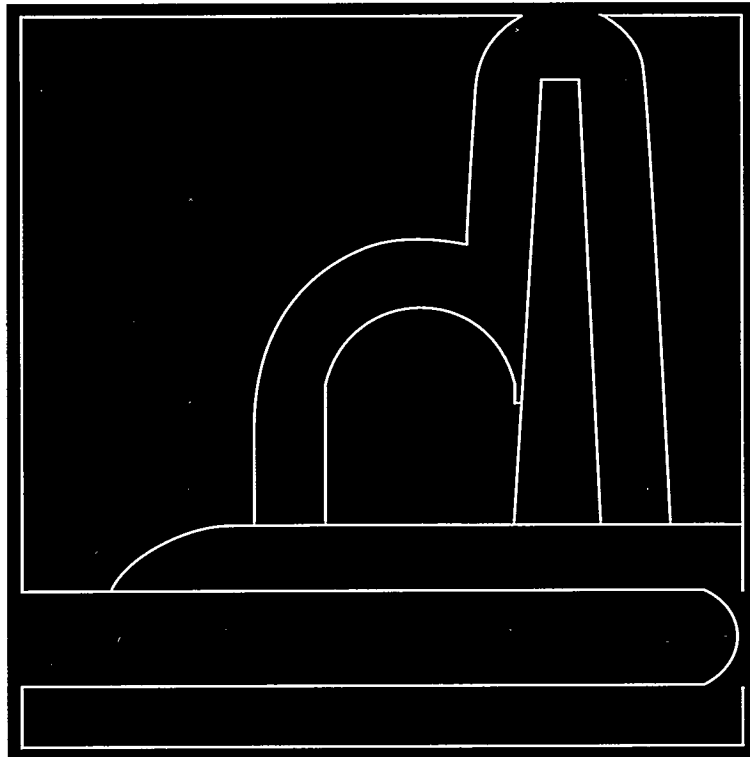


# Nuclear Reactors Built, Being Built, or Planned: 1995



Prepared for:  
**U.S. DEPARTMENT OF ENERGY**  
Director, Office of Nuclear Energy,  
Science and Technology

Prepared by:  
**Office of Scientific and  
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# Nuclear Reactors Built, Being Built, or Planned 1995

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Prepared for:

**U.S. DEPARTMENT OF ENERGY**

**Director, Office of Nuclear Energy,  
Science and Technology**

**Washington, D.C. 20585**

MASTER

Prepared by:

**Office of Scientific and  
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## Preface

*Nuclear Reactors Built, Being Built, or Planned* contains unclassified information about facilities built, being built, or planned in the United States for domestic use or export as of December 31, 1995. 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-R59) is sponsored by the DOE Office of Nuclear Energy, Science and Technology, 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 Janice Pitsenbarger, U.S. Department of Energy, Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831; (423) 576-5636. 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 ( <i>No reactors currently in this category</i> )               | 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                                                | 6 |
| A. General Irradiation Test                                                               | 6 |
| B. High-Power Research and Test                                                           | 7 |
| C. Safety Research and Test ( <i>No reactors currently in this category</i> )             | 7 |
| D. General Research                                                                       | 7 |
| E. University Research and Teaching                                                       | 8 |

### Part II. Production Reactors

|                                                                          |    |
|--------------------------------------------------------------------------|----|
| 1. Materials Production                                                  | 10 |
| 2. Process Development ( <i>No reactors currently in this category</i> ) | 10 |

## CONTENTS (Continued)

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|                                                                                                |    |
|------------------------------------------------------------------------------------------------|----|
| <b>Part III. Military Reactors</b>                                                             |    |
| 1. Defense Power-Reactor Applications                                                          | 11 |
| A. Remote Installations ( <i>No reactors currently in this category</i> )                      | 11 |
| B. Propulsion (Naval)                                                                          | 11 |
| 2. Developmental Power                                                                         | 14 |
| A. Electric-Power Experiments and Prototypes ( <i>No reactors currently in this category</i> ) | 14 |
| B. Propulsion Experiments and Prototypes                                                       | 14 |
| 3. Test and Research                                                                           | 14 |
| A. Test ( <i>No reactors currently in this category</i> )                                      | 14 |
| B. Research                                                                                    | 15 |
| <b>Part IV. Export Reactors</b>                                                                |    |
| 1. Power Reactors                                                                              | 15 |
| A. Central-Station Electric Power Plants                                                       | 15 |
| B. Propulsion ( <i>No reactors currently in this category</i> )                                | 19 |
| 2. Test, Research, and Teaching                                                                | 19 |
| A. General Irradiation Test                                                                    | 19 |
| B. General Research                                                                            | 19 |
| C. University Research and Teaching                                                            | 21 |
| <b>Part V. Critical Assemblies</b>                                                             |    |
| 1. Civilian                                                                                    | 22 |
| 2. Military                                                                                    | 23 |

## REACTORS AND FACILITIES SHUTDOWN OR DISMANTLED

|                                             |    |
|---------------------------------------------|----|
| <b>Part I. Civilian Reactors (Domestic)</b> |    |
| 1. Power Reactors                           | 27 |
| A. Central-Station Electric Power Plants    | 27 |
| B. Dual-Purpose Plants                      | 28 |
| C. Propulsion (Maritime)                    | 29 |
| 2. Experimental Power-Reactor Systems       | 29 |
| A. Electric-Power Systems                   | 29 |
| B. Space Nuclear Auxiliary Power (SNAP)     | 31 |
| C. Space Propulsion                         | 32 |
| 3. Test, Research, and University Reactors  | 33 |
| A. General Irradiation Test                 | 33 |
| B. High-Power Research and Test             | 34 |
| C. Safety Research and Test                 | 34 |
| D. General Research                         | 35 |
| E. University Research and Teaching         | 39 |

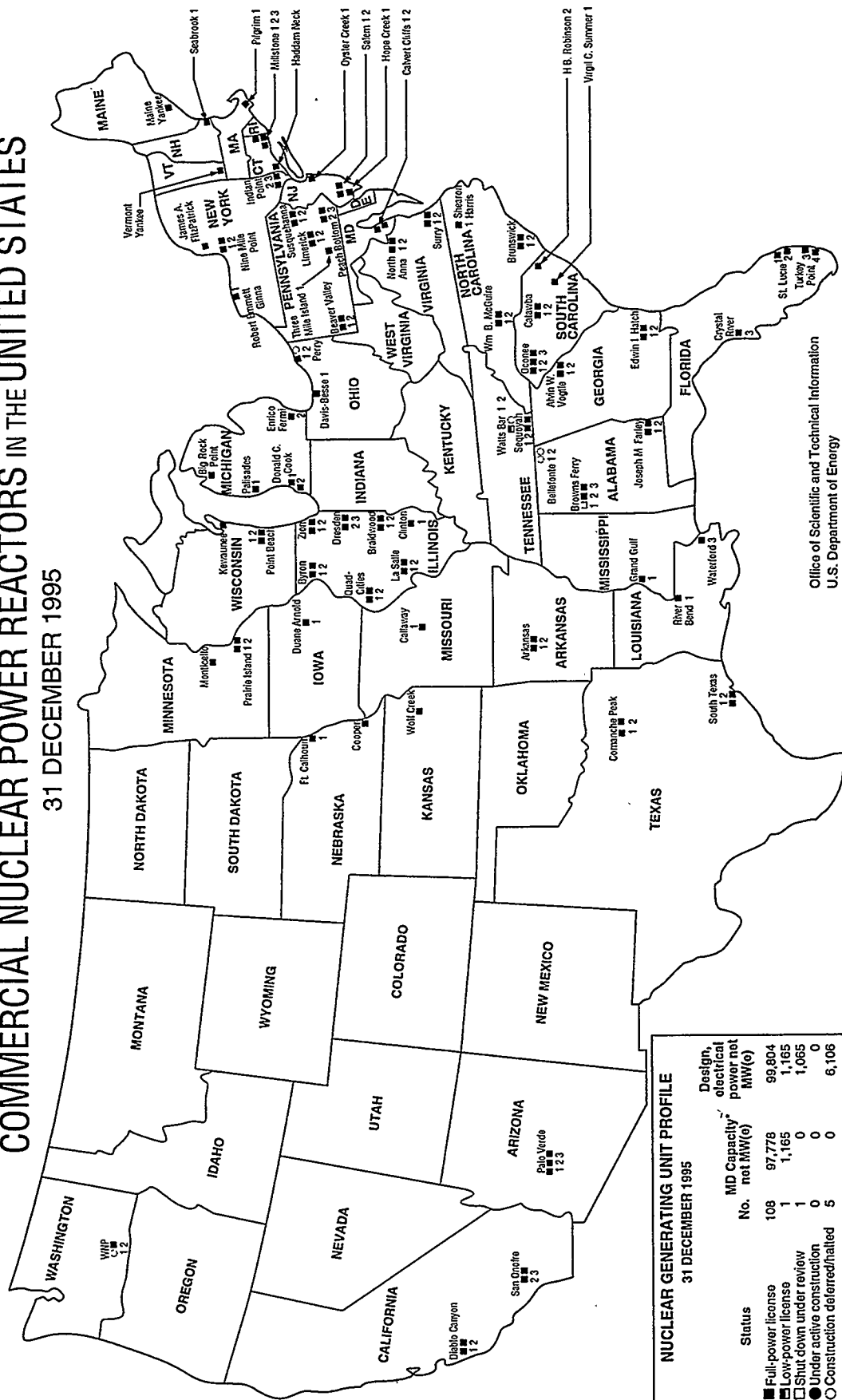
## CONTENTS (Continued)

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| B. Propulsion (Naval)                                                         | 43 |
| 2. Developmental Power                                                        | 45 |
| A. Electric-Power Experiments and Prototypes                                  | 45 |
| B. Propulsion Experiments and Prototypes                                      | 45 |
| 3. Test and Research                                                          | 46 |
| A. Test                                                                       | 46 |
| B. Research                                                                   | 46 |
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| B. Propulsion                                                                 | 47 |
| 2. Test, Research, and Teaching                                               | 47 |
| A. General Irradiation Test ( <i>No reactors currently in this category</i> ) | 47 |
| B. General Research                                                           | 47 |
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| 1. Civilian                                                                   | 48 |
| 2. Military                                                                   | 48 |
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# COMMERCIAL NUCLEAR POWER REACTORS IN THE UNITED STATES

31 DECEMBER 1995



| NUCLEAR GENERATING UNIT PROFILE |     |                           |                                            |
|---------------------------------|-----|---------------------------|--------------------------------------------|
| 31 DECEMBER 1995                |     |                           |                                            |
| Status                          | No. | MD Capacity*<br>net MW(e) | Design<br>electrical<br>power net<br>MW(e) |
| ■ Full-power license            | 108 | 97,778                    | 99,804                                     |
| ■ Low-power license             | 1   | 1,165                     | 1,165                                      |
| ■ Shut down under review        | 1   | 0                         | 1,065                                      |
| ● Under active construction     | 0   | 0                         | 0                                          |
| ○ Construction deferred/halted  | 5   | 0                         | 6,106                                      |
| Total                           | 115 | 98,943                    | 108,140                                    |

\*Maximum Dependable Capacity or Design Electrical Rating

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

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TABLE 1

## COMMERCIAL NUCLEAR POWER REACTORS IN THE UNITED STATES AS OF 31 DEC 1995

| SITE               | PLANT NAME                                    | STATUS | CAPACITY,<br>NET MW(e) | DESIGN<br>ELECTRICAL<br>RATING,<br>NET MW(e) | LICENSEE                            | STARTUP |
|--------------------|-----------------------------------------------|--------|------------------------|----------------------------------------------|-------------------------------------|---------|
| <b>ALABAMA</b>     |                                               |        |                        |                                              |                                     |         |
| 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    | FPL    | 1,065                  | 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.  |
| Total              |                                               |        | 3,764                  | 7,323                                        |                                     |         |
| <b>ARIZONA</b>     |                                               |        |                        |                                              |                                     |         |
| 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   |
| Total              |                                               |        | 3,746                  | 3,810                                        |                                     |         |
| <b>ARKANSAS</b>    |                                               |        |                        |                                              |                                     |         |
| 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   |
| Total              |                                               |        | 1,694                  | 1,762                                        |                                     |         |
| <b>CALIFORNIA</b>  |                                               |        |                        |                                              |                                     |         |
| 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   |
| Total              |                                               |        | 4,310                  | 4,355                                        |                                     |         |
| <b>CONNECTICUT</b> |                                               |        |                        |                                              |                                     |         |
| 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   |
| Total              |                                               |        | 3,211                  | 3,266                                        |                                     |         |

TABLE 1 (Continued)

| SITE             | PLANT NAME                               | STATUS | CAPACITY,<br>NET MW(e) | DESIGN<br>ELECTRICAL<br>RATING,<br>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,<br>Unit 3   | FPL    | 821                    | 825                                          | Florida Power Corp.                   | 77 01   |
| Total            |                                          |        | 3,831                  | 3,871                                        |                                       |         |
| GEORGIA          |                                          |        |                        |                                              |                                       |         |
| Baxley           | Edwin I. Hatch Nuclear Plant,<br>Unit 1  | FPL    | 737                    | 776                                          | Georgia Power Co.                     | 74 09   |
| Baxley           | Edwin I. Hatch Nuclear Plant,<br>Unit 2  | FPL    | 757                    | 784                                          | Georgia Power Co.                     | 78 07   |
| Waynesboro       | Alvin W. Vogtle Nuclear Plant,<br>Unit 1 | FPL    | 1,158                  | 1,101                                        | Georgia Power Co.                     | 87 03   |
| Waynesboro       | Alvin W. Vogtle Nuclear Plant,<br>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,<br>Unit 2 | FPL    | 772                    | 794                                          | Commonwealth Edison Co.               | 70 01   |
| Morris           | Dresden Nuclear Power Station,<br>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,<br>Unit 1    | FPL    | 515                    | 538                                          | Iowa Electric Light &<br>Power Co.    | 74 03   |
| Total            |                                          |        | 515                    | 538                                          |                                       |         |
| KANSAS           |                                          |        |                        |                                              |                                       |         |
| Burlington       | Wolf Creek Generating Station            | FPL    | 1,134                  | 1,170                                        | Wolf Creek Nuclear Operating<br>Corp. | 85 05   |
| Total            |                                          |        | 1,134                  | 1,170                                        |                                       |         |
| LOUISIANA        |                                          |        |                        |                                              |                                       |         |
| St. Francisville | River Bend Station, Unit 1               | FPL    | 936                    | 936                                          | Entergy Operations Inc.               | 85 10   |
| Taft             | Waterford Generating Station,<br>Unit 3  | FPL    | 1,075                  | 1,104                                        | Entergy Operations Inc.               | 85 03   |
| Total            |                                          |        | 2,011                  | 2,040                                        |                                       |         |

TABLE 1 (Continued)

| SITE                 | PLANT NAME                                      | STATUS | CAPACITY,<br>NET MW(e) | DESIGN<br>ELECTRICAL<br>RATING,<br>NET MW(e) | LICENSEE                          | STARTUP |
|----------------------|-------------------------------------------------|--------|------------------------|----------------------------------------------|-----------------------------------|---------|
| <b>MAINE</b>         |                                                 |        |                        |                                              |                                   |         |
| Wiscasset            | Maine Yankee Atomic Power Plant                 | FPL    | 860                    | 870                                          | Maine Yankee Atomic Power Co.     | 72 10   |
| Total                |                                                 |        | 860                    | 870                                          |                                   |         |
| <b>MARYLAND</b>      |                                                 |        |                        |                                              |                                   |         |
| Lusby                | Calvert Cliffs Nuclear Power Plant, Unit 1      | FPL    | 830                    | 845                                          | Baltimore Gas & Electric Co.      | 74 10   |
| Lusby                | Calvert Cliffs Nuclear Power Plant, Unit 2      | FPL    | 830                    | 845                                          | Baltimore Gas & Electric Co.      | 76 11   |
| Total                |                                                 |        | 1,660                  | 1,690                                        |                                   |         |
| <b>MASSACHUSETTS</b> |                                                 |        |                        |                                              |                                   |         |
| Plymouth             | Pilgrim Nuclear Power Station, Unit 1           | FPL    | 670                    | 655                                          | Boston Edison Co.                 | 72 06   |
| Total                |                                                 |        | 670                    | 655                                          |                                   |         |
| <b>MICHIGAN</b>      |                                                 |        |                        |                                              |                                   |         |
| Big Rock Point       | Big Rock Point Nuclear Plant                    | FPL    | 67                     | 72                                           | Consumers Power Co.               | 62 09   |
| Bridgman             | Donald C. Cook Nuclear Power Plant, Unit 1      | FPL    | 1,000                  | 1,020                                        | Indiana and Michigan Electric Co. | 75 01   |
| 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                                        |                                   |         |
| <b>MINNESOTA</b>     |                                                 |        |                        |                                              |                                   |         |
| Monticello           | Monticello Nuclear Generating Plant             | FPL    | 536                    | 545                                          | Northern States Power Co.         | 70 12   |
| Red Wing             | Prairie Island Nuclear Generating Plant, Unit 1 | FPL    | 513                    | 530                                          | Northern States Power Co.         | 73 12   |
| Red Wing             | Prairie Island Nuclear Generating Plant, Unit 2 | FPL    | 512                    | 530                                          | Northern States Power Co.         | 74 12   |
| Total                |                                                 |        | 1,561                  | 1,605                                        |                                   |         |
| <b>MISSISSIPPI</b>   |                                                 |        |                        |                                              |                                   |         |
| Port Gibson          | Grand Gulf Nuclear Station, Unit 1              | FPL    | 1,143                  | 1,250                                        | Entergy Operations Inc.           | 82 08   |
| Total                |                                                 |        | 1,143                  | 1,250                                        |                                   |         |
| <b>MISSOURI</b>      |                                                 |        |                        |                                              |                                   |         |
| Fulton               | Callaway Plant, Unit 1                          | FPL    | 1,120                  | 1,171                                        | Union Electric Co.                | 84 10   |
| Total                |                                                 |        | 1,120                  | 1,171                                        |                                   |         |
| <b>NEBRASKA</b>      |                                                 |        |                        |                                              |                                   |         |
| Brownville           | Cooper Nuclear Station                          | FPL    | 764                    | 778                                          | Nebraska Public Power District    | 74 02   |
| Fort Calhoun         | Fort Calhoun Station, Unit 1                    | FPL    | 478                    | 478                                          | Omaha Public Power District       | 73 08   |
| Total                |                                                 |        | 1,242                  | 1,256                                        |                                   |         |

TABLE 1 (Continued)

| SITE            | PLANT NAME                                      | STATUS | CAPACITY,<br>NET MW(e) | DESIGN<br>ELECTRICAL<br>RATING,<br>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,<br>NET MW(e) | DESIGN<br>ELECTRICAL<br>RATING,<br>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          | Sequoyah Nuclear Plant, Unit 1               | FPL    | 1,122                  | 1,148                                        | Tennessee Valley Authority         | 80 07   |
| Daisy          | Sequoyah Nuclear Plant, Unit 2               | FPL    | 1,122                  | 1,148                                        | Tennessee Valley Authority         | 81 11   |
| Spring City    | Watts Bar Nuclear Plant, Unit 1              | LPL    | 1,165                  | 1,165                                        | Tennessee Valley Authority         | 95 11   |
| Spring City    | Watts Bar Nuclear Plant, Unit 2              | CDH    |                        | 1,165                                        | Tennessee Valley Authority         | Indef.  |
| Total          |                                              |        | 3,409                  | 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        |                                              |        |                        |                                              |                                    |         |
| Vernon         | 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,<br>NET MW(e) | DESIGN<br>ELECTRICAL | LICENSEE                                 | STARTUP |
|-------------|---------------------------------------|--------|------------------------|----------------------|------------------------------------------|---------|
|             |                                       |        |                        | RATING,<br>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,<br>Unit 1 | CDH    |                        | 1,266                | Washington Public Power<br>Supply System | Indef.  |
| Richland    | Washington Nuclear Project,<br>Unit 2 | FPL    | 1,086                  | 1,100                | Washington Public Power<br>Supply System | 84 01   |
| Total       |                                       |        | 1,086                  | 2,366                |                                          |         |
| WISCONSIN   |                                       |        |                        |                      |                                          |         |
| Carlton     | Kewaunee Nuclear Power Plant          | FPL    | 511                    | 535                  | Wisconsin Public Service Corp.           | 74 03   |
| Two Creeks  | Point Beach Nuclear Plant,<br>Unit 1  | FPL    | 485                    | 497                  | Wisconsin Electric Power Co.             | 70 11   |
| Two Creeks  | Point Beach Nuclear Plant,<br>Unit 2  | FPL    | 485                    | 497                  | Wisconsin Electric Power Co.             | 72 05   |
| Total       |                                       |        | 1,481                  | 1,529                |                                          |         |
| U.S. Total  |                                       |        | 98,943                 | 108,140              |                                          |         |

