW(t) Juggernaut.

Argonne National Laboratory
(DOE). Argonne, IL

10.0

57 00 **72 00** AGN-201-108.
Homog. solid. AGN

Argonne Nuclear Assembly
for University Training
(DOE). Argonne, IL

10.0

57 00 **72 00** Argonaut (CP-11).
Graphite/water.
ANL

Argonne Thermal Source
Reactor (DOE). Argonne, IL

57 00

57 00 **88 00** ATSR. Thermal. ANL

Atomics International
(NRC). Canoga Park, CA

1,000.0

57 00 **58 00** L-47. Homogeneous.
AI

Babcock & Wilcox Lynchburg
Pool Reactor (NRC).
Lynchburg, VA

2,000.0

58 00 **81 00** LRP. Pool. Owner

Battelle Memorial Institute
(NRC). West Jefferson, OH

200.0

56 00 **74 00** BRR. Pool. AMF

Biological Research
Reactor (DOE). Argonne, IL

20,000.0

64 00 **92 00** JANUS. Tank. ANL

Brookhaven Graphite Research
Reactor (DOE). Upton, NY

50 00 **69 00** BGRR. Air cooled,
graphite mod-
erated. AU, Inc.

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

D. General Research (Continued)

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Designation. Type. Principal nuclear contractor | Comment |
|--|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|--|--|
| Brookhaven Neutron Source Reactor No. 1 (DOE). Upton, NY | | | 100.0 | | | 58 00 | 70 00 | SCHIZO. Tank. AU. Inc. | |
| Brookhaven Neutron Source Reactor No. 2 (DOE). Upton, NY | | | 100.0 | | | 65 00 | 70 00 | PHRENIC. Tank. AU. Inc. | |
| Bulk Shielding Reactor (DOE). Oak Ridge, TN | | | 2,000.0 | | | 50 00 | 91 00 | BSR. Pool. ORNL | Shut down—to be defueled. |
| Chicago Pile 1, rebuilt as CP-2 (DOE). Chicago, IL | | | 0.2 | | | 42 00 | 54 00 | CP-2. Graphite. Met. Lab. | In 1943 Manhattan Engineer District disassembled Chicago Pile 1 and rebuilt at Palos Park, IL, as Chicago Pile 2. CP-2 had a thermal-power level of 10 kW. |
| Curtiss-Wright Nuclear Research Laboratory of the Commonwealth of Pennsylvania (NRC). Quakertown, PA | | | 1,000.0 | | | 58 00 | 66 00 | CWRR. Pool. Owner | |
| DOE Demonstration Reactor (DOE). Oak Ridge, TN | | | 10.0 | | | 69 00 | 69 00 | Demo Reac. Pool. Lockheed | This reactor was formerly called the Latin American Demonstration Reactor and was operated initially in São Paulo, Brazil, 10/69. It is currently in storage at Oak Ridge. |
| European-Asian Exhibit Program (DOE). Oak Ridge, TN | | | 10.0 | | | 63 00 | 69 00 | EAEP. Pool. Lockheed | This reactor was operated in the USAEC Atoms for Peace Exhibit in Vienna, Austria, 6/63; Belgrade, Yugoslavia, 9/63; Madrid, Spain, 4/64; Lisbon, Portugal, 4/65; Utrecht, Netherlands, 3/66; Dublin, Ireland, 9/66 to 10/66; Ankara, Turkey, 4/67 to 5/67; Tehran, Iran, 11/67 to 12/67; Taipei, Taiwan, 4/68 to 5/68; Seoul, Korea, 9/68 to 10/68; Manila, Philippines, 2/69 to 3/69; and Bucharest, Romania, 10/69. |
| Fast Neutron Source Reactor (DOE). Upton, NY | | | | | | 67 00 | 70 00 | BNL/FS-1. Fast. BNL | |
| Fast Source Reactor (DOE). INEL Site, ID | | | 1.0 | | | 59 00 | 93 00 | | |
| General Atomics Technologies (DOE). San Diego, CA | | | 50.0 | | | 60 00 | 60 00 | TRIGA-Mk II. U-Zr hydride. Owner | This TRIGA-Mk II was operated at the New Delhi World Agricultural Fair in 1960. It was dismantled for storage in California by Chevron USA Corporation. Owner: World Agricultural Fair-U.S. Exhibit Reactor. |
| Health Physics Research Reactor (DOE). Oak Ridge, TN | | | 10.0 | | | 62 00 | 91 00 | HPRR. Fast burst. ORNL | Shut down—Defueled. |
| High Temperature Lattice Test Reactor (DOE). Richland, WA | | | 2.0 | | | 67 00 | 71 00 | HTLTR. Graphite moderated. PNL | |