FPL, Full-Power License  
 LPL, Low-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 1995**

|                                           | Operable   | Being<br>built | Planned  | Shutdown   | Totals     |
|-------------------------------------------|------------|----------------|----------|------------|------------|
| <b>U.S. REACTORS</b>                      |            |                |          |            |            |
| <b>CIVILIAN REACTORS (DOMESTIC)</b>       |            |                |          |            |            |
| Power Reactors                            |            |                |          |            |            |
| Central-Station Electric Power Plants     | 109        | 5              |          | 20         | 134        |
| Dual-Purpose Plants                       |            |                |          | 1          | 1          |
| Propulsion (Maritime)                     |            |                |          | 1          | 1          |
| Experimental Power-Reactor Systems        |            |                |          |            |            |
| Electric-Power Systems                    |            |                |          | 24         | 24         |
| Space Nuclear Auxiliary Power (SNAP)      |            |                |          | 9          | 9          |
| Space Propulsion (Rover)                  |            |                |          | 21         | 21         |
| Test, Research, and University Reactors   |            |                |          |            |            |
| General Irradiation Test                  | 1          |                |          | 6          | 7          |
| High-Power Research and Test              | 4          |                |          | 8          | 12         |
| Safety-Research and Test                  |            |                |          | 10         | 10         |
| General Research                          | 14         |                |          | 57         | 71         |
| University Research and Teaching          | 34         |                |          | 31         | 65         |
| <b>PRODUCTION REACTORS</b>                |            |                |          |            |            |
| Materials Production                      | 1          |                |          | 12         | 13         |
| Process Development                       |            |                |          | 5          | 5          |
| <b>MILITARY REACTORS</b>                  |            |                |          |            |            |
| Defense Power-Reactor Applications        |            |                |          |            |            |
| Remote Installations                      |            |                |          | 6          | 6          |
| Propulsion (Naval)                        | 112        | 4              | 1        | 96         | 213        |
| Developmental Power                       |            |                |          |            |            |
| Electric-Power Experiments and Prototypes |            |                |          | 3          | 3          |
| Propulsion Experiments and Prototypes     | 2          |                |          | 13         | 15         |
| Test and Research                         |            |                |          |            |            |
| Test                                      |            |                |          | 3          | 3          |
| Research                                  | 4          |                |          | 6          | 10         |
| <b>EXPORT REACTORS</b>                    |            |                |          |            |            |
| <b>POWER REACTORS</b>                     |            |                |          |            |            |
| Central-Station Electric Power Plants     | 51         | 8              | 6        | 7          | 72         |
| Propulsion                                |            |                |          | 1          | 1          |
| <b>TEST, RESEARCH, AND TEACHING</b>       |            |                |          |            |            |
| General Irradiation Test                  | 7          |                |          |            | 7          |
| General Research                          | 27         | 1              | 1        | 10         | 39         |
| University Research and Teaching          | 19         |                |          | 6          | 25         |
| <b>Totals</b>                             | <b>385</b> | <b>18</b>      | <b>8</b> | <b>356</b> | <b>767</b> |

TABLE 3

## ABBREVIATIONS OF CONTRACTORS, DESIGNERS, SHIPBUILDERS, AND FACILITY OPERATORS

This list contains references to current and historical corporate and government structure.

|               |                                                                                                                                                                                                                                                                                       |              |                                                                                                                                                                                                                                                                    |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC            | Allis-Chalmers Mfg. Co.                                                                                                                                                                                                                                                               | Fluor        | The Fluor Corporation, Ltd.                                                                                                                                                                                                                                        |
| ACBC          | Ateliers de Construction Electrique de Charleroi S.A. (Belgium)                                                                                                                                                                                                                       | Fram.        | Framatome                                                                                                                                                                                                                                                          |
| ACF           | ACF Industries, Inc. (reactor activities abandoned by AC)                                                                                                                                                                                                                             | FW           | Foster Wheeler Corp.                                                                                                                                                                                                                                               |
| AEC           | Atomic Energy Commission, a predecessor of the Department of Energy                                                                                                                                                                                                                   | GA           | General Atomics Technologies                                                                                                                                                                                                                                       |
| AG            | Aerojet-General Corporation                                                                                                                                                                                                                                                           | GD (Quincy)  | Quincy Division, General Dynamics Corp.                                                                                                                                                                                                                            |
| AGN           | Aerojet-General Nucleonics, formerly a subsidiary and then a division of Aerojet-General Corporation                                                                                                                                                                                  | GB           | General Electric Company                                                                                                                                                                                                                                           |
| AI            | Atomics International, a division of Rockwell International                                                                                                                                                                                                                           | GNEC         | General Nuclear Engineering Corp. (became a division of Combustion Engineering, Inc., in 1964)                                                                                                                                                                     |
| Alco          | Alco Products, Inc. (reactor activities absorbed by AC)                                                                                                                                                                                                                               | IC           | Internuclear Co.                                                                                                                                                                                                                                                   |
| AMF           | AMF Atomics, Inc., a division of American Machine & Foundry Co.                                                                                                                                                                                                                       | INC          | Idaho Nuclear Corporation                                                                                                                                                                                                                                          |
| ANL           | Argonne National Laboratory                                                                                                                                                                                                                                                           | INEL         | Idaho National Engineering Laboratory                                                                                                                                                                                                                              |
| ANPD          | Aircraft Nuclear Propulsion Department, General Electric Company (name changed to Flight Propulsion Laboratory Department)                                                                                                                                                            | Ingalls      | Ingalls Shipbuilding Corp.                                                                                                                                                                                                                                         |
| AR            | American Radiator                                                                                                                                                                                                                                                                     | Kaman        | Kaman Nuclear, a division of Kaman Aircraft Corp.                                                                                                                                                                                                                  |
| AS Inc.       | American Standard Inc.                                                                                                                                                                                                                                                                | KAPL         | Knolls Atomic Power Laboratory                                                                                                                                                                                                                                     |
| AU            | Associated Universities, Inc. (Brookhaven National Laboratory)                                                                                                                                                                                                                        | KE           | Kaiser Engineers, a division of Henry J. Kaiser Co.                                                                                                                                                                                                                |
| BAC           | Bendix Aviation Corp.                                                                                                                                                                                                                                                                 | LANL         | Los Alamos National Laboratory                                                                                                                                                                                                                                     |
| Behlehem      | Shipbuilding Division, Bethlehem Steel Co. (now Quincy Division, General Dynamics Corp.)                                                                                                                                                                                              | LITCO        | Lockheed Idaho Technologies Company                                                                                                                                                                                                                                |
| Bettis        | Bettis Atomic Power Laboratory                                                                                                                                                                                                                                                        | LLNL         | Lawrence Livermore National Laboratory                                                                                                                                                                                                                             |
| Blaw-Knox     | Blaw-Knox Co.                                                                                                                                                                                                                                                                         | Lockheed     | Lockheed Aircraft Corp.                                                                                                                                                                                                                                            |
| B&R           | Burns & Roe, Inc.                                                                                                                                                                                                                                                                     | Mare Island  | Mare Island Naval Shipyard                                                                                                                                                                                                                                         |
| B&W           | Babcock & Wilcox Co.                                                                                                                                                                                                                                                                  | Martin       | Martin Marietta Corp.                                                                                                                                                                                                                                              |
| BNL           | Brookhaven National Laboratory                                                                                                                                                                                                                                                        | Maxon        | Maxon Construction Co.                                                                                                                                                                                                                                             |
| CL            | Clinch Laboratory of the Manhattan Engineer District                                                                                                                                                                                                                                  | Mel. Lab     | Metallurgical Laboratory of the Manhattan Engineer District                                                                                                                                                                                                        |
| Comb.         | Combustion Engineering, Inc.                                                                                                                                                                                                                                                          | NASA         | National Aeronautics and Space Administration                                                                                                                                                                                                                      |
| Convair       | Convair Division, General Dynamics Corp.                                                                                                                                                                                                                                              | NBS          | National Bureau of Standards                                                                                                                                                                                                                                       |
| Cook          | Nucleodyne Co., a division of Cook Electric Company                                                                                                                                                                                                                                   | Newport News | Newport News Shipbuilding & Dry Dock Co.                                                                                                                                                                                                                           |
| CW            | Curtiss-Wright Corporation                                                                                                                                                                                                                                                            | NRDS         | Nuclear Rocket Development Station                                                                                                                                                                                                                                 |
| Daystrom      | Daystrom, Inc.                                                                                                                                                                                                                                                                        | NRL          | Naval Research Laboratory                                                                                                                                                                                                                                          |
| DECON         | A method of decommissioning in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations. | NSA          | Nuclear Systems Associates                                                                                                                                                                                                                                         |
| DNA           | Defense Nuclear Agency, Department of Defense                                                                                                                                                                                                                                         | NTS          | Nevada Test Site                                                                                                                                                                                                                                                   |
| DOD           | Department of Defense                                                                                                                                                                                                                                                                 | NYSC         | New York Shipbuilding Corp.                                                                                                                                                                                                                                        |
| DOE           | Department of Energy                                                                                                                                                                                                                                                                  | ORNL         | Oak Ridge National Laboratory                                                                                                                                                                                                                                      |
| Du Pont       | E.I. Du Pont de Nemours & Company, Inc.                                                                                                                                                                                                                                               | PNL          | Pacific Northwest Laboratory                                                                                                                                                                                                                                       |
| EG&G-ID       | EG&G Idaho, Inc. (a division of EG&G, Inc.)                                                                                                                                                                                                                                           | Portsmouth   | Portsmouth Naval Shipyard                                                                                                                                                                                                                                          |
| Electric Boat | Electric Boat Division, General Dynamics Corp.                                                                                                                                                                                                                                        | PPC          | Phillips Petroleum Co.                                                                                                                                                                                                                                             |
|               |                                                                                                                                                                                                                                                                                       | PRDC         | Power Reactor Development Company                                                                                                                                                                                                                                  |
|               |                                                                                                                                                                                                                                                                                       | RI           | Rockwell International                                                                                                                                                                                                                                             |
|               |                                                                                                                                                                                                                                                                                       | SAFSTOR      | A method of decommissioning in which the nuclear facility is placed and maintained in such condition that the nuclear facility can be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use. |

7 1 81

Sandia  
UNC  
Vitro  
West.  
WHC

Sandia National Laboratories  
United Nuclear Corporation, Development Division  
Vitro Corporation of America  
Westinghouse Electric Corporation  
Westinghouse Hanford Co.

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

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# REACTORS AND FACILITIES OPERABLE, BEING BUILT, OR PLANNED

## 1. POWER REACTORS

### A. Central-Station Electric Power Plants

## PART I CIVILIAN REACTORS (DOMESTIC)

| Name (licensee)<br>[docket number]                                                    | Location           | Principal<br>nuclear<br>contractor | Type                 | Power<br>MD capacity<br>net MW(e) | Power<br>Licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Comment                                                                                                     |
|---------------------------------------------------------------------------------------|--------------------|------------------------------------|----------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>OPERABLE</b>                                                                       |                    |                                    |                      |                                   |                            |                                   |                                                                                                             |
| Alvin W. Vogtle Nuclear Plant, Unit 1<br>(Georgia Power Co.) [50-424]                 | Waynesboro, GA     | West.                              | Pressurized<br>water | 1158.0                            | 3565.0                     | 87 03                             |                                                                                                             |
| Alvin W. Vogtle Nuclear Plant, Unit 2<br>(Georgia Power Co.) [50-425]                 | Waynesboro, GA     | West.                              | Pressurized<br>water | 1157.0                            | 3565.0                     | 89 03                             |                                                                                                             |
| Arkansas Nuclear One, Unit 1 (Entergy<br>Operations Inc.) [50-313]                    | Russellville, AR   | B&W                                | Pressurized<br>water | 836.0                             | 2568.0                     | 74 08                             |                                                                                                             |
| Arkansas Nuclear One, Unit 2 (Entergy<br>Operations Inc.) [50-368]                    | Russellville, AR   | Comb.                              | Pressurized<br>water | 858.0                             | 2815.0                     | 78 12                             |                                                                                                             |
| Beaver Valley Power Station, Unit 1 (Duquesne<br>Light Co., Ohio Edison Co.) [50-334] | Shippingport, PA   | West.                              | Pressurized<br>water | 810.0                             | 2652.0                     | 76 05                             |                                                                                                             |
| Beaver Valley Power Station, Unit 2 (Duquesne<br>Light Co.) [50-412]                  | Shippingport, PA   | West.                              | Pressurized<br>water | 820.0                             | 2652.0                     | 87 08                             |                                                                                                             |
| Big Rock Point Nuclear Plant (Consumers<br>Power Co.) [50-155]                        | Big Rock Point, MI | GE                                 | Boiling water        | 67.0                              | 240.0                      | 62 09                             |                                                                                                             |
| Braidwood Station, Unit 1<br>(Commonwealth Edison Co.) [50-456]                       | Braidwood, IL      | West.                              | Pressurized<br>water | 1120.0                            | 3411.0                     | 87 05                             |                                                                                                             |
| Braidwood Station, Unit 2<br>(Commonwealth Edison Co.) [50-457]                       | Braidwood, IL      | West.                              | Pressurized<br>water | 1120.0                            | 3411.0                     | 88 03                             |                                                                                                             |
| Browns Ferry Nuclear Power Station, Unit 1<br>(Tennessee Valley Authority) [50-259]   | Decatur, AL        | GE                                 | Boiling water        | 0.0                               | 3293.0                     | 73 08                             | Maximum dependable capacity is zero. Administrative hold<br>to resolve various TVA and NRC concerns 6/1/85. |
| Browns Ferry Nuclear Power Station, Unit 2<br>(Tennessee Valley Authority) [50-260]   | Decatur, AL        | GE                                 | Boiling water        | 1065.0                            | 3293.0                     | 74 07                             | Restarted 5/23/91.                                                                                          |
| Browns Ferry Nuclear Power Station, Unit 3<br>(Tennessee Valley Authority) [50-296]   | Decatur, AL        | GE                                 | Boiling water        | 1065.0                            | 3293.0                     | 76 08                             | Restarted 11/19/95.                                                                                         |
| Brunswick Steam Electric Plant, Unit 1<br>(Carolina Power & Light Co.) [50-325]       | Southport, NC      | GE                                 | Boiling water        | 767.0                             | 2436.0                     | 76 10                             |                                                                                                             |
| Brunswick Steam Electric Plant, Unit 2<br>(Carolina Power & Light Co.) [50-324]       | Southport, NC      | GE                                 | Boiling water        | 754.0                             | 2436.0                     | 75 03                             |                                                                                                             |
| Byron Station, Unit 1 (Commonwealth<br>Edison Co.) [50-454]                           | Byron, IL          | West.                              | Pressurized<br>water | 1105.0                            | 3411.0                     | 85 02                             |                                                                                                             |
| Byron Station, Unit 2 (Commonwealth<br>Edison Co.) [50-455]                           | Byron, IL          | West.                              | Pressurized<br>water | 1105.0                            | 3411.0                     | 87 01                             |                                                                                                             |
| Callaway Plant, Unit 1 (Union Electric Co.)<br>[50-483]                               | Fulton, MO         | West.                              | Pressurized<br>water | 1120.0                            | 3565.0                     | 84 10                             |                                                                                                             |
| Calvert Cliffs Nuclear Power Plant, Unit 1<br>(Baltimore Gas & Electric Co.) [50-317] | Lusby, MD          | Comb.                              | Pressurized<br>water | 830.0                             | 2700.0                     | 74 10                             |                                                                                                             |
| Calvert Cliffs Nuclear Power Plant, Unit 2<br>(Baltimore Gas & Electric Co.) [50-318] | Lusby, MD          | Comb.                              | Pressurized<br>water | 830.0                             | 2700.0                     | 76 11                             |                                                                                                             |
| Catawba Nuclear Station, Unit 1<br>(Duke Power Co.) [50-413]                          | Lake Wylie, SC     | West.                              | Pressurized<br>water | 1129.0                            | 3411.0                     | 85 01                             |                                                                                                             |

# 1. POWER REACTORS

## A. Central-Station Electric Power Plants (Continued)

## PART I CIVILIAN REACTORS (DOMESTIC)

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



|                                                                                     |                 |       |                   |        |        |       |
|-------------------------------------------------------------------------------------|-----------------|-------|-------------------|--------|--------|-------|
| 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 |
| Kewaunee 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)<br>[docket number]                                                        | Location             | Principal<br>nuclear<br>contractor | Type              | Power<br>MD capacity<br>net MW(e) | Power<br>Licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Comment |
|-------------------------------------------------------------------------------------------|----------------------|------------------------------------|-------------------|-----------------------------------|----------------------------|-----------------------------------|---------|
| <b>OPERABLE (Continued)</b>                                                               |                      |                                    |                   |                                   |                            |                                   |         |
| 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 (Entergy Operations Inc.) [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                             |         |
| Sequoyah Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-327]                      | Daisy, TN            | West.                              | Pressurized water | 1122.0                            | 3411.0                     | 80 07                             |         |
| Sequoyah 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                             |         |

| Name (licensee)<br>[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                                                                                              |
|---------------------------------------------------------------------------------------|---------------------|------------------------------|-------------------|------------------------------------|---------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------|
| Surry Power Station, Unit 1 (Virginia Electric & Power Co.) [50-280]                  | Gravel Neck, VA     | West.                        | Pressurized water | 781.0                              | 2441.0                          | 72 07                                 | Received low power operating license on 11/9/95.<br>Received full power operating license on 2/7/96. |
| 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]    | Vernon, VT          | GE                           | Boiling water     | 504.0                              | 1593.0                          | 72 03                                 |                                                                                                      |
| Virgil C. Summer Nuclear Station, Unit 1 (South Carolina Electric & Gas Co.) [50-395] | Jenkinsville, SC    | West.                        | Pressurized water | 885.0                              | 2775.0                          | 82 10                                 |                                                                                                      |
| Washington Nuclear Project, Unit 2 (Washington Public Power Supply System) [50-397]   | Richland, WA        | GE                           | Boiling water     | 1086.0                             | 3323.0                          | 84 01                                 |                                                                                                      |
| Waterford Generating Station, Unit 3 (Entergy Operations Inc.) [50-382]               | Taft, LA            | Comb.                        | Pressurized water | 1075.0                             | 3390.0                          | 85 03                                 |                                                                                                      |
| Watts Bar Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-390]                 | Spring City, TN     | West.                        | Pressurized water | 1165.0                             | 3411.0                          | 95 11                                 |                                                                                                      |
| 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                                 |                                                                                                      |

#### 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. |
| 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

(No reactors currently in this category)

#### 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).<br>Location                | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(T) | Initial<br>criticality<br>(yr mo) | Desig. Type.<br>Principal<br>nucl. contr. | Comment    |
|------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------------------------|------------|
| OPERABLE<br>Advanced Test Reactor (DOE).<br>INEL, ID |                                |                            | 250,000.0                    |                                   |                            | 68 00                             | ATR. Tank.<br>LITCO                       | Operating. |

## B. High-Power Research and Test

| Name (Regulatory agency).<br>Location                                   | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(T) | Initial<br>criticality<br>(yr mo) | Desig. Type.<br>Principal<br>nucl. contr. | Comment                                        |
|-------------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------------------------|------------------------------------------------|
| <b>OPERABLE</b>                                                         |                                |                            |                              |                                   |                            |                                   |                                           |                                                |
| Brookhaven Medical Research<br>Reactor (DOE), Upton, NY                 |                                |                            | 3,000.0                      |                                   |                            | 59 00                             | BMRR. Tank.<br>Daystrom                   |                                                |
| High Flux Beam Reactor<br>(DOE), Upton, NY                              |                                |                            | 30,000.0                     |                                   |                            | 65 10                             | HFBR. Heavy<br>water. BNL                 | Power derated subject to further safety tests. |
| High Flux Isotope Reactor (DOE).<br>Oak Ridge, TN                       |                                |                            | 85,000.0                     |                                   |                            | 65 00                             | HFIR. Tank flux<br>trap. ORNL             | Operating.                                     |
| National Institute of Standards &<br>Technology (NRC), Gaithersburg, MD |                                |                            | 20,000.0                     |                                   |                            | 67 00                             | NIST. Heavy<br>water.<br>NBS-B&R          |                                                |

## C. Safety Research and Test

(No reactors currently in this category)

## D. General Research

|                                                                               |  |  |         |  |  |       |                                       |                                                                                                                                    |
|-------------------------------------------------------------------------------|--|--|---------|--|--|-------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>OPERABLE</b>                                                               |  |  |         |  |  |       |                                       |                                                                                                                                    |
| Advanced Reactivity Measurement<br>Facility (DOE), INEL Site, ID              |  |  | 100.0   |  |  | 60 00 | ARMF. Pool.<br>LITCO                  | Fast and thermal neutron irradiations and reactivity<br>measurements. Reactor currently shut down.                                 |
| Aerotest Operations, Inc. (NRC).<br>San Ramon, CA                             |  |  | 250.0   |  |  | 65 00 | AGNIR.<br>Pool-TRIGA<br>core. GA      |                                                                                                                                    |
| Coupled Fast Reactivity Measurement<br>Facility (DOE), INEL Site, ID          |  |  | 100.0   |  |  | 68 00 | CFRMF. Pool.<br>LITCO                 | Fast and thermal neutron irradiations, neutron<br>radiography, and thermal and fast fissile<br>assay. Reactor currently shut down. |
| Dow Chemical Co. (NRC), Midland, MI                                           |  |  | 300.0   |  |  | 67 00 | TRIGA-Mk I.<br>U-Zr hydride. GA       |                                                                                                                                    |
| General Atomics, Advanced TRIGA-Mk F<br>Prototype Reactor (NRC), La Jolla, CA |  |  | 1,500.0 |  |  | 60 00 | TRIGA-Mk F.<br>U-Zr hydride.<br>Owner | Possession only license, 3/22/95.                                                                                                  |
| General Atomics, TRIGA-Mk I<br>Prototype Reactor (NRC), La Jolla, CA          |  |  | 250.0   |  |  | 58 00 | TRIGA-Mk I.<br>U-ZR hydride.<br>Owner |                                                                                                                                    |
| General Electric Nuclear Test Reactor<br>(NRC), Pleasanton, CA                |  |  | 100.0   |  |  | 57 00 | NTR. LWR.<br>GB                       |                                                                                                                                    |
| Neutron Radiography Facility (DOE).<br>INEL, ID                               |  |  | 250.0   |  |  | 77 00 | NRAD.<br>Pool-TRIGA<br>core. ANL      |                                                                                                                                    |
| Omaha Veterans Administration<br>Hospital (NRC), Omaha, NE                    |  |  | 18.0    |  |  | 59 00 | TRIGA-Mk I.<br>U-Zr hydride.<br>GA    |                                                                                                                                    |
| Rhode Island Nuclear Science Center<br>(NRC), Narragansett, RI                |  |  | 2,000.0 |  |  | 64 00 | RINSC.<br>Pool. RI                    |                                                                                                                                    |

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### PART I CIVILIAN REACTORS (DOMESTIC)

#### D. General Research (Continued)

| Name (Regulatory agency).<br>Location                                                  | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(T) | Initial<br>criticality<br>(yr mo) | Desig. Type.<br>Principal<br>nucl. contr.              | Comment                                 |
|----------------------------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|--------------------------------------------------------|-----------------------------------------|
| Sandia Pulsed Reactor II (DOE).<br>Kirtland AFB, East, NM                              |                                |                            | 25.0                         |                                   |                            | 67 00                             | SPR-II. Bare<br>metal fast<br>burst. Sandia            | Pulse, steady state.                    |
| Sandia Pulsed Reactor III (DOE).<br>Kirtland AFB, East, NM                             |                                |                            | 25.0                         |                                   |                            | 75 00                             | SPR-III. Bare<br>metal fast<br>burst. Sandia           | Pulse, steady state.                    |
| SNL Annular Core Research Reactor (DOE).<br>Kirtland AFB, East, NM                     |                                |                            | 2,000.0                      |                                   |                            | 78 00                             | ACRR. Pool-UO <sub>2</sub><br>burst. Sandia            | Pulse, computer transient steady state. |
| U.S. Geological Survey Laboratory<br>(Department of the Interior) (NRC).<br>Denver, CO |                                |                            | 1,000.0                      |                                   |                            | 69 00                             | BeO core. Sandia<br>TRIGA-Mk I.<br>U-Zr hydride.<br>GA |                                         |

#### E. University Research and Teaching

|                                                            |  |  |         |  |  |       |                                       |                                                                                                                                                                                                                                 |
|------------------------------------------------------------|--|--|---------|--|--|-------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OPERABLE</b>                                            |  |  |         |  |  |       |                                       |                                                                                                                                                                                                                                 |
| Arizona, University of (NRC).<br>Tucson, AZ                |  |  | 100.0   |  |  | 58 00 | TRIGA-Mk I.<br>U-Zr hydride.<br>GA    |                                                                                                                                                                                                                                 |
| California, Irvine, University of (NRC).<br>Irvine, CA     |  |  | 250.0   |  |  | 69 00 | TRIGA-Mk I.<br>U-Zr hydride.<br>GA    |                                                                                                                                                                                                                                 |
| Cornell University (NRC). Ithaca, NY                       |  |  | 500.0   |  |  | 62 00 | TRIGA-Mk II.<br>U-Zr hydride.<br>GA   |                                                                                                                                                                                                                                 |
| Cornell University Zero Power Reactor<br>(NRC). Ithaca, NY |  |  |         |  |  | 62 00 | ZPR. Tank.<br>VitrO                   | Authorized power is negligible.                                                                                                                                                                                                 |
| Florida, University of (NRC).<br>Gainesville, FL           |  |  | 100.0   |  |  | 59 00 | UFTR.<br>Graphite/water.<br>GNEC      |                                                                                                                                                                                                                                 |
| Georgia Institute of Technology (NRC).<br>Atlanta, GA      |  |  | 5,000.0 |  |  | 64 00 | GTRR. Heavy<br>water. GNEC            |                                                                                                                                                                                                                                 |
| Idaho State University (NRC).<br>Pocatello, ID             |  |  |         |  |  | 67 00 | AGN-201P-103.<br>Homog. solid.<br>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<br>hydride. GA            |                                                                                                                                                                                                                                 |
| Illinois, University of (NRC).<br>Champaign-Urbana, IL     |  |  | 1,500.0 |  |  | 60 00 | TRIGA-Mk II.<br>U-Zr hydride.<br>GA   |                                                                                                                                                                                                                                 |
| Iowa State University (NRC). Ames, IA                      |  |  | 10.0    |  |  | 59 00 | UTR-10.<br>Graphite/water.<br>AS Inc. |                                                                                                                                                                                                                                 |

|                                                                                                                             |                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                 |                                                                                                               |                                                                     |                                                                         |                                                                         |                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------|
| <p>n College (NRC).<br/>         New York, NY<br/>         Maryland, University of (NRC).<br/>         College Park, MD</p> | <p>Massachusetts, University of (NRC).<br/>         Lowell, MA<br/>         Massachusetts Institute of Technology<br/>         (NRC). Cambridge, MA</p> | <p>Michigan, University of (Ford Nuclear<br/>         Reactor) (NRC). Ann Arbor, MI<br/>         Missouri at Rolla, University of<br/>         (NRC). Rolla, MO<br/>         Missouri, University of (NRC).<br/>         Columbia, MO<br/>         New Mexico, University of (NRC).<br/>         Albuquerque, NM</p> | <p>North Carolina State University<br/>         (NRC). Raleigh, NC<br/>         Ohio State University (NRC).<br/>         Columbus, OH<br/>         Oregon State University (NRC).<br/>         Corvallis, OR<br/>         Penn State TRIGA Reactor (NRC).<br/>         University Park, PA</p> | <p>Purdue University (NRC).<br/>         West Lafayette, IN<br/>         Reed College (NRC). Portland, OR</p> | <p>State University of New York<br/>         (NRC). Buffalo, NY</p> | <p>Texas A&amp;M University (NRC).<br/>         College Station, TX</p> | <p>Texas A&amp;M University (NRC).<br/>         College Station, TX</p> | <p>Texas at Austin, University of (NRC).<br/>         Austin, TX</p> |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------|

**Authorized power is negligible.**

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.

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.

**The State University of New York at Buffalo reactor ceased operation 6/94, and the licensee is planning to decommission. Authorized power is negligible.**

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.

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

#### PART I CIVILIAN REACTORS (DOMESTIC)

##### E. University Research and Teaching (Continued)

| Name (Regulatory agency).<br>Location                   | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(T) | Initial<br>criticality<br>(yr mo) | Desig. Type.<br>Principal<br>nucl. contr. | Comment                                                                                                                                                                                                                         |
|---------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Utah, University of (NRC). Salt Lake<br>City, UT        |                                |                            | 100.0                        |                                   |                            | 75 00                             | TRIGA-Mk I.<br>U-Zr hydride.<br>GA        |                                                                                                                                                                                                                                 |
| Virginia, University of (NRC).<br>Charlottesville, VA   |                                |                            | 2,000.0                      |                                   |                            | 60 00                             | UVAR. Pool.<br>Owner-B&W                  |                                                                                                                                                                                                                                 |
| Washington State University (NRC).<br>Pullman, WA       |                                |                            | 1,000.0                      |                                   |                            | 67 00                             | WSTR.<br>Pool-TRIGA<br>core. GA           | In 1967 the original MTR-type core of the<br>Washington State University reactor was replaced<br>by a modified TRIGA-type core and control<br>system, and the steady-state power level was<br>increased from 100 to 1000 kW(t). |
| Wisconsin, University of (NRC).<br>Madison, WI          |                                |                            | 1,000.0                      |                                   |                            | 67 00                             | TRIGA.<br>Pool-TRIGA<br>core. GA          | The University of Wisconsin reactor has been modified<br>for 1000-kW steady-state operation with a TRIGA-<br>type core. Power level was 250 kW prior to<br>modification in 1967.                                                |
| Worcester Polytechnic Institute (NRC).<br>Worcester, MA |                                |                            | 10.0                         |                                   |                            | 59 00                             | No Desg. Pool.<br>GE                      |                                                                                                                                                                                                                                 |

### 1. MATERIALS PRODUCTION

#### PART II PRODUCTION REACTORS

| Name (Owner)                | Location  | Nuclear<br>designer | Type        | Authorized<br>power | Startup | Comment       |
|-----------------------------|-----------|---------------------|-------------|---------------------|---------|---------------|
| OPERABLE<br>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                                                            |
|-------------------------------|-------------|------------------------|---------|--------------------------------------------------------------------|
| <b>OPERABLE</b>               |             |                        |         |                                                                    |
| DANIEL WEBSTER                | ex-SSBN626  | Electric Boat (Groton) | 64 00   | Removed from sea-going service and converted to training platform. |
| SAM RAYBURN                   | ex-SSBN635  | Newport News           | 64 00   | Removed from sea-going service and converted to training platform. |
| USS TAUTOG                    | SSN639      | Ingalls                | 68 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 SUNFISH                   | SSN649      | GD (Quincy)            | 68 00   |                                                                    |
| USS SAND LANCE                | SSN660      | Portsmouth             | 71 00   |                                                                    |
| USS HAWKBILL                  | SSN666      | Mare Island            | 70 00   |                                                                    |
| USS SPADEFISH                 | SSN668      | Newport News           | 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 TREPANG                   | SSN674      | Electric Boat (Groton) | 70 00   |                                                                    |
| USS BILLFISH                  | SSN676      | Electric Boat (Groton) | 70 00   |                                                                    |
| USS ARCHERFISH                | SSN678      | 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 GROTON                    | SSN694      | Electric Boat (Groton) | 77 00   |                                                                    |

# 1. DEFENSE POWER-REACTOR APPLICATIONS

## B. Propulsion (Naval) (Continued)

| Name (all owned by U.S. Navy) | Designation | Shipbuilder            | Startup |
|-------------------------------|-------------|------------------------|---------|
| USS BIRMINGHAM                | SSN695      | Newport News           | 78 00   |
| USS INDIANAPOLIS              | SSN697      | Electric Boat (Groton) | 79 00   |
| USS BREMERTON                 | SSN698      | Electric Boat (Groton) | 79 00   |
| USS JACKSONVILLE              | SSN699      | Electric Boat (Groton) | 80 00   |
| USS DALLAS                    | SSN700      | Electric Boat (Groton) | 81 00   |
| USS LA JOLLA                  | SSN701      | Electric Boat (Groton) | 81 00   |
| USS PHOENIX                   | SSN702      | Electric Boat (Groton) | 81 00   |
| USS BOSTON                    | SSN703      | Electric Boat (Groton) | 82 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                      | SSN726      | Electric Boat (Groton) | 80 00   |
| USS MICHIGAN                  | SSN727      | Electric Boat (Groton) | 82 00   |
| USS FLORIDA                   | SSN728      | Electric Boat (Groton) | 82 00   |
| USS GEORGIA                   | SSN729      | Electric Boat (Groton) | 83 00   |
| USS HENRY M. JACKSON          | SSN730      | Electric Boat (Groton) | 84 00   |
| USS ALABAMA                   | SSN731      | Electric Boat (Groton) | 84 00   |
| USS ALASKA                    | SSN732      | Electric Boat (Groton) | 85 00   |
| USS NEVADA                    | SSN733      | Electric Boat (Groton) | 86 00   |
| USS TENNESSEE                 | SSN734      | Electric Boat (Groton) | 87 00   |
| USS PENNSYLVANIA              | SSN735      | Electric Boat (Groton) | 88 00   |
| USS WEST VIRGINIA             | SSN736      | Electric Boat (Groton) | 90 00   |
| USS KENTUCKY                  | SSN737      | Electric Boat (Groton) | 90 00   |
| USS MARYLAND                  | SSN738      | Electric Boat (Groton) | 91 00   |
| USS NEBRASKA                  | SSN739      | Electric Boat (Groton) | 93 00   |

|                                       |         |                         |       |
|---------------------------------------|---------|-------------------------|-------|
| USS RHODE ISLAND                      | SSBN740 | Electric Boat (Grotton) | 94 00 |
| USS MAINE                             | SSBN741 | Electric Boat (Grotton) | 95 00 |
| USS WYOMING                           | SSBN742 | Electric Boat (Grotton) | 96 00 |
| USS NEWPORT NEWS                      | SSN750  | Newport News            | 88 00 |
| USS SAN JUAN                          | SSN751  | Electric Boat (Grotton) | 87 00 |
| USS PASADENA                          | SSN752  | Electric Boat (Grotton) | 88 00 |
| USS ALBANY                            | SSN753  | Newport News            | 89 00 |
| USS TOPEKA                            | SSN754  | Electric Boat (Grotton) | 89 00 |
| USS MIAMI                             | SSN755  | Electric Boat (Grotton) | 89 00 |
| USS SCRANTON                          | SSN756  | Newport News            | 90 00 |
| USS ALEXANDRIA                        | SSN757  | Electric Boat (Grotton) | 91 00 |
| USS ASHEVILLE                         | SSN758  | Newport News            | 91 00 |
| USS JEFFERSON CITY                    | SSN759  | Newport News            | 91 00 |
| USS ANNAPOLIS                         | SSN760  | Electric Boat (Grotton) | 91 00 |
| USS SPRINGFIELD                       | SSN761  | Electric Boat (Grotton) | 92 00 |
| USS COLUMBUS                          | SSN762  | Electric Boat (Grotton) | 93 00 |
| USS SANTA FE                          | SSN763  | Electric Boat (Grotton) | 93 00 |
| USS BOISE                             | SSN764  | Newport News            | 92 00 |
| USS MONTPELIER                        | SSN765  | Newport News            | 92 00 |
| USS CHARLOTTE                         | SSN766  | Newport News            | 94 00 |
| USS HAMPTON                           | SSN767  | Newport News            | 93 00 |
| USS HARTFORD                          | SSN768  | Electric Boat (Grotton) | 94 00 |
| USS TOLEDO                            | SSN769  | Newport News            | 94 00 |
| USS TUCSON                            | SSN770  | Newport News            | 94 00 |
| USS COLUMBIA                          | SSN771  | Electric Boat (Grotton) | 95 00 |
| USS GREENVILLE                        | SSN772  | Newport News            | 95 00 |
| USS CHEYENNE                          | SSN773  | Newport News            | 95 00 |
| USS SEAWOLF                           | SSN21   | Electric Boat (Grotton) | 95 00 |
| USS CALIFORNIA (2 reactors)           | CGN36   | Newport News            | 73 00 |
| USS SOUTH CAROLINA (2 reactors)       | CGN37   | Newport News            | 74 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 |
| USS JOHN C. STENNIS (2 reactors)      | CVN74   | Newport News            | 95 00 |
| Deep Submergence Research Vehicle     | NR-1    | Electric Boat (Grotton) | 69 00 |

## 1. DEFENSE POWER-REACTOR APPLICATIONS

## PART III MILITARY REACTORS

### B. Propulsion (Naval) (Continued)

| Name (all owned by U.S. Navy) | Designation | Shipbuilder            | Startup |
|-------------------------------|-------------|------------------------|---------|
| BEING BUILT                   |             |                        |         |
| LOUISIANA                     | SSBN743     | Electric Boat (Groton) |         |
| CONNECTICUT                   | SSN22       | Electric Boat (Groton) |         |
| HARRY S. TRUMAN               | CVN75       | Newport News           |         |
| RONALD REAGAN                 | CVN76       | Newport News           |         |
| Name (all owned by U.S. Navy) | Designation | Shipbuilder            | Startup |
| PLANNED<br>(UNNAMED)          | SSN23       | Electric Boat (Groton) |         |

## 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                                                               |             |                          |                        |                             |                                            |                                                    |
| Modifications and Additions to Reactor Facility (DOE), West Milton, NY | MARF        |                          |                        | 76 00                       |                                            | Pressurized water. Lockheed Martin. (Formerly GE). |
| Trident Prototype, (DOE) West Milton, NY                               | S8G         |                          |                        | 78 00                       |                                            | Pressurized water. Lockheed Martin. (Formerly GE). |

## 3. TEST AND RESEARCH

### A. Test

(No reactors currently in this category)

## 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 |
|-----------------------------------------------------------------------------------------|-------------|--------------------------|------------------------|-----------------------------|--------------------------------------------|---------|
| <b>OPERABLE</b>                                                                         |             |                          |                        |                             |                                            |         |
| Armed Forces Radiobiology Research Institute, DNA (DOD), Regulated by NRC, Bethesda, MD | AFRR        |                          | 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            |         |
| McClellan Nuclear Radiation Center (USAF), McClellan AFB, CA                            | MNRC        |                          | 1,300.0                | 91 01                       | TRIGA Mod Mark II, GA                      |         |

## 1. POWER REACTORS

### PART IV EXPORT REACTORS

## A. Central-Station Electric Power Plants

15

| Reactor Name (Owner), Location                                                                | NRC export license No. and date | Principal nuclear reactor type | Power design net MW(e) | Power MW(t) | Authorized power kW(t) | Initial criticality (yr mo) | Comment                                             |
|-----------------------------------------------------------------------------------------------|---------------------------------|--------------------------------|------------------------|-------------|------------------------|-----------------------------|-----------------------------------------------------|
| <b>OPERABLE</b>                                                                               |                                 |                                |                        |             |                        |                             |                                                     |
| 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, Pressurized water        | 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 Eletrica de Furnas, Angra dos Reis                                   | XR-081 04/13/73                 | West, Pressurized water        | 626.0                  | 1,882.0     |                        | 85 00                       |                                                     |
| England, Sizewell B (Nuclear Electric), Suffolk                                               | XR-148 07/30/86                 | West, Pressurized water        | 1,188.0                | 3,425.0     |                        | 94 00                       | Former owner: Central Electricity Generating Board. |
| Germany, Muelheim-Kaerlich (Rheinsch-Westfaelisches Elektrizitaetswerk AG), Muelheim-Kaerlich | 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                       |                                                     |