| | | | | | |
|--|---------|-------|-------|---|---|
| Illinois Institute of Technology Research Institute (DOE). Chicago, IL | 75.0 | 56.00 | 67.00 | ARR (L-54). Homogeneous. AI | Owner: Armour Research Foundation. |
| Kinetic Experiment on Water Boilers (NRC). Santa Susana, CA | | 56.00 | 67.00 | KEWB. Homogeneous. AI | The KEWB reactor was operated by AI from 1956 to 1967 as the Kinetic Experiment on Water Boilers. Owner: Rockwell International. No power listed: transient. |
| Livermore Pool Type Reactor (DOE). Livermore, CA | 3,000.0 | 57.00 | 80.00 | LPTR. Tank. FW | |
| Livermore Water Boiler (DOE). Livermore, CA | 0.5 | 53.00 | 61.00 | LIWB. Homogeneous. AI | |
| Lockheed Aircraft Corp. (NRC). Dawsonville, GA | | 60.00 | 60.00 | No Desg. Pool. Lockheed | |
| Los Alamos Fast Reactor (DOE). Los Alamos, NM | 25.0 | 46.00 | 53.00 | Clementine. Fast, plutonium fuel, mercury cooled. LANL | |
| Los Alamos LOPO Reactor (DOE). Los Alamos, NM | | 44.00 | 44.00 | LOPO. Homogeneous. LANL | |
| Los Alamos Water Boiler (DOE). Los Alamos, NM | 5.5 | 44.00 | 50.00 | HYPO. Homogeneous. LANL | |
| Los Alamos Water Boiler (DOE). Los Alamos, NM | 25.0 | 50.00 | 74.00 | SUPO. Homogeneous. LANL | |
| Louisiana State University Nuclear Science Center (DOE). Baton Rouge, LA | 2.0 | 65.00 | 66.00 | SNARE. Pool. Sandia | In 1965 and 1966 this reactor operated at Sandia, NM, as SNARE. Prior to that time it was operated at INEL as the Shield Test Pool Reactor (SUSIE) in the Aircraft Nuclear Propulsion Program from 1959 to 1962. It was shut down in 1966 and transferred to Louisiana State University 6/66, where it was never assembled. Owner: Phillips Petroleum Co. |
| Low Intensity Test Reactor (DOE). Oak Ridge, TN | 3,000.0 | 50.00 | 68.00 | LITR. Tank. ORNL | |
| Low Temperature Neutron Irradiation Facility (DOE). Oak Ridge, TN | | 86.00 | 91.00 | LTNIF. Pool. ORNL | |
| NASA Mock-Up Reactor (NRC). Sandusky, OH | 100.0 | 63.00 | 73.00 | MUR. LWR. Lockheed | |
| Neutron Radiography Facility (DOE). Hanford Site, WA | 250.0 | 77.00 | 90.00 | NRF. U-Zr hydride. WHC | The Neutron Radiography Facility was used to perform neutron radiography of reactor fuel pins. The reactor was shut down in 1989 and has been converted to a fuel storage basin. |
| Northrop Corporate Laboratories (NRC). Hawthorne, CA | 100.0 | 63.00 | 86.00 | TRIGA-Mk F. U-Zr hydride. GA | Owner: Space Radiation Laboratory. This TRIGA reactor was capable of being pulsed and of steady-state operation. |
| Nuclear Effects Reactor (DOE). NTS, NV | | 62.00 | 70.00 | FRAN. Prompt burst. LLNL/PPC | Until mid-1967 FRAN was operated by LLNL at the Nevada Test Site, and until 1970 it was operated in the former ML-1 reactor area at INEL. In mid-1970 it was transferred back to LLNL. Fuel was removed for processing. |
| Nuclear Effects Reactor (DOE). San Diego, CA | | 59.00 | 64.00 | KUKLA. Prompt burst. LLNL | |

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

PART I CIVILIAN REACTORS (DOMESTIC)

D. General Research (Continued)

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Designation. Type. Principal nuclear contractor | Comment |
|---|-----------------------------|----------------------------|------------------------------|--------------------|----------------------------|-----------------------------------|-------------------------|--|---|
| Nuclear Examination Reactor (NRC). Santa Susana, CA | | | 3.0 | | | 52 00 | 80 00 | L-85 (AE-6). Homogeneous. AI | Ownership of this reactor was transferred to North American Rockwell 12/71 and was redesignated the Nuclear Examination Reactor or L-85 rather than AE-6. The AE-6, also designated WBNS, was built and first operated at Downey, CA. It was moved to Santa Susana in 1956. |
| Oak Ridge Graphite Reactor (DOE). Oak Ridge, TN | | | | 3,500.0 | | 43 00 | 69 00 | ORG. Graphite. CL | |
| Pawling Research Reactor (NRC). Pawling, NY | | | | | | 58 00 | 71 00 | PRR. LWR. UNC | Owner: United Nuclear Corp. |
| Physical Constants Test Reactor (DOE). Richland, VA | | | 0.1 | | | 55 00 | 72 00 | PCTR. Graphite. PNL | |
| Radiation Effects Reactor (NRC). Dawsonville, GA | | | | 3,000.0 | | 58 00 | 70 00 | RER. Pool. Lockheed | The RER was previously used in the terminated Aircraft Nuclear Propulsion Program. A license authorizing Lockheed to operate the reactor as a commercial facility was issued 7/62, and 8/62 the USAF transferred the facility to the General Services Administration. Lockheed acquired the title to the facility 3/65. |
| Rockwell International (NRC). Canoga Park, CA | | | | | | 58 00 | 74 00 | L-77. Homogeneous. AI | |
| Sandia Pulsed Reactor (DOE). Kirtland AFB, East, NM | | | | | | 61 00 | 67 00 | SPR. Prompt burst. Sandia | |
| Shield Test and Irradiation Reactor (DOE). Santa Susana, CA | | | 1,000.0 | | | 61 00 | 72 00 | STIR. Pool. AI | This reactor was previously designated STF for SNAP Shield Test Facility. |
| Thermal Test Reactor No. 2 (DOE). Richland, WA | | | 0.1 | | | 55 00 | 72 00 | TTR-2. Graphite. PNL | |
| Torrey Pines, TRIGA-Mk III Reactor (NRC). La Jolla, CA | | | | 1,500.0 | | 66 00 | 73 00 | TRIGA-Mk III. U-Zr hydride. Owner | Owner: General Atomic. |
| Tower Shielding Reactor (DOE). Oak Ridge, TN | | | 500.0 | | | 54 00 | 58 00 | TSR. BSR-type in tank. ORNL | |
| Tower Shielding Reactor No. II (DOE). Oak Ridge, TN | | | | 1,000.0 | | 60 00 | 92 00 | TSR-2. Light water. ORNL | Shut down—To be defueled. |
| UTR Test Reactor (NRC). Mountain View, CA | | | | | | 61 00 | 63 00 | No Desg. Graphite/water. Owner | Owner: American Radiator & Standard Sanitary Corp. |
| Westinghouse Nuclear Training Center (NRC). Zion, IL | | | 10.0 | | | 72 00 | 87 00 | WNTR. Tank. West. | |

E. University Research and Teaching

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Designation. Type. Principal nuclear contractor | Comment |
|--|-----------------------------|-------------------------|---------------------------|--------------------------------|-------------------------|--------------------------------|----------------------|--|---|
| Brigham Young University (NRC). Provo, UT | | | | | | 67 00 | 87 00 | L-77. Homogeneous. AI | |
| California Polytechnic State University (NRC). San Luis Obispo, CA | | | | | | 73 00 | 80 00 | AGN-201-100. Homog. solid. AGN | California Polytechnic State University received a permit in 12/71 to relocate AGN-201-100 and operate it on the uni- versity's campus. The unit was previously operated starting in 1956 at the Naval Postgraduate School, Monterey, CA. In 1980, AGN-201-100 was shut down and decommissioned. |
| California, Berkeley, University of (NRC). Berkeley, CA | 1,000.0 | | | | | 66 00 | 87 12 | TRIGA-Mk III. U-Zr hydride. GA | |
| California, Los Angeles, University of, School of Engineering and Applied Science (NRC). Los Angeles, CA | 100.0 | | | | | 60 00 | 84 00 | Educator. Graphite/water. AMF | |
| California, Santa Barbara, University of (NRC). Santa Barbara, CA | | | | | | 74 00 | 86 00 | L-77. Homogeneous. AI | |
| Catholic University of America (NRC). Washington, DC | | | | | | 57 00 | 86 00 | AGN-201-101. Homog. solid. AGN | |
| Colorado State University (NRC). Fort Collins, CO | | | | | | 57 00 | 74 00 | AGN-201-109. Homog. solid. AGN | |
| Columbia University (NRC). New York, NY | 250.0 | | | | Licensed | 85 00 | | TRIGA-Mk II. U-Zr hydride. GA | The Columbia University TRIGA-Mk II was licensed to operate by NRC. However, the City of New York has not authorized operation. Therefore Columbia University has not procured fuel. The license was terminated in 1985. |
| Delaware, University of (NRC). Newark, DE | | | | | | 58 00 | 78 00 | AGN-201-113. Homog. solid. AGN | |
| Georgia Institute of Technology (NRC). Atlanta, GA | | | | | | 68 00 | 85 00 | AGN-201-104. Homog. solid. AGN | AGN-201-104 operated at the University of Akron (Ohio) from 1957 until transferred to the Georgia Institute of Technology in 1967. Operations at that facility began in 1968. Decommissioning of AGN-201-104 was achieved in 1986. |

3. TEST, RESEARCH, AND UNIVERSITY REACTORS

E. University Research and Teaching (Continued)

| Name (Regulatory agency). Location | Power capacity net kW(e) | Power licensed kW(t) | Authorized power kW(t) | Power MD capacity net MW(e) | Power licensed MW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Designation. Type. Principal nuclear contractor | Comment |
|--|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|--|---|
| Kansas, University of (NRC). Lawrence, KS | | | 250.0 | | | 61 00 | 87 00 | Model 4180. Pool. BAC | License terminated 10/5/93. |
| Leiand Stanford University (NRC). Palo Alto, CA | | | 10.0 | | | 59 00 | 74 00 | No Desg. Pool. GE | |
| Memphis State University (NRC). Memphis, TN | | | | | | 77 00 | 85 00 | AGN-201-108. Homog. solid. AGN | |
| Michigan State University (NRC). East Lansing, MI | | | 250.0 | | | 69 00 | 89 00 | TRIGA-Mk I. U-Zr hydride. GA | The core of the Michigan State University reactor operated in the University of Illinois TRIGA facility from 1960 until transferred in 1968. The reactor has been decommissioned. The license was terminated 4/5/90. |
| Mississippi State University (NRC). State College, MS | | | | | | | | RRR. Homogeneous. Owner: NSA | This reactor was originally operated by North Carolina State University as the Raleigh Research Reactor (RRR). It was transferred 3/66 to Mississippi State University for reactivation. The RRR was dismantled by NC State in 1963. Owing to funding problems this reactor was never activated. Late in 1981 it was shipped to Bamwell, SC, for disposal. |
| Nevada, University of (NRC). Reno, NV | | | | | | 63 00 | 74 00 | L-77. Homogeneous. AI | |
| North Carolina State University (NRC). Raleigh, NC | | | 10.0 | | | 60 00 | 73 00 | No Desg. Graphite/water. Cook | |
| Oklahoma, University of (NRC). Norman, OK | | | | | | 58 00 | 88 00 | AGN-211-102. Homog. solid, pool. AGN | |
| Oregon State University (NRC). Corvallis, OR | | | | | | 58 00 | 74 00 | AGN-201-114. Homog. solid. AGN | |
| Polytechnic Institute of New York (NRC). New York, NY | | | | | | 67 00 | 74 00 | AGN-201M-105. Homog. solid. AGN | In 1957-1962, AGN-201M-105 was owned and operated by the National Naval Medical Center, Bethesda, MD. Title to the reactor was transferred to New York University early in 1964. A license to operate was issued 4/67. Owner: The Center for Environmental and Energy Research (formerly Puerto Rico Nuclear Center). |
| Puerto Rico Nuclear Center DOE). Mayagüez, PR | | | | | | 59 00 | 79 00 | L-77. Homogeneous. AI | |
| Puerto Rico Nuclear Center (DOE). Mayagüez, PR | | | 2,000.0 | | | 72 00 | 76 00 | TRIGA-FLIP. Pool-TRIGA core. GA | This reactor was operated at the Puerto Rico Nuclear Center from 1960 to 10/76; it was converted to TRIGA-FLIP in 1972. It has been moved to the Neutron Radiography Facility at the National Engineering Laboratory in Idaho. |