# 1. POWER REACTORS

## PART IV EXPORT REACTORS

### A. Central-Station Electric Power Plants (Continued)

| Reactor Name (Owner). Location                                                                            | NRC<br>export<br>license<br>No. and<br>date | Principal<br>nuclear<br>contractor.<br>Reactor type | Power<br>design<br>net MW(e) | Power<br>MW(t) | Author-<br>ized<br>power<br>kW(t) | Initial<br>criti-<br>cality<br>(yr mo) | Comment                        |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------|------------------------------|----------------|-----------------------------------|----------------------------------------|--------------------------------|
| India, Tarapur Nuclear Power<br>Station, Unit 2. Tarapur (near<br>Bombay)                                 | XR-054<br>07/07/64                          | GE.<br>Boiling water                                | 200.0                        | 707.0          |                                   | 69 00                                  |                                |
| Japan, Fukushima Dai-ichi Power<br>Station, Unit 1 (Tokyo Electric<br>Power Co.). Okuma, Fukushima Pref.  | XR-066<br>08/15/67                          | GE.<br>Boiling water                                | 439.0                        | 1,380.0        |                                   | 70 10                                  |                                |
| Japan, Fukushima Dai-ichi Power<br>Station, Unit 2 (Tokyo Electric<br>Power Co.). Okuma, Fukushima Pref.  | XR-072<br>04/22/70                          | GE, Toshiba.<br>Boiling water                       | 760.0                        | 2,381.0        |                                   | 73 05                                  |                                |
| Japan, Fukushima Dai-ichi Power<br>Station, Unit 6 (Tokyo Electric<br>Power Co.). Futaba, Fukushima Pref. | XR-084<br>05/25/73                          | GE, Toshiba.<br>Boiling water                       | 1,067.0                      | 3,293.0        |                                   | 79 03                                  |                                |
| Japan, Mihama Power Station, Unit 1.<br>(Kansai Electric Power Co.). Mihama, Fukui Pref.                  | XR-067<br>08/15/67                          | West., Mitsubishi.<br>Pressurized water             | 320.0                        | 1,031.0        |                                   | 70 07                                  |                                |
| Japan, Ohi Power Station, Unit 1<br>(Kansai Electric Power Co.). Ohi,<br>Fukui Pref.                      | XR-082<br>04/17/73                          | West., Mitsubishi.<br>Pressurized water             | 1,120.0                      | 3,423.0        |                                   | 77 12                                  |                                |
| Japan, Ohi Power Station, Unit 2<br>(Kansai Electric Power Co.). Ohi,<br>Fukui Pref.                      | XR-082<br>04/17/73                          | West., Mitsubishi.<br>Pressurized water             | 1,120.0                      | 3,423.0        |                                   | 78 09                                  |                                |
| Japan, Takahama Power Station,<br>Unit 1 (Kansai Electric Power Co.).<br>Takahama, Fukui Pref.            | XR-079<br>07/23/71                          | West., Mitsubishi.<br>Pressurized water             | 780.0                        | 2,440.0        |                                   | 74 03                                  |                                |
| Japan, Tokai No. 2 Power Station<br>(Japan Atomic Power Co.).<br>Tokai-Mura, Ibaraki Pref.                | XR-085<br>05/25/73                          | GE, Hitachi, Shimizu.<br>Boiling water              | 1,080.0                      | 3,293.0        |                                   | 78 01                                  |                                |
| Japan, Tsuruga Power Station,<br>Unit 1 (Japan Atomic Power Co.).<br>Tsuruga, Fukui Pref.                 | XR-065<br>06/22/67                          | GE.<br>Boiling water                                | 341.0                        | 1,064.0        |                                   | 69 10                                  |                                |
| Korea, Kori-1 (Korea Electric<br>Power Co.). Kori (near Pusan)                                            | XR-083<br>05/04/73                          | West.<br>Pressurized water                          | 564.0                        | 1,729.0        |                                   | 78 00                                  | Formerly, Korea, Unit 1.       |
| Korea, Kori-2 (Korea Electric<br>Power Co.). Kori (near Pusan)                                            | XR-119<br>04/08/77                          | West.<br>Pressurized water                          | 605.0                        | 1,876.0        |                                   | 83 00                                  | Formerly, Korea, Unit 2.       |
| Korea, Kori-3 (Korea Electric<br>Power Co.). Kori (near Pusan)                                            | XR-131<br>10/04/78                          | West.<br>Pressurized water                          | 900.0                        | 2,775.0        |                                   | 85 00                                  | Formerly, Korea, Unit 5.       |
| Korea, Kori-4 (Korea Electric<br>Power Co.). Kori (near Pusan)                                            | XR-131<br>10/04/78                          | West.<br>Pressurized water                          | 900.0                        | 2,775.0        |                                   | 85 00                                  | Formerly, Korea, Unit 6.       |
| Korea, Yonggwang-1 (Korea<br>Electric Power Co.). Gyema<br>(near Kwang Ju)                                | XR-133<br>09/22/80                          | West.<br>Pressurized water                          | 900.0                        | 2,775.0        |                                   | 86 00                                  | Formerly, Korea, Unit 7.       |
| Korea, Yonggwang-2 (Korea<br>Electric Power Co.). Gyema<br>(near Kwang Ju)                                | XR-133<br>09/22/80                          | West.<br>Pressurized water                          | 900.0                        | 2,777.0        |                                   | 87 00                                  | Formerly, Korea, Unit 8.       |
| Mexico, Laguna Verde Station,<br>Unit 1. Laguna Verde                                                     | XR-098<br>05/17/74                          | GE.<br>Boiling water                                | 654.0                        | 1,931.0        |                                   | 88 11                                  | Commercial operation, 7/29/90. |

Began commercial operation 4/95.

|                                                                                                           |                    |                            |        |         |       |
|-----------------------------------------------------------------------------------------------------------|--------------------|----------------------------|--------|---------|-------|
| Mexico, Laguna Verde Station,<br>Unit 2, Laguna Verde                                                     | XR-102<br>10/24/74 | GE.<br>Boiling water       | 654.0  | 1,931.0 | 94 09 |
| Netherlands, Dodewaard (GKN).                                                                             | XR-058<br>09/15/65 | GE.<br>Boiling water       | 55.0   | 183.0   | 68 06 |
| Dodewaard, Beuwe                                                                                          | XR-107<br>05/20/77 | West.<br>Pressurized water | 615.0  | 1,882.0 | 83 00 |
| Slovenia, Krsko (Nuklearna<br>Elektrarna Krsko), Krsko                                                    | XR-088<br>07/12/73 | West.<br>Pressurized water | 902.0  | 2,696.0 | 81 00 |
| Spain, Almaraz, Unit 1 (Union<br>Eléctrica, S.A.), Almaraz                                                | XR-088<br>07/12/73 | West.<br>Pressurized water | 902.0  | 2,696.0 | 83 00 |
| Spain, Almaraz, Unit 2 (Union<br>Eléctrica, S.A.), Almaraz                                                | XR-090<br>07/12/73 | West.<br>Pressurized water | 902.0  | 2,696.0 | 83 00 |
| Spain, Asco, Unit 1 (FECSA), Asco                                                                         | XR-099<br>06/22/76 | West.<br>Pressurized water | 902.0  | 2,696.0 | 85 00 |
| Spain, Asco, Unit 2 (FECSA), Asco                                                                         | XR-097<br>06/10/74 | GE.<br>Boiling water       | 975.0  | 2,900.0 | 84 00 |
| Spain, Cofrentes, Unit 1<br>(Hidroeléctrica Española S.A.),<br>Cofrentes                                  | XR-059<br>10/22/65 | West.<br>Pressurized water | 160.0  | 510.0   | 69 00 |
| Spain, José Cabrera (Union<br>Eléctrica, S.A.), Zorita de los<br>Canes                                    | XR-064<br>06/09/67 | GE.<br>Boiling water       | 440.0  | 1,381.0 | 70 00 |
| Spain, Santa Maria de Garofia<br>(Centrales Nucleares del Norte,<br>S.A., Nucleonor), S.M. Garofia Burgos | XR-122<br>09/13/87 | West.<br>Pressurized water | 920.0  | 2,785.0 | 88 03 |
| Spain, Vandellós, Unit 2 (ENHRR),<br>Tarragona                                                            | XR-069<br>05/09/69 | West.<br>Pressurized water | 875.0  | 2,660.0 | 74 10 |
| Sweden, Ringhals, Unit 2<br>(Vattenfall AB), Våro (near<br>Göteborg)                                      | XR-095<br>02/02/74 | West.<br>Pressurized water | 915.0  | 2,783.0 | 81 00 |
| Sweden, Ringhals, Unit 3<br>(Vattenfall AB), Våro (near<br>Göteborg)                                      | XR-103<br>10/21/75 | West.<br>Pressurized water | 915.0  | 2,783.0 | 83 00 |
| Switzerland, Beznau, Unit 1<br>(Nordostschweizerische Kraftwerke<br>AG), Döttingen                        | XR-063<br>02/03/67 | West.<br>Pressurized water | 350.0  | 1,130.0 | 69 00 |
| Switzerland, Beznau, Unit 2<br>(Nordostschweizerische Kraftwerke<br>AG), Döttingen                        | XR-070<br>11/05/69 | West.<br>Pressurized water | 350.0  | 1,130.0 | 71 00 |
| Switzerland, Leibstadt<br>(Kernkraftwerk Leibstadt),<br>Leibstadt                                         | XR-104<br>12/31/75 | GE.<br>Boiling water       | 1085.0 | 3,138.0 | 84 00 |
| Switzerland, Mühleberg (Bernische<br>Kraftwerke AG), Mühleberg<br>(near Bern)                             | XR-068<br>10/04/67 | GE.<br>Boiling water       | 320.0  | 997.0   | 72 00 |
| Taiwan, Chinshan, Unit 1 (Taiwan<br>Power Co.), Shihmen                                                   | XR-080<br>07/24/72 | GE.<br>Boiling water       | 604.0  | 1,775.0 | 77 10 |
| Taiwan, Chinshan, Unit 2 (Taiwan<br>Power Co.), Shihmen                                                   | XR-080<br>07/24/72 | GE.<br>Boiling water       | 604.0  | 1,775.0 | 78 11 |
| Taiwan, Kuo Sheng, Unit 1 (Taiwan<br>Power Co.), Wanli Hsiang                                             | XR-096<br>04/17/74 | GE.<br>Boiling water       | 948.0  | 2,894.0 | 81 02 |
| Taiwan, Kuo Sheng, Unit 2 (Taiwan<br>Power Co.), Wanli Hsiang                                             | XR-096<br>04/17/74 | GE.<br>Boiling water       | 948.0  | 2,894.0 | 82 03 |
| Taiwan, Maanshan, Unit 1 (Taiwan<br>Power Co.), Heng-chun                                                 | XR-113<br>06/08/79 | West.<br>Pressurized water | 890.0  | 2,785.0 | 84 03 |
| Taiwan, Maanshan, Unit 2 (Taiwan<br>Power Co.), Heng-chun                                                 | XR-113<br>06/08/79 | West.<br>Pressurized water | 890.0  | 2,785.0 | 85 02 |

# 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                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------|------------------------|-------------|------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BEING BUILT</b>                                                                                                      |                                 |                                              |                        |             |                        |                             |                                                                                                                                                                  |
| Japan, Kashiwazaki-Kariwa, Unit 6 (Tokyo Electric Power Co.), Kashiwazaki, Niigata Pref.                                |                                 | GE, Toshiba, Hitachi. Advanced boiling water | 1,311.0                | 3,930.0     |                        |                             | As of 12/95, 94.9% completed. Commercial operation is scheduled for 12/96.                                                                                       |
| Japan, Kashiwazaki-Kariwa, Unit 7 (Tokyo Electric Power Co.), Kashiwazaki, Niigata Pref.                                |                                 | GE, Hitachi, Toshiba. Advanced boiling water | 1,311.0                | 3,930.0     |                        |                             | As of 12/95, 80.9% completed. Commercial operation is scheduled for 7/97.                                                                                        |
| Korea, Yonggwang-3 (Korea Electric Power Co.), Gyema (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.), Gyema (near Kwang Ju)                                                    | XR-150 04/16/87                 | Comb. Pressurized water                      | 900.0                  |             |                        | 96 00                       | Also, Korea, Unit 12.                                                                                                                                            |
| Philippines, Republic of the Philippine Nuclear Power Plant, Unit 1 (National Power Corp.), Morong, Bataan Prov., Luzon | XR-120 05/06/80                 | West. Pressurized water                      | 620.0                  | 1,876.0     |                        | Indef.                      |                                                                                                                                                                  |
| Spain, Lemontiz, Unit 1.                                                                                                | XR-089 07/12/73                 | West. Pressurized water                      | 900.0                  | 2,696.0     |                        | Indef.                      |                                                                                                                                                                  |
| Spain, Lemontiz, Unit 2.                                                                                                | XR-089 07/12/73                 | West. Pressurized water                      | 900.0                  | 2,696.0     |                        | Indef.                      |                                                                                                                                                                  |
| Spain, Valdecaballeros, Unit 1 (HB: Sevillana de Electricidad), Valdecaballeros, Badajoz                                | XR-110 05/05/77                 | GE. Boiling water                            | 975.0                  | 2,894.0     |                        | Indef.                      |                                                                                                                                                                  |
| Spain, Valdecaballeros, Unit 2 (HB: Sevillana de Electricidad), Valdecaballeros, Badajoz                                | XR-110 05/05/77                 | GE. Boiling water                            | 975.0                  | 2,894.0     |                        | Indef.                      |                                                                                                                                                                  |
| <b>PLANNED</b>                                                                                                          |                                 |                                              |                        |             |                        |                             |                                                                                                                                                                  |
| Korea, Ulsin 3 (Korea Electric Power Co.), Kuongsangbuk-do                                                              | XR-153 04/06/92                 | Comb. Pressurized water                      | 950.0                  | 2825.0      |                        |                             |                                                                                                                                                                  |
| Korea, Ulsin 4 (Korea Electric Power Co.), Kuongsangbuk-do                                                              | XR-153 04/06/92                 | Comb. Pressurized water                      | 950.0                  | 2825.0      |                        |                             |                                                                                                                                                                  |
| Korea, Yonggwang-5 (Korea Electric Power Co.), Chollanam Province                                                       | XR-162                          | Comb., Hanjung Pressurized water             | 1,000.0                |             |                        |                             | License pending.                                                                                                                                                 |
| Korea, Yonggwang-6 (Korea Electric Power Co.), Chollanam Province                                                       | XR-162                          | Comb., Hanjung Pressurized water             | 1,000.0                |             |                        |                             | License pending.                                                                                                                                                 |
| 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. |



## B. Propulsion

(No reactors currently in this category)

## 2. TEST, RESEARCH, AND TEACHING

### A. General Irradiation Test

| Reactor Name (Owner). Location                                                   | NRC<br>export<br>license<br>No. and<br>date | Principal<br>nuclear<br>contractor.<br>Reactor type | Power<br>design<br>net MW(e) | Power<br>MW(t) | Author-<br>ized<br>power<br>kW(t) | Initial<br>crite-<br>rality<br>(yr mo) | Comment                                                                                                                                      |
|----------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------|------------------------------|----------------|-----------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OPERABLE</b>                                                                  |                                             |                                                     |                              |                |                                   |                                        |                                                                                                                                              |
| Japan, JRR-2 (Japan Atomic Energy Research Institute). Tokai-Mura, Ibaraki Pref. | XR-015<br>10/11/57                          | AMF.<br>Heavy water, CP-5                           |                              |                | 10,000.0                          | 60 10                                  |                                                                                                                                              |
| Japan, NSRR (Japan Atomic Energy Research Institute). Tokai-Mura, Ibaraki Pref.  | XR-101<br>10/16/74                          | GA.<br>TRIGA-ACPR                                   |                              |                | 300.0                             | 75 06                                  |                                                                                                                                              |
| Netherlands (Energy Center). Petten                                              | XR-017<br>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 Schelde of Flushing (Vlissingen, Holland). |
| Romania (Institute for Nuclear Research). Bucharest                              | XR-091<br>06/29/73                          | GA<br>TRIGA-ACPR                                    |                              |                | 500.0                             | 79 00                                  |                                                                                                                                              |
| Romania (Institute for Nuclear Research). Bucharest                              | XR-091<br>06/29/73                          | GA.<br>TRIGA (MPR 16)                               |                              |                | 14,000.0                          | 79 00                                  |                                                                                                                                              |
| South Africa, Safari-1 (Atomic Energy Board). Pelindaba (near Pretoria)          | XR-042<br>06/14/61                          | AC. Tank                                            |                              |                | 20,000.0                          | 65 00                                  |                                                                                                                                              |
| Sweden (Studsvik AB). Studsvik                                                   | XR-019<br>05/14/58                          | AC. Tank (MTR)                                      |                              |                | 50,000.0                          | 60 00                                  |                                                                                                                                              |

### B. General Research

|                                                                             |                    |                    |  |  |         |       |  |
|-----------------------------------------------------------------------------|--------------------|--------------------|--|--|---------|-------|--|
| <b>OPERABLE</b>                                                             |                    |                    |  |  |         |       |  |
| Australia, Moata (Atomic Energy Commission). Lucas Heights, New South Wales | XR-039<br>09/12/60 | AR. UTR-10         |  |  | 15.0    | 61 00 |  |
| Austria, Astra (Seibersdorf Research Center). Seibersdorf                   | XR-023<br>09/03/58 | AMF. Pool          |  |  | 5,000.0 | 60 00 |  |
| Bangladesh (Institute of Nuclear Technology). Dhaka                         | XR-126<br>10/05/82 | GA.<br>TRIGA-Mk II |  |  | 3,000.0 | 86 00 |  |
| Colombia, JAN-R1 (Institute of Nuclear Affairs). Bogotá                     | XR-053<br>05/27/64 | Lockheed. Pool     |  |  | 20.0    | 65 00 |  |
| Denmark, DR-1 (Risø National Laboratory). Risø                              | XR-005<br>04/04/57 | AI. L-55           |  |  | 2.0     | 57 00 |  |
| England (Imperial Chemical Industries). Billingham, Teesside                | XR-074<br>03/23/71 | GA. TRIGA-Mk I     |  |  | 250.0   | 71 00 |  |

## 2. TEST, RESEARCH, AND TEACHING

### B. General Research (Continued)

## PART IV EXPORT REACTORS

| Reactor Name (Owner), Location                                                           | NRC export license No. and date | Principal nuclear reactor type | Power design net MW(e) | Power MW(t) | Authorized power kW(t) | Initial criticality (yr mo) | Comment                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------|---------------------------------|--------------------------------|------------------------|-------------|------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OPERABLE (Continued)</b>                                                              |                                 |                                |                        |             |                        |                             |                                                                                                                                                                                                                                                                                                                                                          |
| 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                       | 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 (XR-078, 5/20/71).                                                                                                                                                                                     |
| Indonesia (National Atomic Energy Agency), Yogyakarta                                    |                                 | GA. TRIGA-Mk II                |                        |             | 250.0                  | 79 00                       | This reactor was designed and built by BATAN (National Atomic Energy Agency of Indonesia). The design was based on the design of TRIGA Mark II reactor, with maximum power level of 250 kW. In 1979 this reactor reached initial criticality at 50 kW. After the upgrading and replacing of some components, it reached a power level of 100 kW in 1984. |
| 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), Sacavén   | 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                |                        |             | 250.0                  | 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<br>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(0). 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(0)/2000 MW pulsing was commissioned 11/77. |
| Turkey (Atomic Energy Commission), Istanbul                  | XR-030<br>09/04/59 | AMF. Pool        | 1,000.0 | 62 00 |                                                                                                                                                                                                                                                                                                                                |
| Turkey (Technical University of Istanbul), Istanbul          | XR-108<br>03/24/76 | GA. TRIGA-Mk II  | 250.0   | 79 00 |                                                                                                                                                                                                                                                                                                                                |
| Venezuela (Institute for Scientific Research), Caracas       | XR-018<br>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., Maâmora), Rabat                             | XR-158<br>10/25/91 | GA. TRIGA-Mk II  | 2,000.0 |       | Originally planned as TRIGA-Mk I, reactor was upgraded to TRIGA-Mk II. Original export license was not used.                                                                                                                                                                                                                   |
| PLANNED                                                      |                    |                  |         |       |                                                                                                                                                                                                                                                                                                                                |
| Albania, Tirana                                              | XR-154<br>Pending  | GA. TRIGA-Mk I   | 250.0   |       | Export license application dated 10/9/90.                                                                                                                                                                                                                                                                                      |