| | | | | | |
|--|-------|-------|-------|---|---|
| Texas at Austin, University of (NRC). Austin, TX | 250.0 | 63 00 | 91 00 | TRIGA-Mk I U-Zr hydride. GA | License terminated 10/13/93. |
| Tuskegee Institute (NRC). Tuskegee, AL | | 74 00 | 84 12 | AGN-201-102. Homog. solid. AGN | AGN-201-102 was operated at Oklahoma State University, Stillwater, OK, from 1957 until transferred to Tuskegee Institute in 1972; there it was licensed to operate but was never started up. Tuskegee Institute returned the fuel to the Department of Energy, and the operating license was terminated 10/12/84. Being decommissioned. |
| Utah, University of (NRC). Salt Lake City, UT | | 57 00 | 91 00 | AGN-201-107. Homog. solid. AGN | |
| Virginia, University of (NRC). Charlottesville, VA | | 74 00 | 91 00 | CAVALIER. Reactor type not specified. Owner | Being decommissioned. |
| Virginia Polytechnic Institute (NRC). Blacksburg, VA | 100.0 | 59 00 | 84 00 | UTR-10. Graphite/water. AS Inc. | |
| Washington, University of (NRC). Seattle, WA | 100.0 | 61 00 | 90 00 | Educator. Graphite/water. AMF | Decommissioning plan has been submitted to NRC. |
| West Virginia University (NRC). Morgantown, WV | | 59 00 | 72 00 | AGN-211-103. Homog. solid, pool. AGN | |
| William Marsh Rice University (NRC). Houston, TX | | 59 00 | 65 00 | AGN-211-101. Homog. solid, pool. AGN | |
| Wyoming, University of (NRC). Laramie, WY | | 59 00 | 74 00 | L-77. Homogeneous. AI | |

1. MATERIALS PRODUCTION

PART II PRODUCTION REACTORS

| Name (all owned by DOE) | Designation | Location | Nuclear designer | Type | Authorized power kW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Comment |
|-------------------------|-------------|---------------------------------|------------------|-------------|------------------------|-----------------------------|-------------------|---------|
| B Reactor | B Reactor | Richland, WA | Du Pont | Graphite | 44 00 | 68 00 | | |
| C Reactor | C Reactor | Richland, WA | GE | Graphite | 52 00 | 69 00 | | |
| C Reactor | C Reactor | Aiken, SC | Du Pont | Heavy water | 55 00 | 93 00 | | |
| D Reactor | D Reactor | Richland, WA | Du Pont | Graphite | 44 00 | 67 00 | | |
| DR Reactor | DR Reactor | Richland, WA | GE | Graphite | 50 00 | 64 00 | | |
| F Reactor | F Reactor | Richland, WA | Du Pont | Graphite | 45 00 | 65 00 | | |
| H Reactor | H Reactor | Richland, WA | GE | Graphite | 49 00 | 65 00 | | |
| KE Reactor | KE Reactor | Richland, WA | GE | Graphite | 55 00 | 71 00 | | |
| KW Reactor | KW Reactor | Richland, WA | GE | Graphite | 55 00 | 70 00 | | |
| L Reactor | L Reactor | Aiken, SC | Du Pont | Heavy water | 54 00 | 93 00 | | |
| P Reactor | P Reactor | Aiken, SC | Du Pont | Heavy water | 54 00 | 93 00 | | |
| R Reactor | R Reactor | Savannah River Plant, Aiken, SC | Du Pont | Heavy water | 53 00 | 64 00 | | |

2. PROCESS DEVELOPMENT

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

1. DEFENSE POWER-REACTOR APPLICATIONS

A. Remote Installations

Reactors in the Army Power Program are designated to reflect mobility characteristics, power range, development sequence, and field sequence. The first capital letter indicates mobility characteristics: S (stationary operation), not designed for subsequent relocation; P (portable), semimobile, stationary operation, capable of being dismantled and reassembled for use in successive locations; and M (mobile), capable of being moved intact, or virtually intact, for use in successive locations. The second capital letter

indicates the power range as measured by design capacity for continuous operation: L (low) 100 to 1000 kW(e); M (medium), 1000 to 10,000 kW(e); and H (high), 10,000 kW(e) or more. Arabic numerals indicate order in which plants having the same mobility and power characteristics are initiated. If not followed by an additional letter, the designation indicates a prototype or pilot plant. The last capital letter (when present) indicates the alphabetical order in which field plants of a specific type are initiated.

| Name (all owned by DOE). Location | Designation | Power capacity net kW(e) | Authorized power kW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Principal nuclear contractor. Reactor type | Comment |
|--|-------------|--------------------------|------------------------|-----------------------------|-------------------|---|--|
| Portable Medium Power Plant, No. 1. Sundance, WY | PM-1 | 1,000.0 | 9,370.0 | 62 00 | 68 00 | Martin. Pressurized water. | |
| Portable Medium Power Plant, No. 2A. Camp Century, Greenland | PM-2A | 1,560.0 | 10,000.0 | 60 00 | 63 00 | Alco. Pressurized water. | The PM-2A was shut down 7/9/63 and dismantled during 4/64 to 6/64. The reactor vessel was then used by INEL for NDT (nil ductility transition temperature) investigations of materials that had been subjected to long-term irradiation. Defects were sequentially introduced into the vessel wall during a series of tests involving pressure and temperature conditions which exceeded the range permitted in operating nuclear power plants. The final test on 11/18/66 resulted in a brittle fracture under conditions even more severe than those which had been previously predicted to cause failure. The test program confirmed laboratory data on the adequacy of reactor-operating limitations to prevent brittle fracture of a pressure vessel. |

| | | | | | | | |
|---|-------|----------|----------|-------|-------|-------------------------------|--|
| Portable Medium Power Plant, No. 3A. McMurdo Sound, Antarctica | PM-3A | 1,500.0 | 9,510.0 | 62 00 | 73 00 | Martin. Pressurized water. | |
| Stationary Medium Power Plant No. 1. Fort Belvoir, VA | SM-1 | 1,855.0 | 10,000.0 | 57 00 | 73 00 | Alco. Pressurized water. | |
| Stationary Medium Power Plant No. 1A. Fort Greely, AK | SM-1A | 1,650.0 | 20,200.0 | 62 00 | 72 00 | Alco. Pressurized water. | |
| STURGIS Floating Nuclear Power Plant | MH-1A | 10,000.0 | 45,000.0 | 67 00 | 76 00 | Martin. Pressurized water. | The Army made the determination to shut down the SM-1A because the plant's demonstration and R&D missions had been successfully completed and because of the ready availability of cheaper conventional power at the site. |
| | | | | | | | The MH-1A was installed in the STURGIS (formerly the Liberty Ship CHARLES H. CUGLE) at Mobile, AL. Acceptance testing was performed at Fort Belvoir, VA, 4/67 to 6/27/67, when the Army accepted the plant from the contractor. In late 7/68 the plant was deployed to Gatun Lake, Panama Canal Zone, and began producing power to the Panama Canal power grid on 10/5/68. The MH-1A is no longer available for service. |