### C. University Research and Teaching

|                                                                  |                    |                 |         |       |                                                                                                                                                                                                                                             |
|------------------------------------------------------------------|--------------------|-----------------|---------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Austria (Vienna Polytechnic Institute), Vienna                   | XR-035<br>11/24/59 | GA. TRIGA-Mk II | 250.0   | 62 00 |                                                                                                                                                                                                                                             |
| Brazil (University of Minas Gerais), Belo Horizonte              | XR-028<br>09/03/59 | GA. TRIGA-Mk I  | 100.0   | 60 00 |                                                                                                                                                                                                                                             |
| Brazil (University of São Paulo), São Paulo                      | XR-002<br>01/22/57 | B&W. Pool       | 5,000.0 | 57 00 |                                                                                                                                                                                                                                             |
| Canada (McMaster University), Hamilton, Ontario                  | XR-011<br>08/27/57 | AMF. Pool       | 5,000.0 | 59 00 |                                                                                                                                                                                                                                             |
| China, Republic of (National Tsing-Hua University), Hsinchu      | XR-020<br>06/05/58 | GE. Pool        | 1,000.0 | 62 00 |                                                                                                                                                                                                                                             |
| Finland (Institute of Technology), Helsinki                      | XR-040<br>04/05/61 | GA. TRIGA-Mk II | 250.0   | 62 00 |                                                                                                                                                                                                                                             |
| Germany (Institute for Nuclear Medicine), Heidelberg             | XR-060<br>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<br>04/11/64 | GA. TRIGA-Mk II | 100.0   | 65 00 |                                                                                                                                                                                                                                             |
| Germany (Medical College of Hanover), Hanover                    | XR-076<br>02/26/71 | GA. TRIGA-Mk I  | 250.0   | 73 00 |                                                                                                                                                                                                                                             |
| Germany, FRG (Garching (Technical University of Munich)), Munich | XR-004<br>03/15/57 | AMF. Pool       | 4,000.0 | 57 00 |                                                                                                                                                                                                                                             |
| Iran (University of Tehran), Tehran                              | XR-029<br>08/05/59 | AMF. Pool       | 5,000.0 | 67 00 | Fuel supplier being sought.                                                                                                                                                                                                                 |

## 2. TEST, RESEARCH, AND TEACHING

## PART IV EXPORT REACTORS

### C. University Research and Teaching (Continued)

| Reactor Name (Owner), Location                  | NRC export license No. and date | Principal nuclear contractor, Reactor type | Power design net MW(e) | Power MW(t) | Author-ized power kW(t) | Initial criti-cality (yr mo) | Comment                                                                                                                                                                                                 |
|-------------------------------------------------|---------------------------------|--------------------------------------------|------------------------|-------------|-------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 (Musashi College of Technology), Kawasaki | XR-037 07/08/60                 | GA. TRIGA-Mk II                            |                        | 100.0       |                         | 63 01                        |                                                                                                                                                                                                         |
| Japan (Rikkyo University), Yokosuka             | 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                                   |                        |             | 2,000.0                 | 82 00                        | Negligible power.                                                                                                                                                                                       |
| Netherlands (Delft Technical University), Delft | XR-003 02/01/57                 | AMF. Pool (MTR)                            |                        |             |                         | 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    |                            | Abbreviation   | Initial criticality (yr mo) | Comment                                                 |
|-----------------------------------------------|-------------|-------------------------------|--------------|----------------------------|----------------|-----------------------------|---------------------------------------------------------|
|                                               |             |                               | No. of cells | No. of control panels/room |                |                             |                                                         |
| Advanced Test Reactor Critical Facility (DOE) | ATRC        | INEL Site, ID                 | 1            | 1                          | ATRC           | 64 00                       | ATR physics, core-loading and core-design measurements. |
| Los Alamos National Laboratory (DOE)          | Big Ten     | Pajarito Site, Los Alamos, NM |              |                            | LANL, Kiva II  | 72 00                       | U(10)-metal cylinder in thick metal reflector.          |
| Los Alamos National Laboratory (DOE)          | Comet       | Pajarito Site, Los Alamos, NM |              |                            | LANL, Kiva II  | 52 00                       | Critical-configuration safety and neutronic tests.      |
| Los Alamos National Laboratory (DOE)          | Flattop     | Pajarito Site, Los Alamos, NM | 1            | 1                          | LANL, Kiva II  | 57 00                       | Spherical metal cores in thick metal reflector.         |
| Los Alamos National Laboratory (DOE)          | Godiva-IV   | Pajarito Site, Los Alamos, NM |              |                            | LANL, Kiva III | 67 00                       | Fast neutron irradiation, pulse capability.             |
| Los Alamos National Laboratory (DOE)          | Honeycomb   | Pajarito Site, Los Alamos, NM |              |                            | LANL, Kiva I   | 56 00                       | Flexible split table assembly.                          |
| Los Alamos National Laboratory (DOE)          | Mars        | Pajarito Site, Los Alamos, NM |              |                            | LANL, Kiva I   | 74 00                       | Vertical table assembly machine.                        |
| Los Alamos National Laboratory (DOE)          | Planet      | Pajarito Site, Los Alamos, NM | 2            | 1                          | LANL, Kiva II  | 84 00                       | Vertical table assembly.                                |
| Los Alamos National Laboratory (DOE)          | SHEBA       | Pajarito Site, Los Alamos, NM | 1            | 1                          | LANL, Kiva I   | 80 00                       | Solution high energy burst assembly.                    |
| Los Alamos National Laboratory (DOE)          | SKUA        | Pajarito Site, Los Alamos, NM | 1            | 1                          | LANL, Kiva III | 78 00                       | Fast neutron irradiation, pulse capability.             |
| Rensselaer Polytechnic Institute (NRC)        | CX          | Troy, NY                      | 1            | 1                          | Rensselaer     | 66 00                       | Critical experiment assembly.                           |
| SNL Critical Assembly (DOE)                   |             | Kirtland AFB East, NM         |              |                            | Sandia         | 89 09                       | Space power neutronics; in shutdown.                    |

## 2. MILITARY

## PART V CRITICAL ASSEMBLIES

| Facility (Regulatory agency)                        | Designation                                 | Location   | Equipment       |                                      |              | Comment                              |
|-----------------------------------------------------|---------------------------------------------|------------|-----------------|--------------------------------------|--------------|--------------------------------------|
|                                                     |                                             |            | No. of<br>cells | No. of<br>control<br>panels/<br>room | Abbreviation |                                      |
| Nuclear Safety Facility, Rocky Flats Plant<br>(DOE) | Horizontal/<br>Split Table<br>Solution Base | Golden, CO | 1               | 1                                    | RFP-NSF      | Critical-configuration safety tests. |
| Nuclear Safety Facility, Rocky Flats Plant<br>(DOE) |                                             | Golden, CO |                 |                                      | RFP-NSF      | Critical-configuration safety tests. |

**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)<br>[docket number]                                                                                                                                                                                                                                                        | Location                                                   | Principal<br>nuclear<br>contractor | Type                                                                                 | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t)      | Initial<br>criticality<br>(yr mo) | Shut down<br>permanently<br>(yr mo) | Comment                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------|---------------------------------|-----------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Boiling Nuclear Superheater Power<br>Station (AEC and Puerto Rico<br>Water Resources Authority)<br>Carollinas-Virginia Tube Reactor<br>(Carolinas-Virginia Nuclear<br>Power Associates, Inc.) [50-114]                                                                                    | Punta Higuera, PR<br><br>Parr, SC                          | Comb.<br><br>West.                 | Boiling water,<br>integral nuclear<br>superheat<br>Pressure tube,<br>heavy water     | 16.5<br><br>17.0                  | 50.0<br><br>64.0                | 64 00<br><br>63 00                | 68 00<br><br>67 01                  | The last CVTR shutdown occurred<br>1/24/67. A license amendment<br>issued 6/14/67 authorizes CVNPA<br>to possess but not operate the CVTR.<br>Byproduct license (state).<br>SAFSTOR approved.                                                                                                            |
| Dresden Nuclear Power Station, Unit 1<br>(Commonwealth Edison Co.) [50-010]<br>Elk River Reactor (AEC and Rural<br>Cooperative Power Association)                                                                                                                                         | Morris, IL<br><br>Elk River, MN                            | GE<br><br>AC                       | Boiling water<br><br>Boiling water                                                   | 200.0<br><br>22.0                 | 700.0<br><br>58.2               | 59 00<br><br>62 00                | 78 10<br><br>68 02                  | The Elk River Reactor was shut down due<br>to technical problems in February 1968;<br>in 1974, dismantling and removal of<br>this facility was completed.<br>Project management assigned to NRC Nuclear<br>Materials, Safety, Safeguards and Operations<br>Support. SAFSTOR approved.<br>DECON approved. |
| Enrico Fermi Atomic Power Plant, Unit 1<br>(Power Reactor Development Co.) [50-16]<br><br>Fort St. Vrain Nuclear Generating<br>Station (Public Service Company of<br>Colorado) [50-267]<br>Hallam Nuclear Power Facility,<br>Sheldon Station (AEC and Consumers<br>Public Power District) | Lagoona Beach, MI<br><br>Platteville, CO<br><br>Hallam, NE | PRDC<br><br>GA<br><br>AI           | Sodium cooled,<br>fast<br><br>High temperature,<br>gas cooled<br><br>Sodium graphite | 60.9<br><br>330.0<br><br>75.0     | 200.0<br><br>842.0<br><br>240.0 | 63 00<br><br>74 01<br><br>62 00   | 72 09<br><br>89 08<br><br>64 09     | The Hallam Nuclear Power Facility<br>was shut down in September 1964<br>due to moderator-can failures.<br>Entombment of the reactor was<br>completed in 1968.<br>SAFSTOR approved.                                                                                                                       |
| Humboldt Bay Power Plant, Unit 3<br>(Pacific Gas & Electric Co.) [50-133]<br>Indian Point Station, Unit 1<br>(Consolidated Edison Co. of<br>New York, Inc.) [50-3]                                                                                                                        | Eureka, CA<br><br>Buchanan, NY                             | GE<br><br>B&W                      | Boiling water<br><br>Pressurized<br>water                                            | 65.0<br><br>265.0                 | 242.0<br><br>615.0              | 63 00<br><br>62 00                | 76 07<br><br>74 10                  | In the Consolidated Edison Indian Point<br>Station, the 615 MW(t) was increased<br>by an oil-fired superheater to produce<br>265 MW(e) net. Possession only license,<br>6/19/80. Ordered not to operate.<br>SAFSTOR approved.                                                                            |
| La Crosse (Genoa) Nuclear Generating<br>Station (Dairyland Power Cooperative)<br>[50-409]<br>Pathfinder Atomic Plant (Northern<br>States Power Co.) [50-130]                                                                                                                              | La Crosse, WI<br><br>Sioux Falls, SD                       | AC<br><br>AC                       | Boiling water<br><br>Boiling water                                                   | 48.0<br><br>58.5                  | 165.0<br><br>190.0              | 67 07<br><br>64 00                | 87 04<br><br>67 09                  | Decommissioned, but some residual reactivity<br>remains in turbine, which is licensed under<br>10 CFR Part 30. Presently operating as a gas<br>fired plant.<br>SAFSTOR approved.                                                                                                                         |
| Peach Bottom Atomic Power Station, Unit 1<br>(Philadelphia Electric Co.) [50-171]                                                                                                                                                                                                         | Peach Bottom, PA                                           | GA                                 | High temperature,<br>gas cooled                                                      | 40.0                              | 115.0                           | 66 00                             | 74 10                               | SAFSTOR approved.                                                                                                                                                                                                                                                                                        |

## 1. POWER REACTORS

### A. Central-Station Electric Power Plants (Continued)

| Name (licensee)<br>[docket number]                                                                    | Principal<br>nuclear<br>contractor | Location         | Type                            | Power<br>capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut down<br>permanently<br>(yr mo) | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------|------------------------------------|------------------|---------------------------------|--------------------------------|----------------------------|-----------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Piqua Nuclear Power Facility (AEC and<br>City of Piqua)                                               | AI                                 | Piqua, OH        | Organic cooled<br>and moderated | 11.4                           | 45.5                       | 63 00                             | 66 00                               | The dismantlement program for the<br>Piqua Nuclear Power Facility was<br>completed in February 1969.<br>Possession only license, 3/92.                                                                                                                                                                                                                                                                                                                                                     |
| Rancho Seco Nuclear Generating Station,<br>Unit 1 (Sacramento Municipal Utility<br>District) [50-312] | B&W                                | Clay Station, CA | Pressurized<br>water            | 873.0                          | 2,772.0                    | 74 09                             | 89 06                               | Possession only license, 3/9/93.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| San Onofre Nuclear Generating Station, Unit 1<br>(Southern California Edison) [50-206]                | West.                              | San Clemente, CA | Pressurized<br>water            | 436.0                          | 1,347.0                    | 67 06                             | 92 11                               | The first core for the Shippingport station<br>began power operation in 1957 with a<br>capacity rating of 60 MW(e). The second<br>core began power operation in 1965<br>with a capacity rating of 90 MW(e).<br>The third core, a light water breeder<br>reactor (LWBR), began power opera-<br>tion in 1977, with a capacity rating of<br>60 MW(e). Owned by the Department<br>of Energy, the reactor plant was shut<br>down on Oct. 1, 1982. Defueling was<br>completed in September 1984. |
| Shippingport Atomic Power Station (DOE<br>and Duquesne Light Co.)                                     | West.                              | Shippingport, PA | Pressurized<br>water            | 60.0                           | 236.0                      | 57 00                             | 82 10                               | Decommissioning was completed in<br>December 1989, and the site was released<br>for use without any restrictions.<br>Possession only license, 7/20/91. DECON<br>approved.                                                                                                                                                                                                                                                                                                                  |
| Shoreham Nuclear Power Station<br>(Long Island Lighting Co.) [50-322]                                 | GE                                 | Brookhaven, NY   | Boiling water                   | 820.0                          | 2,436.0                    | 85 02                             | 91 07                               | Three Mile Island Nuclear Station, Unit 2,<br>has been shut down since the 3/28/79<br>accident. Core removal is finished.<br>Post defueled monitored storage.<br>Possession only license, 9/14/93.                                                                                                                                                                                                                                                                                         |
| Three Mile Island Nuclear Station, Unit 2<br>(GPU Nuclear Corp.) [50-320]                             | B&W                                | Middletown, PA   | Pressurized<br>water            | 906.0                          | 2,772.0                    | 78 00                             | 79 00                               | Possession only license, 5/5/93.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Trojan Nuclear Plant, Unit 1 (Portland<br>General Electric Co.) [50-344]                              | West.                              | Prescott, OR     | Pressurized<br>water            | 1075.0                         | 3411.0                     | 75 12                             | 92 11                               | Licensee announced permanent shutdown,<br>2/92. Possession only license, 8/92.<br>SAFSTOR/DECON approved.                                                                                                                                                                                                                                                                                                                                                                                  |
| Yankee Nuclear Power Station (Yankee<br>Atomic Electric Co.) [50-029]                                 | West.                              | Rowe, MA         | Pressurized<br>water            | 167.0                          | 600.0                      | 60 08                             | 92 02                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### B. Dual-Purpose Plants

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

## PART I CIVILIAN REACTORS (DOMESTIC)



## C. Propulsion (Maritime)

| Name and/or owner<br>[docket number]                           | Nuclear designer | Shipbuilder | Type                 | Maximum<br>shaft<br>horsepower | Licensed<br>power<br>MW(e) | Start-<br>up<br>(yr mo) | Shut<br>down<br>(yr mo) | Comment                              |
|----------------------------------------------------------------|------------------|-------------|----------------------|--------------------------------|----------------------------|-------------------------|-------------------------|--------------------------------------|
| Nuclear Ship SAVANNAH<br>(Maritime Administration)<br>[50-238] | B&W              | NYSC        | Pressurized<br>water | 22,000                         | 80.0                       | 61 00                   | 71 00                   | In SAFSTOR, possession only license. |

## 2. EXPERIMENTAL POWER-REACTOR SYSTEMS

### A. Electric-Power Systems

| Name (Regulatory agency).<br>Location<br>[docket number]                             | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Design, Type,<br>Principal<br>nucl. contr.                           | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Boiling Reactor Experiment<br>No. 1 (DOE), INEL Site, ID                             |                                | 1,400.0                    |                              |                                   |                            | 53 00                             | 54 00                   | BORAX-1<br>Boiling<br>water. ANL                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Boiling Reactor Experiment<br>No. 5 (DOE), INEL Site, ID                             | 2,600.0                        | 20,000.0                   |                              |                                   |                            | 62 00                             | 64 00                   | BORAX-5<br>Boiling water,<br>integral<br>nuclear super-<br>heat. ANL |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Boiling Reactor Experiments<br>(DOE), INEL Site, ID                                  | 2,400.0                        | 15,500.0                   |                              |                                   |                            | 54 00                             | 58 06                   | BORAX-2,-3,-4.<br>Boiling water.<br>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. Owner: Empire States Atomic Development Associates and General Electric Company. In SAFSTOR, possession only license. |
| ESADA Vallecitos Experimental<br>Superheat Reactor (NRC).<br>Pleasanton, CA [50-183] |                                | 17,000.0                   |                              |                                   |                            | 63 00                             | 67 02                   | EBESR. Light-<br>water mod-<br>erated, super-<br>heater. GE          | The EBOR reactor experiment was terminated in December 1966 prior to completion of construction.                                                                                                                                                                                                                                                                                                                                                                                                      |
| Experimental Beryllium Oxide<br>Reactor (DOE), INEL Site, ID                         |                                | 10,000.0                   |                              |                                   |                            |                                   |                         | EBOR. Gas cooled,<br>BeO moderated.<br>GA                            | The EBWR achieved 100,000 kW(t) 11/11/62. Operation of EBWR in the Boiling Water Program was closed out 12/62. The reactor was used in support of the Plutonium Recycle Program and attained criticality using plutonium as its principal fuel 9/22/65. In support of that program, it operated at power levels as high as 70,000 kW(t). Operation in that program was completed 6/67.                                                                                                                |
| Experimental Boiling Water<br>Reactor (DOE), Argonne, IL                             | 4,000.0                        | 100,000.0                  |                              |                                   |                            | 56 00                             | 67 06                   | EBWR. Boiling<br>water. ANL                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## 2. EXPERIMENTAL POWER-REACTOR SYSTEMS