B. Propulsion (Naval)

SSN, Submarine (Nuclear Propulsion). SSBN, Fleet Ballistic Missile Submarine (Nuclear Propulsion). CGN, Guided Missile Cruiser (Nuclear Propulsion).

| Name (all owned by U.S. Navy) | Designation | Shipbuilder | Start-up | Shut-down | Comment |
|-------------------------------|-------------|------------------------|----------|-----------|--|
| NAUTILUS | SSN571 | Electric Boat (Groton) | 54 00 | 80 00 | |
| SEAWOLF PWR | SSN575 | Electric Boat (Groton) | 60 00 | 86 00 | |
| SEAWOLF Sodium Reactor | SSN575 | Electric Boat (Groton) | 57 00 | 59 00 | |
| SKATE | SSN578 | Electric Boat (Groton) | 57 00 | 85 00 | |
| SWORDFISH | SSN579 | Portsmouth | 58 00 | 87 00 | |
| SARGO | SSN583 | Mare Island | 58 00 | 86 00 | |
| SEADRAGON | SSN584 | Portsmouth | 59 00 | 83 00 | |
| SKIPJACK* | SSN585 | Electric Boat (Groton) | 58 00 | 89 00 | |
| TRITON (2 Reactors) | SSN586 | Electric Boat (Groton) | 59 00 | 68 00 | |
| HALIBUT | SSN587 | Mare Island | 59 00 | 76 00 | |
| SCAMP* | SSN588 | Mare Island | 61 00 | 87 00 | |
| SCORPION | SSN589 | Electric Boat (Groton) | 60 00 | 68 00 | The SCORPION was lost in the Atlantic 5/21/68. |
| SCULPIN | SSN590 | Ingalls | 61 00 | 89 00 | |
| SHARK* | SSN591 | Newport News | 60 00 | 89 00 | |
| SNOOK* | SSN592 | Ingalls | 61 00 | 86 00 | |
| THRESHER | SSN593 | Portsmouth | 61 00 | 63 00 | |
| PERMIT* | SSN594 | Mare Island | 62 00 | 90 00 | |
| PLUNGER* | SSN595 | Mare Island | 62 00 | 89 00 | |
| BARB* | SSN596 | Ingalls | 63 00 | 89 00 | |
| TULLIBEE | SSN597 | Electric Boat (Groton) | 60 00 | 87 00 | |
| GEORGE WASHINGTON* | SSN598 | Electric Boat (Groton) | 59 00 | 84 00 | |
| PATRICK HENRY* | SSN599 | Electric Boat (Groton) | 60 00 | 83 00 | |
| THEODORE ROOSEVELT* | SSBN600 | Mare Island | 60 00 | 81 00 | |
| ROBERT E. LEE* | SSN601 | Newport News | 60 00 | 83 00 | |
| ABRAHAM LINCOLN* | SSBN602 | Electric Boat (Groton) | 60 00 | 81 00 | |
| POLLACK* | SSN603 | NYSC | 63 00 | 88 00 | |
| HADDO* | SSN604 | NYSC | 64 00 | 90 00 | |
| JACK* | SSN605 | Portsmouth | 65 00 | 89 00 | |