## PART I CIVILIAN REACTORS (DOMESTIC)

### A. Electric-Power Systems (Continued)

| Name (Regulatory agency).<br>Location<br>[docket number]                   | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Desig. Type.<br>Principal<br>nucl. contr.                                             | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Experimental Breeder Reactor<br>No. 1 (DOE). INEL Site, ID                 | 150.0                          | 1,400.0                    |                              |                                   |                            | 51 00                             | 64 00                   | EBR-1. NaK-cooled,<br>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 1953, the feasibility of breeding and the compatibility with breeding economy of sodium-potassium alloy as a liquid-metal coolant. It operated with a plutonium-bearing core (Mark IV) from 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 Breeder Reactor II<br>(DOE). INEL Site, ID                    | 20,000.0                       | 62,500.0                   |                              |                                   |                            | 61 09                             | 94 09                   | EBR-II. Sodium<br>cooled, fast. ANL                                                   | EBR-II achievements include irradiation of tens of thousands of specimens of fuel, structural and absorber materials; generation of several billion kilowatt-hours of electricity; co-generation of steam for ANL-West site heating; in situ demonstration of advanced instrumentation concepts; and full-scale demonstration of a diversion-proof system for fuel reprocessing. Historic LOF and LOHS accident simulations performed in 1986, fully demonstrated the passive safety features inherent in the pool-type design using metal fuel. The EGCR project was terminated 1/66 prior to the completion of construction. |
| Experimental Gas Cooled<br>Reactor (DOE). Oak Ridge, TN                    | 21,900.0                       | 84,300.0                   |                              |                                   |                            |                                   |                         | EGCR. Gas cooled,<br>graphite moderated, KE-AC                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Experimental Organic Cooled<br>Reactor (DOE). INEL Site, ID                |                                | 40,000.0                   |                              |                                   |                            |                                   |                         | EOCR. Organic<br>cooled and moderated. Fluor-Al                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Heavy Water Components Test<br>Reactor (DOE). SRL, Aiken, SC               |                                | 61,100.0                   |                              |                                   |                            | 62 00                             | 64 00                   | HWCTR. Pressurized<br>heavy water.<br>Du Pont                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Homogeneous Reactor Experiment<br>No. 1 (DOE). Oak Ridge, TN               | 140.0                          | 1,000.0                    |                              |                                   |                            | 52 00                             | 54 00                   | HRE-1. Aqueous<br>homogeneous<br>solution (UO <sub>2</sub> SO <sub>4</sub> ).<br>ORNL |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Homogeneous Reactor Experiment<br>No. 2 (DOE). Oak Ridge, TN               | 300.0                          | 5,200.0                    |                              |                                   |                            | 57 00                             | 61 00                   | HRE-2. Aqueous<br>homogeneous<br>solution (UO <sub>2</sub> SO <sub>4</sub> ).<br>ORNL | EOCR construction was terminated 12/62. The facility was mothballed prior to operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Los Alamos Molten Plutonium<br>Reactor Experiment (DOE).<br>Los Alamos, NM |                                | 1,000.0                    |                              |                                   |                            | 61 00                             | 63 00                   | LAMPRE-1. Fast<br>molten plutonium<br>fueled, sodium<br>cooled. LANL                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Los Alamos Power Reactor<br>Experiment No. 1 (DOE).<br>Los Alamos, NM      |                                | 2,000.0                    |                              |                                   |                            | 56 00                             | 57 00                   | LAPRE-1. Aqueous<br>homogeneous<br>(phosphoric acid).<br>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       | Owner: Saxton Nuclear Experimental Corp. In SAFSTOR, possession only license.                                                                                                                           |
| Molten Salt Reactor Experiment (DOE). Oak Ridge, TN                     | 8,000.0  | 65 00 | 69 00 | MSRE. Single region, graphite moderated. ORNL              | SRE operated at 20 MW(t) until shut down 2/64 for modification to permit an increase in power level to 30 MW(t). On 12/2/66, deactivation was announced. Owners: DOE and Southern California Edison Co. |
| Organic Moderated Reactor Experiment (DOE). INEL Site, ID               | 12,000.0 | 57 00 | 63 00 | OMRE. Organic cooled and moderated. AI                     | Owner: Southwest Atomic Energy Associates. In SAFSTOR, byproduct license (state).                                                                                                                       |
| Plutonium Recycle Test Reactor (DOE). Richland, WA                      | 70,000.0 | 60 00 | 69 00 | PRTR. Pressure tube, heavy water moderated and cooled. WHC | Owner: General Electric Company and Pacific Gas & Electric Co. SAFSTOR approved.                                                                                                                        |
| Saxton Nuclear Experimental Reactor Project (NRC). Saxton, PA [50-146]  | 3,000.0  | 62 00 | 72 00 | No Desg. Pressurized water. West.                          |                                                                                                                                                                                                         |
| Sodium Reactor Experiment (DOE). Santa Susana, CA                       | 5,700.0  | 57 00 | 64 02 | SRE. Sodium graphite. AI                                   |                                                                                                                                                                                                         |
| Southwest Experimental Fast Oxide Reactor (NRC). Strickler, AR [50-231] | 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 [50-18]          | 5,000.0  | 57 00 | 63 12 | VBWR. Boiling water. GE                                    |                                                                                                                                                                                                         |

## B. Space Nuclear Auxiliary Power (SNAP)

| Name (Regulatory agency). Location [docket number]        | 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                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------|--------------------------|----------------------|------------------------|-----------------------------|----------------------|-----------------------------|-------------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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-TSP. NaK-cooled. AI-ORNL                   |                                                                                                                                                                                                                                                                                                                                                                        |
| SNAP-08 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. |

## 2. EXPERIMENTAL POWER-REACTOR SYSTEMS

### B. Space Nuclear Auxillary Power (SNAP) (Continued)

| Name (Regulatory agency).<br>Location<br>[docket number]               | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Desig. Type.<br>Principal<br>nucl. contr. | Comment                                            |
|------------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|-------------------------------------------|----------------------------------------------------|
| SNAP-10A Flight System (DOE).<br>Oak Ridge, TN                         |                                |                            |                              | 0.5                               | 39.0                       | (Spare)                           |                         | SI0FS-5.<br>NaK-cooled. AI                |                                                    |
| SNAP-10A Flight System<br>Ground Test No. 1 (DOE).                     |                                |                            |                              | 0.5                               | 39.0                       | 64 00                             | 64 00                   | SI0FS-1.<br>NaK-cooled. AI                |                                                    |
| SNAP-10A Flight System<br>Ground Test No. 3 (DOE).<br>Santa Susana, CA |                                |                            |                              | 0.5                               | 39.0                       | 64 00                             | 66 00                   | SI0FS-3.<br>NaK-cooled. AI                | See comment for SNAP-10 Flight System,<br>SI0FS-4. |

### C. Space Propulsion

| Name (Regulatory agency).<br>Location<br>[docket number]               | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Designation.<br>Type. Principal<br>nuclear<br>contractor | Comment |
|------------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|----------------------------------------------------------|---------|
| Fuel Element Test Bed (DOE).<br>NRDS, NV                               |                                |                            | 44,000.0                     |                                   |                            | 72 00                             | 72 00                   | NF-1. Open cycle,<br>gaseous hydrogen.<br>LANL           |         |
| Fuel Element Test Reactor (DOE).<br>NRDS, NV                           |                                |                            | 514,000.0                    |                                   |                            | Indef.                            | 68 00                   | Pewee-1. Open<br>cycle, liquid<br>hydrogen. LANL         |         |
| Fuel Element Test Reactor (DOE).<br>NRDS, NV                           |                                |                            | 514,000.0                    |                                   |                            | Indef.                            | 73 00                   | Pewee-2. Open<br>cycle, liquid<br>hydrogen. LANL         |         |
| Ground Experimental Engine<br>Experiment (DOE). NRDS, NV               |                                |                            | 1,100,000.0                  |                                   |                            | Indef.                            | 73 00                   | XB-Backup. Open<br>cycle, liquid<br>hydrogen.            |         |
| Ground Experimental Engine<br>Experiment (DOE). NRDS, NV               |                                |                            | 1,100,000.0                  |                                   |                            | 68 00                             | 69 00                   | AG-West.<br>XE-Prime. Open<br>cycle, liquid<br>hydrogen. |         |
| Nuclear Rocket Engine Reactor<br>Experiment (NERVA) (DOE).<br>NRDS, NV |                                |                            | 109,600.0                    |                                   |                            | 64 00                             | 64 00                   | NRX-A2. Open<br>cycle, liquid<br>hydrogen.               |         |
| Nuclear Rocket Engine Reactor<br>Experiment (NERVA) (DOE).<br>NRDS, NV |                                |                            | 1,100,000.0                  |                                   |                            | 65 00                             | 65 00                   | AG-West.<br>NRX-A3. Open<br>cycle, liquid<br>hydrogen.   |         |
| Nuclear Rocket Engine Reactor<br>Experiment (NERVA) (DOE).<br>NRDS, NV |                                |                            | 1,120,000.0                  |                                   |                            | 66 00                             | 66 00                   | AG-West.<br>NRX-A5. Open<br>cycle, liquid<br>hydrogen.   |         |
| Nuclear Rocket Engine Reactor<br>Experiment (NERVA) (DOE).<br>NRDS, NV |                                |                            | 1,199,000.0                  |                                   |                            | 67 00                             | 67 00                   | AG-West.<br>NRX-A6. Open<br>cycle, liquid<br>hydrogen.   |         |

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).<br>Location<br>[docket number]          | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Designation.<br>Type. Principal<br>nuclear<br>contractor | Comment                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Engineering Test Reactor (DOE).<br>INEL, ID                       |                                |                            | 175,000.0                    |                                   |                            | 57 00                             | 81 00                   | ETR. Tank KE-GB.                                         | Reactor was shut down in 1973 for modifica-<br>tions and insertion of Sodium Loop Safety<br>Facility (SLSF) loop. Operation resumed in 1975.<br>Deactivated in 1981 and no longer operable.<br>The Fast Flux Test Facility initiated shutdown<br>activities 12/93.<br>In SAFSTOR, possession only license. |
| Fast Flux Test Facility (DOE).<br>Hanford Site, WA                |                                |                            | 291,000.0                    |                                   |                            | 80 02                             | 93 12                   | FFTF. Sodium cooled,<br>loop. WHC                        |                                                                                                                                                                                                                                                                                                            |
| General Electric Testing Reactor<br>(NRC). Pleasanton, CA [50-70] |                                |                            | 50,000.0                     |                                   |                            | 58 00                             | 77 00                   | GETR. Tank. Owner.                                       |                                                                                                                                                                                                                                                                                                            |

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### PART I CIVILIAN REACTORS (DOMESTIC)

#### A. General Irradiation Test (Continued)

| Name (Regulatory agency).<br>Location<br>[docket number]      | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Designation.<br>Type. Principal<br>nuclear<br>contractor | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Materials Testing Reactor (DOE).<br>INEL, ID                  |                                |                            | 40,000.0                     |                                   |                            | 52 00                             | 70 00                   | MTR. Tank.<br>ORNL-ANL-<br>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.<br>In SAFSTOR, possession only license.<br>In SAFSTOR, possession only license. |
| Plum Brook Reactor Facility (NRC).<br>Sandusky, OH [50-30]    |                                |                            | 60,000.0                     |                                   |                            | 61 00                             | 74 00                   | NASA-TR. Tank.<br>NASA                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Westinghouse Testing Reactor<br>(NRC). Waltz Mill, PA [50-22] |                                |                            | 60,000.0                     |                                   |                            | 59 00                             | 62 00                   | WTR. Tank.<br>Owner                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

#### B. High-Power Research and Test

|                                                                                              |  |  |          |  |  |       |       |                           |                                      |
|----------------------------------------------------------------------------------------------|--|--|----------|--|--|-------|-------|---------------------------|--------------------------------------|
| Ames Laboratory Research Reactor<br>(DOE). Ames, IA                                          |  |  | 5,000.0  |  |  | 65 00 | 77 00 | ALRR. Heavy<br>water. AMF |                                      |
| Babcock & Wilcox Nuclear<br>Development Center Test Reactor<br>(NRC). Lynchburg, VA [50-200] |  |  | 6,000.0  |  |  | 64 00 | 71 00 | BAWTR. Pool.<br>Owner     | In SAFSTOR, byproduct license (NRC). |
| Chicago Pile No. 5 (DOE).<br>Argonne, IL                                                     |  |  | 5,000.0  |  |  | 54 02 | 79 09 | CP-5. Heavy,<br>water ANL |                                      |
| Cintichem, Inc. Reactor (NRC).<br>Sterling Forest, NY [50-54]                                |  |  | 5,000.0  |  |  | 61 00 | 90 00 | CINR. Pool.<br>AMF        | DECON approved.                      |
| Industrial Reactor Laboratories,<br>Inc. (NRC). Plainsboro, NJ [50-17]                       |  |  | 5,000.0  |  |  | 58 00 | 75 00 | IRL. Pool.<br>AMF         | License terminated, 11/4/77.         |
| Oak Ridge Research Reactor<br>(DOE). Oak Ridge, TN                                           |  |  | 30,000.0 |  |  | 58 00 | 87 00 | ORR. Tank. ORNL           | Shut down—Defueled.                  |
| Omega West Reactor (DOE). Los<br>Alamos, NM                                                  |  |  | 8,000.0  |  |  | 56 00 | 94 00 | OWR. Tank.<br>LANL        |                                      |
| Sandia Engineering Reactor<br>(DOE). Kirtland AFB, NM                                        |  |  | 5,000.0  |  |  | 61 00 | 70 00 | SER. Tank. Sandia         | Shut down—Defueled.                  |

#### C. Safety Research and Test

|                                                         |  |  |          |  |  |       |       |                                     |                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------|--|--|----------|--|--|-------|-------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| King Intense Neutron Generator<br>(DOE). Los Alamos, NM |  |  |          |  |  | 72 00 | 77 00 | Kinglet.<br>Homogeneous.<br>LANL    | Transient.                                                                                                                                                                                                                                                                                                                                                                                                 |
| Kiwi-Transient Test Reactor<br>(DOE). NRDS, NV          |  |  |          |  |  | 65 00 | 65 00 | Kiwi-TTR.<br>Kiwi/NERVA.<br>LANL    |                                                                                                                                                                                                                                                                                                                                                                                                            |
| Loss of Fluid Test (DOE).<br>INEL, ID                   |  |  | 55,000.0 |  |  | 78 00 | 85 07 | LOFT. Pressurized<br>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).<br>INEL, ID                       | 28,000.0 | 73 00 | 92 00 | PBF. Open tank.<br>EG&G-ID                                       |
| SNAP-10A Transient Test No. 2<br>(DOE), INEL, ID              |          | 65 00 | 66 01 | SNAPTRAN-2.<br>Be-reflected<br>SNAP-10A.<br>AL-PPC               |
| SNAP-10A Transient Test No. 3<br>(DOE), INEL, ID              |          | 64 00 | 64 00 | SNAPTRAN-3.<br>H <sub>2</sub> O-reflected<br>SNAP-10A.<br>PPC-AI |
| Special Power Excursion Reactor<br>Test No. 1 (DOE), INEL, ID |          | 55 00 | 64 00 | SPERT-1. Open<br>tank. PPC                                       |
| Special Power Excursion Reactor<br>Test No. 2 (DOE), INEL, ID |          | 60 00 | 65 00 | SPERT-2.<br>Pressurized<br>water. PPC                            |
| Special Power Excursion Reactor<br>Test No. 3 (DOE), INEL, ID |          | 58 00 | 68 00 | SPERT-3.<br>Pressurized<br>water. PPC                            |
| Special Power Excursion Reactor<br>Test No. 4 (DOE), INEL, ID |          | 62 00 | 70 00 | SPERT-4.<br>Pool. INC                                            |

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 postulated for SNAP reactor systems. SNAPTRAN-1 was converted to SNAPTRAN-2 for destructive testing 1/66.

## D. General Research

|                                                                              |       |       |       |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------|-------|-------|-------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accelerator Pulsed Fast Critical<br>Assembly (NRC), La Jolla, CA<br>[50-253] | 1.0   | 67 00 | 73 00 | APFA-III. Fast.<br>GA                       | The APFA-III was previously operated as the KUKLA Prompt Critical Assembly at Lawrence Livermore National Laboratory at Livermore, CA. License terminated 8/10/73. 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.<br>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. |
| American Standard Inc. (NRC).<br>Mountain View, CA                           |       | 58 00 | 60 00 | UTR-1.<br>Graphite/water.<br>AS, Inc.       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Annular Core Pulsed Reactor<br>(DOE), Kirtland AFB, East, NM                 |       | 67 00 | 77 00 | ACPR. U-Zr<br>hydride. GA                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Argonne CP-3, rebuilt as<br>CP-3' (DOE), Palos Park, IL                      | 300.0 | 44 00 | 63 00 | CP-3'. Heavy<br>water. Met. Lab.            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Argonne Fast Source Reactor (DOE).<br>INEL Site, ID                          | 1.0   | 59 00 | 93 00 | AFSR. Fast.<br>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 Low Power Research<br>Reactor (DOE), Argonne, IL                     | 250.0 | 62 00 | 70 00 | Juggernaut.<br>Graphite/water.<br>ANL       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Argonne National Laboratory<br>(DOE), Argonne, IL                            |       | 57 00 | 72 00 | AGN-201-108.<br>Homog. solid. AGN           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Argonne Nuclear Assembly<br>for University Training<br>(DOE), Argonne, IL    | 10.0  | 57 00 | 72 00 | Argonaut (CP-11).<br>Graphite/water.<br>ANL |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Argonne Thermal Source<br>Reactor (DOE), Argonne, IL                         | 10.0  | 57 00 | 88 00 | ATSR. Thermal. ANL                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### PART I CIVILIAN REACTORS (DOMESTIC)

#### D. General Research (Continued)

| Name (Regulatory agency).<br>Location<br>[docket number]                                                          | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Designation.<br>Type. Principal<br>nuclear<br>contractor                            | Comment                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Atomics International<br>(NRC). Canoga Park, CA [50-50]                                                           |                                |                            |                              |                                   |                            |                                   |                         | L-47. Homogeneous.                                                                  | License terminated 6/30/58.                                                                                                                                                                                                                                                                                                                                                                                            |
| Babcock & Wilcox Lynchburg<br>Pool Reactor (NRC).<br>Lynchburg, VA [50-99]                                        |                                | 1,000.0                    |                              |                                   |                            | 57 00                             | 58 00                   | AI                                                                                  | License terminated 7/20/82.                                                                                                                                                                                                                                                                                                                                                                                            |
| Battelle Memorial Institute<br>(NRC). West Jefferson, OH [50-6]                                                   |                                | 2,000.0                    |                              |                                   |                            | 56 00                             | 74 00                   | BRR. Pool. AMF                                                                      | License terminated 12/22/87.                                                                                                                                                                                                                                                                                                                                                                                           |
| Brookhaven Graphite Research<br>Reactor (DOE). Upton, NY                                                          |                                | 20,000.0                   |                              |                                   |                            | 50 00                             | 69 00                   | BGRR. Air cooled,<br>graphite mod-<br>erated. AU, Inc.<br>SCHIZO. Tank. AU,<br>Inc. |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Brookhaven Neutron Source<br>Reactor No. 1 (DOE).<br>Upton, NY                                                    |                                | 100.0                      |                              |                                   |                            | 58 00                             | 70 00                   | PHRENTIC. Tank. AU,<br>Inc.                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Brookhaven Neutron Source<br>Reactor No. 2 (DOE).<br>Upton, NY                                                    |                                | 100.0                      |                              |                                   |                            | 65 00                             | 70 00                   | BSR. Pool. ORNL                                                                     | Shut down—to be defueled.                                                                                                                                                                                                                                                                                                                                                                                              |
| Bulk Shielding Reactor (DOE).<br>Oak Ridge, TN                                                                    |                                | 2,000.0                    |                              |                                   |                            | 50 00                             | 91 00                   | CP-2. Graphite.<br>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.<br>License terminated 12/2/66.                                                                                                                                                                                                                              |
| Chicago Pile 1, rebuilt as<br>CP-2 (DOE). Chicago, IL                                                             |                                | 0.2                        |                              |                                   |                            | 42 00                             | 54 00                   | CWRR. Pool. Owner                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Curtiss-Wright Nuclear Research<br>Laboratory of the Commonwealth of Pennsylvania (NRC).<br>Quehanna, PA [50-310] |                                | 1,000.0                    |                              |                                   |                            | 58 00                             | 66 00                   |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| DOE Demonstration Reactor<br>(DOE). Oak Ridge, TN                                                                 |                                | 10.0                       |                              |                                   |                            | 69 00                             | 69 00                   | Demo React. Pool.<br>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<br>(DOE). Oak Ridge, TN                                                            |                                | 10.0                       |                              |                                   |                            | 63 00                             | 69 00                   | EAEP. Pool.<br>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<br>(DOE). Upton, NY                                                                   |                                |                            |                              |                                   |                            | 67 00                             | 70 00                   | BNL/FS-1. Fast.                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| General Atomics Technologies<br>(DOE). San Diego, CA                                                              |                                | 50.0                       |                              |                                   |                            | 60 00                             | 60 00                   | BNL<br>TRIGA-Mk II. U-Zr<br>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 (NRC), Chicago, IL [50-1] | 75.0    | 56 00 | 67 00 | ARR (L-54), Homogeneous, AI                            | Owner: Armour Research Foundation. License terminated 4/28/72.                                                                                                                                                                                                                                                                                            |
| JANUS Reactor (DOE), Argonne, IL                                              | 200.0   | 64 00 | 92 00 | JANUS, Tank, ANL                                       |                                                                                                                                                                                                                                                                                                                                                           |
| 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 [50-167]                       |         | 60 00 | 60 00 | No Desg. Pool, Lockheed                                | License terminated 9/1/60.                                                                                                                                                                                                                                                                                                                                |
| 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 (SUSIB) 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 [50-185]                             | 100.0   | 63 00 | 73 00 | MUR, LWR, Lockheed                                     | Possession only license, 8/1/73.                                                                                                                                                                                                                                                                                                                          |
| 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 [50-187]                 | 1,000.0 | 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. License terminated 6/29/86.                                                                                                                                                                                                              |
| 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.                                                                                                                                   |

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

#### D. General Research (Continued)

| Name (Regulatory agency).<br>Location<br>[docket number]           | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Designation.<br>Type, Principal<br>nuclear<br>contractor | Comment                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nuclear Effects Reactor (DOE).<br>San Diego, CA                    |                                |                            |                              |                                   |                            | 59 00                             | 64 00                   | KUKLA, Prompt<br>burst, LLNL                             | Ownership of this reactor was transferred<br>to North American Rockwell 12/71 and was<br>redesignated the Nuclear Examination<br>Reactor or L-85 rather than AB-6. The AB-6,<br>also designated WBNS, was built and first<br>operated at Downey, CA. It was moved to<br>Santa Susana in 1956. License terminated 4/8/87.                                                                                   |
| Nuclear Examination Reactor<br>(NRC). Santa Susana, CA [50-375]    |                                |                            | 3.0                          |                                   |                            | 52 00                             | 80 00                   | L-85 (AE-6).<br>Homogeneous, AI                          |                                                                                                                                                                                                                                                                                                                                                                                                            |
| Oak Ridge Graphite Reactor<br>(DOE). Oak Ridge, TN                 |                                |                            | 3,500.0                      |                                   |                            | 43 00                             | 63 00                   | ORG. Graphite, CL                                        |                                                                                                                                                                                                                                                                                                                                                                                                            |
| Pawling Research Reactor<br>(NRC). Pawling, NY [50-101]            |                                |                            |                              |                                   |                            | 58 00                             | 71 00                   | PRR. LWR. UNC                                            | Owner: United Nuclear Corp. License terminated<br>6/25/74.                                                                                                                                                                                                                                                                                                                                                 |
| Physical Constants Test<br>Reactor (DOE). Richland, VA             |                                |                            | 0.1                          |                                   |                            | 55 00                             | 72 00                   | PCTR. Graphite.<br>PNL                                   |                                                                                                                                                                                                                                                                                                                                                                                                            |
| Radiation Effects Reactor<br>(NRC). Dawsonville, GA [50-172]       |                                |                            | 3,000.0                      |                                   |                            | 58 00                             | 70 00                   | RER. Pool.<br>Lockheed                                   | The RER was previously used in the<br>terminated Aircraft Nuclear Propulsion<br>Program. A license authorizing Lockheed<br>to operate the reactor as a commercial<br>facility was issued 7/62, and 8/62 the<br>USAF transferred the facility to the<br>General Services Administration. Lockheed<br>acquired the title to the facility 3/65. License<br>terminated 8/31/71.<br>License terminated 2/11/82. |
| Rockwell International (NRC).<br>Canoga Park, CA [50-94]           |                                |                            |                              |                                   |                            | 58 00                             | 74 00                   | L-77. Homogeneous.<br>AI                                 |                                                                                                                                                                                                                                                                                                                                                                                                            |
| Sandia Pulsed Reactor<br>(DOE). Kirtland AFB, East, NM             |                                |                            |                              |                                   |                            | 61 00                             | 67 00                   | SPR. Prompt burst.<br>Sandia                             |                                                                                                                                                                                                                                                                                                                                                                                                            |
| Shield Test and Irradiation<br>Reactor (DOE). Santa<br>Susana, CA  |                                |                            | 1,000.0                      |                                   |                            | 61 00                             | 72 00                   | STIR. Pool. AI                                           | This reactor was previously designated STF<br>for SNAP Shield Test Facility.                                                                                                                                                                                                                                                                                                                               |
| Thermal Test Reactor No. 2<br>(DOE). Richland, WA                  |                                |                            | 0.1                          |                                   |                            | 55 00                             | 72 00                   | TTR-2. Graphite.<br>PNL                                  |                                                                                                                                                                                                                                                                                                                                                                                                            |
| Torrey Pines, TRIGA-Mk III<br>Reactor (NRC). La Jolla, CA [50-227] |                                |                            | 1,500.0                      |                                   |                            | 66 00                             | 73 00                   | TRIGA-Mk III. U-Zr<br>hydride, Owner                     | Owner: General Atomic. License terminated<br>12/10/75.                                                                                                                                                                                                                                                                                                                                                     |
| Tower Shielding Reactor<br>(DOE). Oak Ridge, TN                    |                                |                            | 500.0                        |                                   |                            | 54 00                             | 58 00                   | TSR. BSR-type in<br>tank. ORNL                           |                                                                                                                                                                                                                                                                                                                                                                                                            |
| Tower Shielding Reactor<br>No. II (DOE). Oak Ridge, TN             |                                |                            | 1,000.0                      |                                   |                            | 60 00                             | 92 00                   | TSR-2. Light<br>water. ORNL                              | Shut down—To be defueled.                                                                                                                                                                                                                                                                                                                                                                                  |
| Transient Reactor Test Facility (DOE).<br>INEL Site, ID            |                                |                            |                              |                                   |                            | 59 00                             | 94 09                   | TREAT.<br>Graphite, ANL                                  | Authorized power, n.a. Transient RX.                                                                                                                                                                                                                                                                                                                                                                       |
| UTR Test Reactor (NRC).<br>Mountain View, CA                       |                                |                            |                              |                                   |                            | 61 00                             | 63 00                   | No Desg. Graphite/<br>water. Owner                       | Owner: American Radiator & Standard<br>Sanitary Corp.                                                                                                                                                                                                                                                                                                                                                      |
| Westinghouse Nuclear Training<br>Center (NRC). Zion, IL [50-87]    |                                |                            | 10.0                         |                                   |                            | 72 00                             | 87 00                   | WNTR. Tank. West.                                        | License terminated 10/27/88.                                                                                                                                                                                                                                                                                                                                                                               |

## E. University Research and Teaching

| Name (Regulatory agency).<br>Location<br>[docket number]                                                                      | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Designation.<br>Type. Principal<br>nuclear<br>contractor | Comment                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Brigham Young University<br>(NRC), Provo, UT [50-262]                                                                         |                                |                            |                              |                                   |                            | 67 00                             | 87 00                   | L-77.<br>Homogeneous. AI                                 | DECON approved.                                                                                                                                                                                                                                                                                                                                                                                     |
| California Polytechnic<br>State University (NRC).<br>San Luis Obispo, CA [50-394]                                             |                                |                            |                              |                                   |                            | 73 00                             | 80 00                   | AGN-201-100.<br>Homog. solid.<br>AGN                     | California Polytechnic State University received<br>a permit in 12/71 to relocate AGN-201-100<br>and operate it on the university's campus.<br>The unit was previously operated starting<br>in 1956 at the Naval Postgraduate School,<br>Monterey, CA, NRC docket No. 50-43.<br>In 1980, AGN-201-100 was shut down and<br>decommissioned. License terminated 7/19/85.<br>License terminated 3/8/91. |
| California, Berkeley,<br>University of (NRC).<br>Berkeley, CA [50-224]                                                        |                                |                            | 1,000.0                      |                                   |                            | 66 00                             | 87 12                   | TRIGA-Mk III.<br>U-Zr hydride.<br>GA                     | License terminated 12/28/93.                                                                                                                                                                                                                                                                                                                                                                        |
| California, Los Angeles,<br>University of, School of<br>Engineering and Applied<br>Science (NRC), Los Angeles,<br>CA [50-142] |                                |                            | 100.0                        |                                   |                            | 60 00                             | 84 00                   | Educator.<br>Graphite/water.<br>AMF                      |                                                                                                                                                                                                                                                                                                                                                                                                     |
| California, Santa Barbara,<br>University of (NRC). Santa<br>Barbara, CA [50-433]                                              |                                |                            |                              |                                   |                            | 74 00                             | 86 00                   | L-77.<br>Homogeneous. AI                                 | License terminated 11/17/89.                                                                                                                                                                                                                                                                                                                                                                        |
| Catholic University of<br>America (NRC).<br>Washington, DC [50-77]                                                            |                                |                            |                              |                                   |                            | 57 00                             | 86 00                   | AGN-201-101.<br>Homog. solid.<br>AGN                     | DECON approved.                                                                                                                                                                                                                                                                                                                                                                                     |
| Colorado State University<br>(NRC), Fort Collins, CO                                                                          |                                |                            |                              |                                   |                            | 57 00                             | 74 00                   | AGN-201-109.<br>Homog. solid.<br>AGN                     |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Columbia University (NRC).<br>New York, NY                                                                                    |                                |                            | 250.0                        |                                   |                            | Licensed                          | 85 00                   | TRIGA-Mk II.<br>U-Zr hydride.<br>GA                      | The Columbia University TRIGA-Mk II was<br>licensed to operate by NRC. However, the<br>City of New York has not authorized<br>operation. Therefore Columbia University<br>has not procured fuel. The license was<br>terminated in 1985.<br>License terminated 2/26/79.                                                                                                                              |
| Delaware, University of<br>(NRC), Newark, DE [50-98]                                                                          |                                |                            |                              |                                   |                            | 58 00                             | 78 00                   | AGN-201-113.<br>Homog. solid.<br>AGN                     |                                                                                                                                                                                                                                                                                                                                                                                                     |
| Georgia Institute of<br>Technology (NRC).<br>Atlanta, GA [50-267]                                                             |                                |                            |                              |                                   |                            | 68 00                             | 85 00                   | AGN-201-104.<br>Homog. solid.<br>AGN                     | AGN-201-104 operated at the University<br>of Akron (Ohio) from 1957 until transferred<br>to the Georgia Institute of Technology in<br>1967. Operations at that facility began in<br>1968. Decommissioning of AGN-201-104<br>was achieved in 1986. License terminated 1/7/86.<br>License terminated 10/5/93.                                                                                         |
| Kansas, University of<br>(NRC), Lawrence, KS [50-148]                                                                         |                                |                            | 250.0                        |                                   |                            | 61 00                             | 87 00                   | Model 4180.<br>Pool. BAC                                 | License terminated 12/19/88.                                                                                                                                                                                                                                                                                                                                                                        |
| Leland Stanford University<br>(NRC), Palo Alto, CA [50-141]                                                                   |                                |                            | 10.0                         |                                   |                            | 59 00                             | 74 00                   | No Desg. Pool.<br>GE                                     |                                                                                                                                                                                                                                                                                                                                                                                                     |

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### PART I CIVILIAN REACTORS (DOMESTIC)

#### E. University Research and Teaching (Continued)

| Name (Regulatory agency).<br>Location<br>[docket number]             | Power<br>capacity<br>net kW(e) | Power<br>licensed<br>kW(t) | Authorized<br>power<br>kW(t) | Power<br>MD capacity<br>net MW(e) | Power<br>licensed<br>MW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Designation.<br>Type, Principal<br>nuclear<br>contractor | Comment                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------|--------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|-----------------------------------|-------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Memphis State University<br>(NRC), Memphis, TN [50-538]              |                                |                            |                              |                                   |                            | 77 00                             | 85 00                   | AGN-201-108.<br>Homog. solid.<br>AGN                     | License terminated 10/19/88.                                                                                                                                                                                                                                                                                                                                                                                       |
| Michigan State University<br>(NRC), East Lansing, MI [50-294]        |                                |                            | 250.0                        |                                   |                            | 69 00                             | 89 00                   | TRIGA-Mk I.<br>U-Zr hydride.<br>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<br>(NRC), State College, MS [50-8]      |                                |                            |                              |                                   |                            |                                   |                         | RRR.<br>Homogeneous.<br>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. License terminated 9/7/66. Late in 1981 it was shipped to Barnwell, SC, for disposal. License terminated 2/24/75. |
| Nevada, University of (NRC).<br>Reno, NV [50-202]                    |                                |                            |                              |                                   |                            | 63 00                             | 74 00                   | L-77.<br>Homogeneous. AI                                 | License terminated 1/13/83.                                                                                                                                                                                                                                                                                                                                                                                        |
| North Carolina State<br>University (NRC).<br>Raleigh, NC [50-111]    |                                |                            | 10.0                         |                                   |                            | 60 00                             | 73 00                   | No Desg.<br>Graphite/water.<br>Cook                      | License terminated 2/14/90.                                                                                                                                                                                                                                                                                                                                                                                        |
| Oklahoma, University of<br>(NRC), Norman, OK [50-112]                |                                |                            |                              |                                   |                            | 58 00                             | 88 00                   | AGN-211-102.<br>Homog. solid,<br>pool. AGN               | License terminated 11/10/81.                                                                                                                                                                                                                                                                                                                                                                                       |
| Oregon State University<br>(NRC), Corvallis, OR [50-106]             |                                |                            |                              |                                   |                            | 58 00                             | 74 00                   | AGN-201-114.<br>Homog. solid.<br>AGN                     |                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Polytechnic Institute of New<br>York (NRC), New York, NY<br>[50-216] |                                |                            |                              |                                   |                            | 67 00                             | 74 00                   | AGN-201M-105.<br>Homog. solid.<br>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. License terminated 12/21/77.                                                                                                                                                                |
| Puerto Rico Nuclear Center<br>(DOE), Mayaguez, PR                    |                                |                            |                              |                                   |                            | 59 00                             | 79 00                   | L-77.<br>Homogeneous. AI                                 | Owner: The Center for Environmental and Energy Research (formerly Puerto Rico Nuclear Center).                                                                                                                                                                                                                                                                                                                     |
| Puerto Rico Nuclear Center<br>(DOE), Mayaguez, PR                    |                                |                            | 2,000.0                      |                                   |                            | 72 00                             | 76 00                   | TRIGA-FLIP.<br>Pool-TRIGA<br>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. License terminated 10/13/93.                                                                                                                                                        |
| Texas at Austin, University<br>of (NRC), Austin, TX [50-192]         |                                |                            | 250.0                        |                                   |                            | 63 00                             | 91 00                   | TRIGA-Mk I.<br>U-Zr hydride.<br>GA                       |                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Tuskegee Institute (NRC).<br>Tuskegee, AL [50-406]                   |                                |                            |                              |                                   |                            | 74 00                             | 84 12                   | AGN-201-102.<br>Homog. solid.<br>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 11/2/84.                                                                                                   |

|                                                                  |       |       |                                                      |                                                      |
|------------------------------------------------------------------|-------|-------|------------------------------------------------------|------------------------------------------------------|
| Utah, University of (NRC).<br>Salt Lake City, UT [50-72]         | 57 00 | 91 00 | AGN-201-107.<br>Homog. solid.<br>AGN                 | DECON approved.                                      |
| Virginia, University of (NRC).<br>Charlottesville, VA [50-396]   | 74 00 | 91 00 | CAVALIER.<br>Reactor type<br>not specified.<br>Owner | DECON approved.                                      |
| Virginia Polytechnic Institute<br>(NRC). Blacksburg, VA [50-124] | 59 00 | 84 00 | UTR-10.<br>Graphite/water.<br>AS Inc.                | License terminated 8/11/88.                          |
| Washington, University of (NRC).<br>Seattle, WA [50-139]         | 61 00 | 90 00 | Educator.<br>Graphite/water.<br>AMF                  | DECON approved.<br>Possession only license, 7/28/94. |
| West Virginia University (NRC).<br>Morgantown, WV [50-129]       | 59 00 | 72 00 | AGN-211-103.<br>Homog. solid,<br>pool. AGN           | License terminated 9/7/84.                           |
| William Marsh Rice University<br>(NRC). Houston, TX [50-114]     | 59 00 | 65 00 | AGN-211-101.<br>Homog. solid,<br>pool. AGN           | License terminated 9/26/67.                          |
| Wyoming, University of (NRC).<br>Laramie, WY [50-122]            | 59 00 | 74 00 | L-77.<br>Homogeneous. AI                             | License terminated 12/5/75.                          |

## 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             |         |
| KB Reactor              | KB 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

## 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------|-------------|----------------------------------------------------|--------------------|-------------------------|------------------------|-----------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hanford 305 Test Reactor<br>Lattice Test Reactor | HTR<br>LTR  | Richland, WA<br>Savannah River Plant,<br>Aiken, SC | Du Pont<br>Du Pont | Graphite<br>Heavy water | 1.0                    | 44 00<br>67 00              | 76 00<br>79 00    | Negligible power.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Process Development Pile                         | PDP         | Savannah River Plant,<br>Aiken, SC                 | Du Pont            | Heavy water             | 1.0                    | 53 00                       | 79 00             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| SR 305-M Test Pile                               | Test Pile   | Savannah River Plant,<br>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. 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). |
| Standard Pile/Subcritical Experimental Complex   | SP/SE       | Savannah River Laboratory, Aiken, SC               | Du Pont            | Graphite                | 2.0                    | 53 00                       | 79 00             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## 1. DEFENSE POWER-REACTOR APPLICATIONS

## PART III MILITARY REACTORS

### 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)<br>Location                                | Designation | Power capacity net kW(e) | Authorized power kW(t) | Initial criticality (yr mo) | Shut down (yr mo) | Principal nuclear reactor type | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------|-------------|--------------------------|------------------------|-----------------------------|-------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Portable Medium Power Plant,<br>No. 1, Sundance, WY                | PM-1        | 1,000.0                  | 9,370.0                | 62 00                       | 68 00             | Martin.                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Portable Medium Power Plant,<br>No. 2A, Camp Century,<br>Greenland | PM-2A       | 1,560.0                  | 10,000.0               | 60 00                       | 63 00             | Pressurized water.<br>Alco.    | 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 (all 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,<br>No. 3A, McMurdo Sound, Antarctica  | PM-3A       | 1,500.0                  | 9,510.0                | 62 00                       | 73 00             | Martin.<br>Pressurized water.  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

Stationary Medium Power Plant  
No. 1, Fort Belvoir, VA  
Stationary Medium Power Plant  
No. 1A, Fort Greely, AK

STURGIS Floating Nuclear Power  
Plant

SM-1 1,855.0 10,000.0 57 00 73 00 Alco.  
Pressurized water.  
SM-1A 1,650.0 20,200.0 62 00 72 00 Alco.  
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.

MH-1A 10,000.0 45,000.0 67 00 76 00 Martin.  
Pressurized water.