1. DEFENSE POWER-REACTOR APPLICATIONS

B. Propulsion (Naval) (Continued)

PART III MILITARY REACTORS

| Name (all owned by U.S. Navy) | Designation | Shipbuilder | Start-up | Shut-down | Comment |
|-------------------------------|-------------|------------------------|----------|-----------|---------|
| TINOSA* | SSN606 | Portsmouth | 63 00 | 91 00 | |
| DACE* | SSN607 | Ingalls | 63 00 | 88 00 | |
| ETHAN ALLEN* | SSN608 | Electric Boat (Groton) | 61 00 | 82 00 | |
| SAM HOUSTON* | SSN609 | Newport News | 61 00 | 91 00 | |
| THOMAS A. EDISON* | SSN610 | Electric Boat (Groton) | 61 00 | 83 00 | |
| JOHN MARSHALL* | SSN611 | Newport News | 62 00 | 92 00 | |
| GUARDFISH* | SSN612 | NYSC | 66 00 | 91 00 | |
| FLASHER* | SSN613 | Electric Boat (Groton) | 66 00 | 91 00 | |
| GREENLING | SSN614 | GD (Quincy) | 67 00 | 93 00 | |
| LAFAYETTE* | SSBN616 | Electric Boat (Groton) | 63 00 | 91 00 | |
| ALEXANDER HAMILTON* | SSBN617 | Electric Boat (Groton) | 63 00 | 92 00 | |
| THOMAS JEFFERSON* | SSN618 | Newport News | 62 00 | 84 00 | |
| ANDREW JACKSON | SSBN619 | Mare Island | 63 00 | 88 00 | |
| JOHN ADAMS* | SSBN620 | Portsmouth | 64 00 | 88 00 | |
| HADDOCK | SSN621 | Ingalls | 67 00 | 92 00 | |
| JAMES MONROE* | SSBN622 | Newport News | 63 00 | 90 00 | |
| NATHAN HALE* | SSBN623 | Electric Boat (Groton) | 63 00 | 86 00 | |
| WOODROW WILSON | SSBN624 | Mare Island | 63 00 | 93 00 | |
| HENRY CLAY | SSBN625 | Newport News | 63 00 | 90 00 | |
| JAMES MADISON | SSBN627 | Newport News | 64 00 | 92 00 | |
| TECUMSEH | SSBN628 | Electric Boat (Groton) | 64 00 | 93 00 | |
| DANIEL BOONE | SSBN629 | Mare Island | 63 00 | 93 00 | |
| JOHN C. CALHOUN | SSBN630 | Newport News | 64 00 | 93 00 | |
| ULYSSES S. GRANT* | SSBN631 | Electric Boat (Groton) | 64 00 | 92 00 | |
| VON STEUBEN | SSBN632 | Newport News | 64 00 | 93 00 | |
| CASIMIR PULASKI | SSBN633 | Electric Boat (Groton) | 64 00 | 93 00 | |
| NATHANAEL GREENE | SSBN636 | Portsmouth | 64 00 | 86 00 | |
| BENJAMIN FRANKLIN | SSBN640 | Electric Boat (Groton) | 65 00 | 93 00 | |
| GEORGE BANCROFT | SSBN643 | Electric Boat (Groton) | 65 00 | 93 00 | |
| LEWIS AND CLARK | SSBN644 | Newport News | 65 00 | 91 00 | |
| QUEENFISH* | SSN651 | Newport News | 66 00 | 90 00 | |
| RAY | SSN653 | Newport News | 67 00 | 92 00 | |
| GEORGE C. MARSHALL* | SSBN654 | Newport News | 66 00 | 92 00 | |
| HENRY L. STIMSON | SSBN655 | Electric Boat (Groton) | 66 00 | 92 00 | |
| GEORGE WASHINGTON | SSBN656 | Newport News | 66 00 | 92 00 | |
| CARVER* | SSBN657 | Electric Boat (Groton) | 66 00 | 93 00 | |
| FRANCIS SCOTT KEY | SSBN659 | Electric Boat (Groton) | 67 00 | 92 00 | |
| WILL ROGERS | SSN661 | Newport News | 67 00 | 91 00 | |
| LAPON | SSN664 | Newport News | 68 00 | 91 00 | |
| SEA DEVIL | SSN665 | Mare Island | 72 00 | 91 00 | |
| GUITARRO* | SSN685 | Electric Boat (Groton) | 74 00 | 90 00 | |
| GLENARD P. LIPSCOMB* | SSN687 | Newport News | 74 00 | 93 00 | |
| RICHARD B. RUSSELL | SSN689 | Newport News | 77 00 | 93 00 | |
| BATON ROUGE | CGN39 | Newport News | 77 00 | 93 00 | |
| TEXAS (2 reactors) | | | | | |

*The defueled reactor compartment has been removed and placed in a government burial ground.

2. DEVELOPMENTAL POWER

A. Electric-Power Experiments and Prototypes

| Name (owner). Location | Designation | Power capacity net kW(e) | Authorized power kW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Reactor type. Principal nuclear contractor | Comment |
|--|-------------|--------------------------------|------------------------------|-----------------------------------|-------------------------|---|------------------------------|
| Gas Cooled Reactor Experiment (DOE). INEL Site, ID | GCRE | | 2,200.0 | 60 00 | 62 00 | Gas cooled, light water moderated. AGN | No electricity was produced. |
| Mobile Low Power Plant No. 1 (DOE). INEL Site, ID | ML-1 | 300.0 | 3,300.0 | 61 00 | 65 00 | Gas cooled, light water moderated. AGN | |
| Stationary Low Power Plant No. 1 (DOE). INEL Site, ID | SL-1 | 300.0 | 2,200.0 | 58 00 | 61 00 | Boiling water. ANL | |

B. Propulsion Experiments and Prototypes

| | | | | | | | |
|---|----------|--|-----------|-------|-------|-----------------------------|--|
| Aircraft Reactor Experiment (DOE). Oak Ridge, TN | ARE | | 1,500.0 | 54 00 | 54 00 | Molten salt. ORNL | |
| Experimental Propulsion Test Reactor (DOE). NTS, NV | TORY IIA | | 150,000.0 | 60 00 | 61 00 | Air cooled. LLNL | |
| Experimental Propulsion Test Reactor (DOE). NTS, NV | TORY IIC | | 600,000.0 | 64 00 | 64 00 | Air cooled. LLNL | The TORY IIC was successfully tested at full design power during 5/64. Subsequent to cancellation of the Pluto program 7/1/64, the reactor was placed in the Pluto disassembly building at NST for storage. In 1974 the reactor was transferred to the NERVA disassembly area for disassembly. |
| Heat Transfer Reactor Experiment No. 1 (DOE). INEL Site, ID | HTRE-1 | | 20,000.0 | 56 00 | 57 00 | Air cooled. ANPD | |
| Heat Transfer Reactor Experiment No. 2 (DOE). INEL Site, ID | HTRE-2 | | 14,000.0 | 57 00 | 61 00 | Air cooled. ANPD | |
| Heat Transfer Reactor Experiment No. 3 (DOE). INEL Site, ID | HTRE-3 | | 32,000.0 | 58 00 | 61 00 | Air cooled. ANPD | |
| Small Submarine Reactor Prototype (DOE). Windsor, CT | SIC | | | 59 00 | 93 00 | Pressurized water. GE | |
| Submarine Advanced Reactor Prototype (DOE). West Milton, NY | S3G | | | 58 00 | 91 00 | Pressurized water. GE | |
| Submarine Intermediate Reactor Mark A (DOE). West Milton, NY | S1G | | | 55 00 | 57 00 | Sodium. GE | |
| Submarine Thermal Reactor Facility (DOE). INEL Site, ID | S1W | | | 53 00 | 89 10 | Pressurized water. West. | |

3. TEST AND RESEARCH

A. Test

| | | | | | | |
|--|------|----------|-------|-------|----------------|---|
| Aerospace Systems Test Reactor (USAF). Fort Worth, TX | ASTR | 10,000.0 | 54 00 | 71 00 | LWR. Convair | Defueled in 1971; decommissioning began in 1973 and was completed in 1974. |
| Ground Test Reactor (USAF). Fort Worth, TX | GTR | 10,000.0 | 53 00 | 73 00 | Pool. Convair | Decommissioning began in 1973 and was completed in 1974. |
| Nuclear Engineering Test Reactor (USAF). Dayton, OH | NETR | 10,000.0 | 65 00 | 70 00 | Tank. Maxon-AC | |

3. TEST AND RESEARCH

B. Research

| Name (owner). Location | Designation | Power capacity net kW(e) | Authorized power kW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Reactor type. Principal nuclear contractor | Comment |
|--|-------------|--------------------------|------------------------|-----------------------------|-------------------|--|---|
| Army Materials Research Reactor (USA). Regulated by NRC. Watertown, MA | AMRR | | 5,000.0 | 60 00 | 70 00 | Pool. BAC | Army Materials and Mechanics Research Center. License terminated 10/5/93. |
| Diamond Ordnance Radiation Facility (USA). Forest Glen, MD | DORF | | 250.0 | 61 00 | 77 00 | TRIGA-Mk F. GA | Harry Diamond Laboratories. |
| Naval Research Reactor (USN). Regulated by NRC. Washington, DC | NRR | | 1,000.0 | 56 00 | 70 00 | Pool. NRL | |
| Nuclear Effects Reactor (DOE). NTS, NV | Super KUKLA | | | 64 00 | 79 00 | Prompt burst. LLNL | Standby fuel in storage at ORNL. |
| Thermal Test Reactor No. 1 (DOE). Schenectady, NY | TTR-1 | | 10.0 | 51 00 | 83 00 | Graphite. KAPL | |
| Walter Reed Research Reactor (USA). Regulated by NRC. Washington, DC | WRRR | | 50.0 | 62 00 | 70 00 | Homogeneous. AI | Walter Reed Army Institute of Research. |

1. POWER REACTORS

A. Central-Station Electric Power Plants

| Reactor Name (Owner). Location | NRC export license No. and date | Principal nuclear contractor. Reactor type | Power design net MW(e) | Power MW(t) | Authorized power kW(t) | Initial criticality (yr mo) | Shut-down (yr mo) | Comment |
|---|---------------------------------|--|------------------------|-------------|------------------------|-----------------------------|-------------------|-----------------------------|
| France (Franco-Belgian Society for Nuclear Energy of Ardennes, SENA). Chooz | | West./Fram., ACEC. | 305.0 | 1,040.0 | | 67 00 | 91 10 | Decommissioning in process. |
| Germany, Kahl Nuclear Power Station (Rhine-Westphalia Power Co., RWE). Kahl-am-Main | XR-031 09/30/59 | GE. Boiling water | 15.6 | 60.0 | | 61 00 | 85 00 | |
| Germany (Kernkraftwerk-RWE-Bayenwerk, KRB1). Gundremmingen (near Gunzburg) | XR-052 05/28/64 | GE. Boiling water | 237.0 | 801.0 | | 67 00 | 80 00 | |
| Italy, Garigliano Nuclear Power Station (Project ENEL of SENN). Punta Fiume (on Garigliano River) | XR-043 08/16/61 | GE. Boiling water | 150.0 | 506.0 | | 64 00 | 78 00 | |
| Japan, Japan Power Demonstration Reactor (JAERI). Tokai-Mura, Ibaraki Pref. | XR-045 03/16/62 | GE. Boiling water | 12.0 | 90.0 | | 63 00 | 83 00 | |

B. Propulsion

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

PART III MILITARY REACTORS

PART IV EXPORT REACTORS

2. TEST, RESEARCH, AND TEACHING

A. General Irradiation Test

(No reactors currently in this category)

B. General Research

| | | | | | | | |
|---|--------------------|--------------------------|------|---------|-------|-------|--|
| Belgium, BR-3, Mol (AMITAS). Mol | XR-024 11/06/58 | Pressurized water | 10.5 | | | | The reactor contains some fuel and is still under IAEA jurisdiction. |
| Denmark, DR-2 (Risø National Laboratory). Risø | XR-006 04/04/57 | FW. Tank | | 5,000.0 | 58.00 | 75.00 | |
| Germany, PRG-1 (GKSS-Forschungszentrum Geesthacht G.m.b.H.). Geesthacht | XR-008 06/10/57 | B&W. Research Reactor | | 5,000.0 | 58.10 | n.d. | |
| Italy (Center for Military Application of Nuclear Energy). Near Pisa | XR-036 12/17/59 | B&W. Pool | | | 63.00 | 80.00 | Power: Pulsing. |
| Italy (European Community Commission). Ispra | XR-007 05/17/57 | AC. Heavy water, tank | | 5,000.0 | 59.00 | 89.00 | |
| Italy (Fiat TTG). Saluggia | XR-016 12/06/57 | AMF. Pool | | 7,000.0 | 59.00 | 73.00 | |
| Italy (Italian Agency for New Technology, Energy and the Environment). Casaccia | XR-051 04/20/64 | AMF. Pool | | | 71.00 | 79.00 | Negligible power. |
| Japan (Japan Atomic Energy Research Institute). Tokai-Mura, Ibaraki Pref. | XR-001 11/02/56 | AL L-54 | | 50.0 | 57.00 | 69.00 | |
| Vietnam (Vietnam Institute of Nuclear Research). Dalat | XR-032 10/10/59 | GA. TRIGA-Mk II | | 250.0 | 63.00 | 73.00 | |
| West Berlin, City of (Institute for Nuclear Research). West Berlin | XR-012 09/07/57 | AL L-54 | | 50.0 | 58.00 | 70.00 | |