## 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  
(yr mo)

Shut-down  
(yr mo)

Comment

|                        |        |                        |       |       |                                                                                                                                            |
|------------------------|--------|------------------------|-------|-------|--------------------------------------------------------------------------------------------------------------------------------------------|
| NAUTILUS               | SSN571 | Electric Boat (Groton) | 54 00 | 80 00 | The SEAWOLF, originally commissioned with a sodium-cooled reactor in 3/57, was recommissioned with a pressurized-water reactor on 9/30/60. |
| 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 | The SCORPION was lost in the Atlantic 5/21/68.                                                                                             |
| SWORDFISH*             | SSN579 | Portsmouth             | 58 00 | 87 00 |                                                                                                                                            |
| SARGO*                 | SSN583 | Mare Island            | 58 00 | 86 00 |                                                                                                                                            |
| SEADRAGON*             | SSN584 | Portsmouth             | 59 00 | 83 00 | The THRESHER was lost in the Atlantic 4/10/63.                                                                                             |
| SKIPACK*               | 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 |                                                                                                                                            |
| 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*    | SSN600 | Mare Island            | 60 00 | 81 00 |                                                                                                                                            |
| ROBERT E. LEE*         | SSN601 | Newport News           | 60 00 | 83 00 |                                                                                                                                            |
| ABRAHAM LINCOLN*       | SSN602 | Electric Boat (Groton) | 60 00 | 81 00 |                                                                                                                                            |
| POLLACK*               | SSN603 | NYSC                   | 63 00 | 88 00 |                                                                                                                                            |
| HADDON*                | SSN604 | NYSC                   | 64 00 | 90 00 |                                                                                                                                            |
| JACK*                  | SSN605 | Portsmouth             | 65 00 | 89 00 |                                                                                                                                            |
| 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 |                                                                                                                                            |

# 1. DEFENSE POWER-REACTOR APPLICATIONS

## B. Propulsion (Naval) (Continued)

| Name (all owned by U.S. Navy) | Designation | Shipbuilder            | Start-up<br>(yr mo) | Shut-down<br>(yr mo) | Comment |
|-------------------------------|-------------|------------------------|---------------------|----------------------|---------|
| GREENLING*                    | SSN614      | GD (Quincy)            | 67 00               | 93 00                |         |
| GATO                          | SSN615      | GD (Quincy)            | 67 00               | 95 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                |         |
| HADDON                        | 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                |         |
| STONEWALL JACKSON*            | SSBN634     | Mare Island            | 64 00               | 94 00                |         |
| NATHANIEL GREENE              | SSBN636     | Portsmouth             | 64 00               | 86 00                |         |
| STURGEON*                     | SSN637      | Electric Boat (Groton) | 66 00               | 94 00                |         |
| WHALE                         | SSN638      | GD (Quincy)            | 68 00               | 95 00                |         |
| BENJAMIN FRANKLIN*            | SSBN640     | Electric Boat (Groton) | 65 00               | 93 00                |         |
| SIMON BOLIVAR*                | SSBN641     | Newport News           | 65 00               | 94 00                |         |
| GEORGE BANCROFT               | SSBN643     | Electric Boat (Groton) | 65 00               | 93 00                |         |
| LEWIS AND CLARK               | SSBN644     | Newport News           | 65 00               | 91 00                |         |
| ASPRO                         | SSN648      | Ingalls                | 68 00               | 94 00                |         |
| PARGO                         | SSN650      | Electric Boat (Groton) | 67 00               | 94 00                |         |
| QUEENFISH*                    | SSN651      | Newport News           | 66 00               | 90 00                |         |
| PUFFER                        | SSN652      | Ingalls                | 69 00               | 95 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 CARVER*     | SSBN656     | Newport News           | 66 00               | 92 00                |         |
| FRANCIS SCOTT KEY*            | SSBN657     | Electric Boat (Groton) | 66 00               | 93 00                |         |
| MARIANO G. VALLEJO*           | SSBN658     | Mare Island            | 66 00               | 94 00                |         |
| WILL ROGERS*                  | SSBN659     | Electric Boat (Groton) | 67 00               | 92 00                |         |
| LAPON                         | SSN661      | Newport News           | 67 00               | 91 00                |         |
| GURNARD                       | SSN662      | Mare Island            | 68 00               | 94 00                |         |
| HAMMERHEAD*                   | SSN663      | Newport News           | 67 00               | 94 00                |         |
| SEA DEVIL                     | SSN664      | Newport News           | 68 00               | 91 00                |         |
| GUITARRO*                     | SSN665      | Mare Island            | 72 00               | 91 00                |         |
| BERGALL                       | SSN667      | Electric Boat (Groton) | 69 00               | 95 00                |         |
| SEA HORSE                     | SSN669      | Electric Boat (Groton) | 69 00               | 95 00                |         |
| FLYING FISH                   | SSN673      | Electric Boat (Groton) | 69 00               | 95 00                |         |
| BLUEFISH                      | SSN675      | Electric Boat (Groton) | 70 00               | 95 00                |         |
| DRUM                          | SSN677      | Mare Island            | 71 00               | 95 00                |         |
| SILVERSIDES                   | SSN679      | Electric Boat (Groton) | 71 00               | 94 00                |         |
| GLENARD P. LIPSCOMB*          | SSN685      | Electric Boat (Groton) | 74 00               | 90 00                |         |
| RICHARD B. RUSSELL            | SSN687      | Newport News           | 74 00               | 93 00                |         |
| BATON ROUGE                   | SSN689      | Newport News           | 77 00               | 93 00                |         |



|                          |        |                        |       |       |
|--------------------------|--------|------------------------|-------|-------|
| OMAHA                    | SSN692 | Electric Boat (Groton) | 77 00 | 95 00 |
| CINCINNATI               | SSN693 | Newport News           | 77 00 | 94 00 |
| NEW YORK CITY            | SSN696 | Electric Boat (Groton) | 78 00 | 96 00 |
| LONG BEACH (2 reactors)  | CGN9   | Bethlehem              | 61 00 | 94 00 |
| BRAINBRIDGE (2 reactors) | CGN25  | Bethlehem              | 62 00 | 95 00 |
| TRUXTUN (2 reactors)     | CGN35  | NYSC                   | 67 00 | 94 00 |
| VIRGINIA (2 reactors)    | CGN38  | Newport News           | 76 00 | 94 00 |
| TEXAS (2 reactors)       | CGN39  | Newport News           | 77 00 | 93 00 |

\*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).<br>Location                                | Designation | Power<br>capacity<br>net kW(e) | Authorized<br>power<br>kW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Reactor type.<br>Principal<br>nuclear<br>contractor | Comment                      |
|----------------------------------------------------------|-------------|--------------------------------|------------------------------|-----------------------------------|-------------------------|-----------------------------------------------------|------------------------------|
| Gas Cooled Reactor Experiment<br>(DOE), INEL Site, ID    | GCRE        |                                | 2,200.0                      | 60 00                             | 62 00                   | Gas cooled, light<br>water moderated.<br>AGN        | No electricity was produced. |
| Mobile Low Power Plant No. 1<br>(DOE), INEL Site, ID     | ML-1        | 300.0                          | 3,300.0                      | 61 00                             | 65 00                   | Gas cooled, light<br>water moderated.<br>AGN        |                              |
| Stationary Low Power Plant No. 1<br>(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).<br>Oak Ridge, TN               | ARE      |  | 1,500.0   | 54 00 | 54 00 | Molten salt. ORNL                                      |  |
| Destroyer Reactor Prototype (DOE).<br>West Milton, NY             | DIG      |  |           | 62 00 | 96 00 | Pressurized water.<br>Lockheed Martin<br>(Formerly GE) |  |
| Experimental Propulsion Test Reactor<br>(DOE), NTS, NV            | TORY IIA |  | 150,000.0 | 60 00 | 61 00 | Air cooled. LLNL                                       |  |
| Experimental Propulsion Test Reactor<br>(DOE), NTS, NV            | TORY IIC |  | 600,000.0 | 64 00 | 64 00 | Air cooled. LLNL                                       |  |
| Heat Transfer Reactor Experiment<br>No. 1 (DOE), INEL Site, ID    | HTRE-1   |  | 20,000.0  | 56 00 | 57 00 | Air cooled. ANPD                                       |  |
| Heat Transfer Reactor Experiment<br>No. 2 (DOE), INEL Site, ID    | HTRE-2   |  | 14,000.0  | 57 00 | 61 00 | Air cooled. ANPD                                       |  |
| Heat Transfer Reactor Experiment<br>No. 3 (DOE), INEL Site, ID    | HTRE-3   |  | 32,000.0  | 58 00 | 61 00 | Air cooled. ANPD                                       |  |
| Large Ship Reactor Prototype (2 reactors)<br>(DOE), INEL Site, ID | A1W      |  |           | 58 00 | 94 00 | Pressurized water.<br>West.                            |  |
| Natural Circulation Test Plant (DOE).<br>INEL Site, ID            | S5G      |  |           | 65 00 | 95 00 | Pressurized water.<br>West.                            |  |
| Small Submarine Reactor<br>Prototype (DOE), Windsor, CT           | S1C      |  |           | 59 00 | 93 00 | Pressurized water.<br>GE                               |  |
| Submarine Advanced Reactor<br>Prototype (DOE), West Milton, NY    | S3G      |  |           | 58 00 | 91 00 | Pressurized water.<br>GE                               |  |
| Submarine Intermediate Reactor<br>Mark A (DOE), West Milton, NY   | S1G      |  |           | 55 00 | 57 00 | Sodium. GE                                             |  |
| Submarine Thermal Reactor Facility<br>(DOE), INEL Site, ID        | S1W      |  |           | 53 00 | 89 10 | Pressurized water.<br>West.                            |  |

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.

### 3. TEST AND RESEARCH

#### A. Test

| Name (Owner).<br>Location                                | Designation | Power<br>capacity<br>net kW(e) | Authorized<br>power<br>kW(t) | Initial<br>criticality<br>(yr mo) | Shut<br>down<br>(yr mo) | Reactor type,<br>Principal<br>nuclear<br>contractor | Comment                                                                       |
|----------------------------------------------------------|-------------|--------------------------------|------------------------------|-----------------------------------|-------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------|
| Aerospace Systems Test Reactor<br>(USAF), Fort Worth, TX | ASTR        | 10,000.0                       | 10,000.0                     | 54 00                             | 71 00                   | LWR. Convair                                        | Defueled in 1971; decommissioning began in 1973 and<br>was completed in 1974. |
| Ground Test Reactor (USAF),<br>Fort Worth, TX            | GTR         | 10,000.0                       | 10,000.0                     | 53 00                             | 73 00                   | Pool. Convair                                       | Decommissioning began in 1973 and was completed in<br>1974.                   |
| Nuclear Engineering Test Reactor<br>(USAF), Dayton, OH   | NETR        | 10,000.0                       | 10,000.0                     | 65 00                             | 70 00                   | Tank. Maxon-AC                                      |                                                                               |

#### B. Research

|                                                                                     |             |         |         |       |       |                       |                                                                              |
|-------------------------------------------------------------------------------------|-------------|---------|---------|-------|-------|-----------------------|------------------------------------------------------------------------------|
| Army Materials Research Reactor<br>(USA). Regulated by NRC.<br>Watertown, MA        | AMRR        | 5,000.0 | 5,000.0 | 60 00 | 70 00 | Pool. BAC             | Army Materials and Mechanics Research Center.<br>License terminated 10/5/93. |
| Diamond Ordnance Radiation Facility<br>(USA). Forest Glen, MD                       | DORF        | 250.0   | 250.0   | 61 00 | 77 00 | TRIGA-Mk F.<br>GA     | Harry Diamond Laboratories.                                                  |
| Naval Research Reactor (USN). Regulated<br>by NRC. Washington, DC [50-4]            | NRR         | 1,000.0 | 1,000.0 | 56 00 | 70 00 | Pool. NRL             | License terminated 3/18/71.                                                  |
| Nuclear Effects Reactor (DOE).<br>NTS, NV                                           | Super KUKLA |         |         | 64 00 | 79 00 | Prompt burst.<br>LLNL | Standby fuel in storage at ORNL.                                             |
| Thermal Test Reactor No. 1 (DOE).<br>Schenectady, NY                                | TTR-1       | 10.0    | 10.0    | 51 00 | 83 00 | Graphite. KAPL        |                                                                              |
| Walter Reed Research Reactor (USA).<br>Regulated by NRC. Washington, DC<br>[50-135] | WRRR        | 50.0    | 50.0    | 62 00 | 70 00 | Homogeneous. AI       | Walter Reed Army Institute of Research. License terminated<br>7/26/72.       |

### PART III MILITARY REACTORS

### 1. POWER REACTORS

#### A. Central-Station Electric Power Plants

| Reactor Name (Owner). Location                                                                          | NRC<br>export<br>license No.<br>and date | Principal<br>nuclear<br>contractor.<br>Reactor type | Power<br>design<br>net MW(e) | Power<br>MW(t) | Author-<br>ized<br>power<br>kW(t) | Initial<br>criti-<br>cality<br>(yr mo) | Shut-<br>down<br>(yr mo) | Comment                             |
|---------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------------|------------------------------|----------------|-----------------------------------|----------------------------------------|--------------------------|-------------------------------------|
| France (Franco-Belgian Society for Nuclear<br>Energy of Ardennes, SENA). Chooz                          | XR-031                                   | West./Fram., ACEC.<br>Pressurized water             | 305.0                        | 1,040.0        | 67 00                             | 67 00                                  | 91 10                    | Decommissioning in process.         |
| Germany, Kraft Nuclear Power Station<br>(Rhine-Westphalia Power Co., RWE).<br>Kahl-am-Main              | 09/30/59                                 | Boiling water                                       | 15.6                         | 60.0           | 61 00                             | 61 00                                  | 85 00                    |                                     |
| Germany (Kernkraftwerk-RWE-Bayernwerk,<br>KRB1). Gundremmingen (near Gunzburg)                          | XR-052                                   | GB.                                                 | 237.0                        | 801.0          | 67 00                             | 67 00                                  | 80 00                    |                                     |
| Italy, Caorso Nuclear Station<br>(ENEL). Piacenza/Cremona                                               | 05/28/64<br>XR-077                       | Boiling water                                       | 840.0                        | 2,651.0        | 79 00                             | 79 00                                  | 87 01                    | Shut down and monitored since 1/87. |
| Italy, Garigliano Nuclear Power Station<br>(Project ENEL of SERN).<br>Punta Fiume (on Garigliano River) | 04/02/71<br>XR-043                       | Boiling water                                       | 150.0                        | 506.0          | 64 00                             | 64 00                                  | 78 00                    |                                     |
| Italy, Trino Vercellese (ENEL).<br>Trino, Piedmont                                                      | 08/16/61                                 | Boiling water                                       | 247.0                        | 870.0          | 65 00                             | 65 00                                  | 87 01                    | Shut down and monitored since 1/87. |
| Japan, Japan Power Demonstration<br>Reactor (JAERD). Tokai-Mura,<br>Ibaraki Pref.                       | XR-044<br>06/14/62<br>XR-045<br>03/16/62 | West.<br>Pressurized water<br>GB.<br>Boiling water  | 12.0                         | 90.0           | 63 08                             | 63 08                                  | 83 01                    |                                     |

### PART IV EXPORT REACTORS

**Great Britain, S5W for HMS  
DREADNOUGHT.**

62.00

Westinghouse was the designer of the reactor. Designation: S5W. No power levels available. As of 2/90 the reactor has been defueled and is not in operational condition.

### A. General Irradiation Test

(No reactors currently in this category)

## 10.5

**The reactor contains some fuel and is still under IAEA jurisdiction.**

**Power: Pulsing.**

**Negligible power.**

This reactor was sold through Gulf Oil licensee, Gutehoffnungshütte Sterkade A.B.

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.

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.

GA.  
TRIGA-Mk III  
AI, L-77A

**XR-075**  
**01/14/71**  
**XR-062**  
**07/28/66**

|         |       |
|---------|-------|
| 72 00   | 82 00 |
| 54 00 - | 77 00 |

**AI. L-54**

68 00

AL. I-54

86 00

AGN.  
AGN-201-111

87 00

AS Inc.  
UTR-B

82.00

## 1. CIVILIAN

## PART V CRITICAL ASSEMBLIES

### Equipment

| Facility (Regulatory Agency)<br>[docket number]                                                          | Designation                | Location                         | Equipment          |                                   | Abbreviation    | Initial<br>criticality<br>(yr mo) | Shut-<br>down<br>(yr mo) | Comment                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------|--------------------|-----------------------------------|-----------------|-----------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                          |                            |                                  | No.<br>of<br>cells | No.<br>control<br>panels/<br>room |                 |                                   |                          |                                                                                                                                                                                                                                                                                                                                                                                                   |
| Bettis Atomic Power Laboratory (DOE)<br>Critical Facility-10, Lynchburg Research<br>Center (NRC) [50-13] | LWBCC<br>SSRF              | Pittsburgh, PA<br>Lynchburg, VA  | 3<br>2             | 3<br>1                            | Bettis<br>CX-10 | 63 00<br>77 00                    | 80 00<br>88 02           | LWB physics.<br>Close storage of spent reactor fuel. License<br>terminated 2/88.                                                                                                                                                                                                                                                                                                                  |
| Los Alamos National Laboratory (DOE)                                                                     | Parka                      | Pejarito Site,<br>Los Alamos, NM | 3                  | 3                                 | LANL, Kiva III  | 63 00                             | 85 00                    | Cold critical for instrumentation testing. Defueled.                                                                                                                                                                                                                                                                                                                                              |
| Los Alamos National Laboratory (DOE)                                                                     | Venus                      | Pejarito Site,<br>Los Alamos, NM | 1                  | 1                                 | LANL, Kiva I    | 76 00                             | 88 00                    | Vertical table assembly machine.                                                                                                                                                                                                                                                                                                                                                                  |
| Oak Ridge Critical Experiments Facility<br>(DOE)                                                         | CEF                        | Oak Ridge, TN                    | 1                  | 1                                 | OR-CEF          | 50 00                             | 92 00                    | Shut down—Defueled.                                                                                                                                                                                                                                                                                                                                                                               |
| ORNL Pool Critical Assembly, BSF Pool<br>(DOE)                                                           | PCA                        | Oak Ridge, TN                    | 1                  | 1                                 | ORNL-PCA        | 58 00                             | 92 00                    | Shut down—To be defueled.                                                                                                                                                                                                                                                                                                                                                                         |
| PNL Critical Mass Laboratory (DOE)                                                                       | FEAS                       | Hanford Site, WA                 | 1                  | 1                                 | PNL-CML         | 76 00                             | 90 00                    | The Critical Mass Laboratory was used to experiment<br>with liquid plutonium solutions. It was shut down<br>in 1990 and transferred to the surplus facilities<br>program for decontamination and decommissioning.<br>See FEAS reactor.                                                                                                                                                            |
| PNL Critical Mass Laboratory (DOE)                                                                       | Horizontal                 | Hanford Site, WA                 | 1                  | 1                                 | PNL-CML         | 61 00                             | 90 00                    | See FEAS reactor.                                                                                                                                                                                                                                                                                                                                                                                 |
| PNL Critical Mass Laboratory (DOE)                                                                       | RSTM                       | Hanford Site, WA                 | 1                  | 1                                 | PNL-CML         | 63 00                             | 90 00                    | See FEAS reactor.                                                                                                                                                                                                                                                                                                                                                                                 |
| United Nuclear Corporation, Development<br>Division (NRC) [50-290]                                       | PTF                        | Pawling, NY                      | 4                  | 3                                 | UNC             | 67 00                             | 72 00                    | Prof test facility. License 50-290 terminated 6/25/74.<br>Material license (SNM-871) terminated 7/14/75.                                                                                                                                                                                                                                                                                          |
| Zero Power Physics Reactor<br>Idaho Division (DOE)                                                       | ZPPR                       | INEL Site, ID                    | 1                  | 1                                 | ANL-IDAHO       | 69 00                             | 94 09                    | Basic fast reactor studies and mock-up for LMFBR.<br>Basic fast reactor studies and mock-up for LMFBR.                                                                                                                                                                                                                                                                                            |
| Zero Power Reactor No. 6 (DOE)                                                                           | ZPR-6                      | Argonne, IL                      | 2                  | 2                                 | ANL             | 63 00                             | 82 07                    | Zero-power experiments of historical interest previously<br>conducted in ANL facility cells include the<br>NAUTILUS core design (ZPR-1), the Savannah<br>River reactor design (ZPR-2), and a series of<br>fast-neutron studies (ZPR-4) and interactions<br>between two basic systems (ZPR-5). The following<br>experiments were performed in the ZPR-7<br>the Argonne High Flux Research Reactor. |
| Zero Power Reactor No. 9 (DOE)                                                                           | ZPR-9                      | Argonne, IL                      | 2                  | 2                                 | ANL             | 67 00                             | 82 00                    |                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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)                                                                     | FCPE                       | Schenectady, NY                  | 2                  | 1                                 | KAPL            | 70 00                             | 95 00                    | Full core physics experiment.                                                                                                                                                                                                                                                                                                                                                                     |
| 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.<br>License terminated 9/1/60.                                                                                                                                                                                                                                                                                                                 |
| Lockheed Aircraft Co., Critical Facility<br>for RER (NRC)                                                | CERF                       | Dawsonville, GA                  | 1                  | 1                                 | Lockheed        | 58 00                             | 60 09                    |                                                                                                                                                                                                                                                                                                                                                                                                   |
| Nuclear Safety Facility, Rocky Flats<br>Plant (DOE)                                                      | Vertical/<br>Split Table   | Golden, CO                       |                    |                                   | RFP-NSF         | 65 00                             | 92 00                    | Critical-configuration safety tests.                                                                                                                                                                                                                                                                                                                                                              |
| Nuclear Safety Facility, Rocky Flats<br>Plant (DOE)                                                      | Water<br>Reflector<br>Tank | Golden, CO                       |                    |                                   | RFP-NSF         | 65 00                             | 92 00                    | Critical-configuration safety tests.                                                                                                                                                                                                                                                                                                                                                              |

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