C. University Research and Teaching

| | | | | | | |
|--|--------------------|---------------------|---------|-------|-------|---|
| Germany (Association for Radiation Research). Munich | XR-075 01/14/71 | GA. TRIGA-Mk III | 1,000.0 | 72 00 | 82 00 | This reactor was sold through Gulf Oil licensee, Gutehoffnungshutte Sterkrade A.E. |
| Germany (Brown Boveri/Krupp). Jülich | XR-062 07/28/66 | AL L-77A | | 64 00 | 77 00 | 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, 10/61; in Athens, Greece, 5/62, and in Bangkok, Thailand, 11/62. |
| Germany (Universities of Frankfurt and Darmstadt). Frankfurt | XR-009 05/01/57 | AL L-54 | 50.0 | 58 00 | 68 00 | |
| Italy (University of Milan). Milan | XR-022 08/13/58 | AL L-54 | 50.0 | 59 00 | 86 00 | |
| Switzerland (University of Geneva). Geneva | | AGN. AGN-201-111 | | 58 00 | 87 00 | Negligible power. The AGN-201-111 was operated first in the USAEC Atoms for Peace Exhibit in Rome, Italy, 7/58, and later in the commercial exhibit of the 1958 International Conference in Geneva prior to transfer to the University of Geneva. |
| United Kingdom (Queen Mary College, London University). London | XR-049 02/13/64 | AS Inc. UTR-B | 100.0 | 65 00 | 82 00 | |

PART V CRITICAL ASSEMBLIES

1. CIVILIAN

| Facility (Regulatory Agency) | Designation | Location | Equipment | | | | Comment |
|--|-------------|------------------|--------------|--------------------------|----------------|-----------------------------|--|
| | | | No. of cells | No. control pencils/room | Abbreviation | Initial criticality (yr mo) | |
| Argonne National Laboratory (DOE) | ZPR-6 | Argonne, IL | 2 | 2 | ANL | 63 00 | \$2 00 |
| Argonne National Laboratory (DOE) | ZPR-9 | Argonne, IL | 2 | 2 | ANL | 67 00 | \$2 00 |
| | | | | | | | Basic fast reactor studies and mock-up for LMFBR. |
| | | | | | | | Basic fast reactor studies and mock-up for LMFBR. |
| | | | | | | | Zero-power experiments of historical interest previously conducted in ANL facility cells include the NAUTILUS core design (ZPR-1), the Savannah River reactor design (ZPR-2), and a series of fast-neutron studies (ZPR-4) and interactions between two basic systems (ZPR-5). The following experiments were performed in the ZPR-7 facility: thorium, uranium, deuterium criticals (THUD), and a series of flux-trap criticals for the Argonne High Flux Research Reactor. |
| Bettis Atomic Power Laboratory (DOE) | LWBCC | Pittsburgh, PA | 3 | 3 | Bettis | 65 00 | 80 00 |
| Critical Facility-10, Lynchburg Research Center (NRC) | SSRF | Lynchburg, VA | 2 | 1 | CX-10 | 77 00 | 88 02 |
| Los Alamos National Laboratory (DOE) | Parus | Los Alamos, NM | 3 | 3 | LANL, Kiva III | 63 00 | 85 00 |
| Los Alamos National Laboratory (DOE) | Venus | Los Alamos, NM | 1 | 1 | LANL, Kiva I | 76 00 | 88 00 |
| Oak Ridge Critical Experiments Facility (DOE) | CEF | Oak Ridge, TN | 1 | 1 | OR-CEF | 50 00 | 92 00 |
| ORNL Pool Critical Assembly, BSF Pool (DOE) | PCA | Oak Ridge, TN | 1 | 1 | ORNL-PCA | 58 00 | 92 00 |
| PNL Critical Mass Laboratory (DOE) | FEAS | Hanford Site, WA | 1 | 1 | PNL-CML | 76 00 | 90 00 |
| | | | | | | | Shut down—Defueled. |
| | | | | | | | Shut down—To be defueled. |
| | | | | | | | The Critical Mass Laboratory was used to experiment with liquid plutonium solutions. It was shut down in 1990 and transferred to the surplus facilities program for decontamination and decommissioning. |
| PNL Critical Mass Laboratory (DOE) | Horizontal | Hanford Site, WA | 1 | 1 | PNL-CML | 61 00 | 90 00 |
| PNL Critical Mass Laboratory (DOE) | RSTM | Hanford Site, WA | 1 | 1 | PNL-CML | 63 00 | 90 00 |
| United Nuclear Corporation, Development Division (NRC) | PTF | Pawling, NY | 4 | 3 | UNC | 67 00 | 72 00 |
| | | | | | | | See FEAS reactor. |
| | | | | | | | See FEAS reactor. |
| | | | | | | | Proff test facility. Material license (SNM-871) terminated 7/14/75. |

2. MILITARY

| | | | | | | |
|--|-----------------------|-----------------|----------|-------|-------|---|
| Bettis Atomic Power Laboratory (DOE) | HTTF | Pittsburgh, PA | Bettis | 59 00 | 84 00 | Surface-ship physics. |
| Bettis Atomic Power Laboratory (DOE) | SS-CF | Pittsburgh, PA | Bettis | 57 00 | 76 00 | Surface-ship physics. |
| Knolls Atomic Power Laboratory (DOE) | FPR | Schenectady, NY | KAPL | 56 00 | 75 00 | Flexible critical experiments. |
| Knolls Atomic Power Laboratory (DOE) | PTR | Schenectady, NY | KAPL | 58 00 | 76 00 | High-temperature high-pressure physics and mock-up. |
| Lockheed Aircraft Co., Critical Facility for RER (NRC) | CERF | Dawsonville, GA | Lockheed | 58 00 | 60 09 | |
| Nuclear Safety Facility, Rocky Flats Plant (DOE) | Vertical/ Split Table | Golden, CO | RFP-NSF | 65 00 | 92 00 | Critical-configuration safety tests. |
| Nuclear Safety Facility, Rocky Flats Plant (DOE) | Water Reflector Tank | Golden, CO | RFP-NSF | 65 00 | 92 00 | Critical-configuration safety tests. |

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REACTOR INDEX

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