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Projected Spent Fuel Storage Requirements

March 1978

Pacific Northwest Laboratory
Richland, Washington 99352
Operated for the
U.S. Department of Energy
by

Battelle
Memorial Institute

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PROJECTED SPENT FUEL STORAGE REQUIREMENTS

by
A. J. Boegel
M. K. White
C. E. Willingham

March 1978

Pacific Northwest Laboratory
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INTRODUCTION

The amount of post reactor basin retrievable storage capacity required between now and 1990 for spent fuel depends largely on the actions taken by the nuclear industry before 1985. This date represents the earliest achievable availability of any such storage capacity other than additional water basins. The range of possible industry actions includes expansion of reactor or away from reactor (AFR) water basin capacity, discontinuing the practice of maintaining a full core reserve (FCR) in reactor basins, and shipping fuel within a utility from a reactor with a full basin to one with excess storage capacity.

Utilities are considering taking some or all of these actions between now and 1985 to avoid reactor shutdowns due to lack of spent fuel storage capability. This analysis identifies the post-reactor basin storage capacity requirements between now and 1990 for various combinations of these utility actions in order to establish the full range of possible storage requirements.

SUMMARY AND CONCLUSIONS

Some recent analyses performed by others (NRC, DOE, etc.)[1,2] have indicated that no spent fuel storage shortage will occur until after 1985. Those results are based on assumptions about the availability and usage of existing or planned storage basins belonging to General Electric, Allied General Nuclear Services, and Exxon. This analysis makes no speculation about the availability of such capacity, but instead identifies the requirements for spent fuel storage capacity which must be met by some combination of private capacity, spent fuel facility lag storage and ultimately, spent fuel storage facility capacity.

The combined actions of reracking reactor basins, transferring spent fuel within utilities, and relaxing the policy of reserving reactor basin capacity for a full core discharge are insufficient to meet pre-1985 spent

fuel storage capacity requirements. Additional storage capacity is required before 1985 for at least 1000 BWR assemblies and 2000 PWR assemblies. Storage capacity must be provided for a minimum of 12,000 BWR assemblies and 7,000 PWR assemblies by 1990. This is depicted as the minimum spent fuel storage requirement in Figure 1.

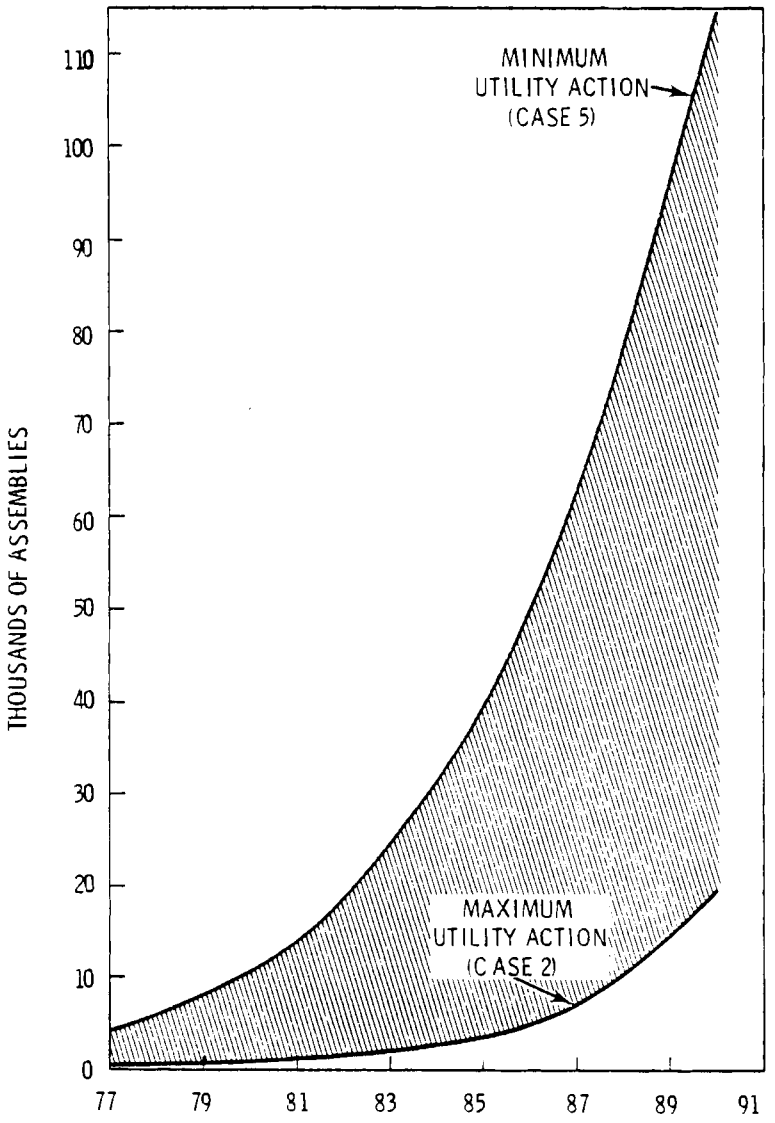


FIGURE 1. Range of Spent Fuel Storage Requirements

The maximum requirement for additional spent fuel storage capacity occurs if none of the possible industry actions are taken. That is, only those reactor basins for which permission has already been sought from NRC are reracked, full core discharge capability is maintained at every reactor, and no intra-utility fuel transfers are made. For this scenario, additional storage capacity is required for over 23,000 BWR and 17,000 PWR assemblies before 1985 and over 63,000 BWR and 40,000 PWR assemblies by 1990. This case is shown in Figure 1.

The amount of spent fuel which would be shipped to a post reactor basin storage facility between 1985 and 1990 depends on whether utilities continue the activities and policies required to meet spent fuel storage requirements before 1985 (no full core reserve, intra-utility fuel shipments) or seek to regain their pre-storage shortage posture (full core reserve capacity, no intra-utility fuel shipments). If utilities take the former approach, storage capacity is required between 1985 and 1990 for approximately 11,000 BWR assemblies and 5,000 PWR assemblies. If the latter philosophy prevails, storage capacity must be provided between 1895 and 1990 for approximately 27,000 BWR assemblies and 23,000 PWR assemblies.

DISCUSSION

The post-reactor basin storage requirements between now and 1990 were calculated for eight scenarios representing variations in reactor basin capacity, intra-utility fuel transfers, and full core reserve policy. These three parameters were varied as follows:

1) Reactor Basin Capacity

Two levels of reactor basin capacity were considered. The lower level assessed was the present capacity (or planned capacity for reactors yet to be built) augmented by expansion for which licensing requests have been made. The higher level considered assumed that all reactor basins for which no specific expansion plans were known will be expanded to hold three complete cores.

2) Full Core Reserve

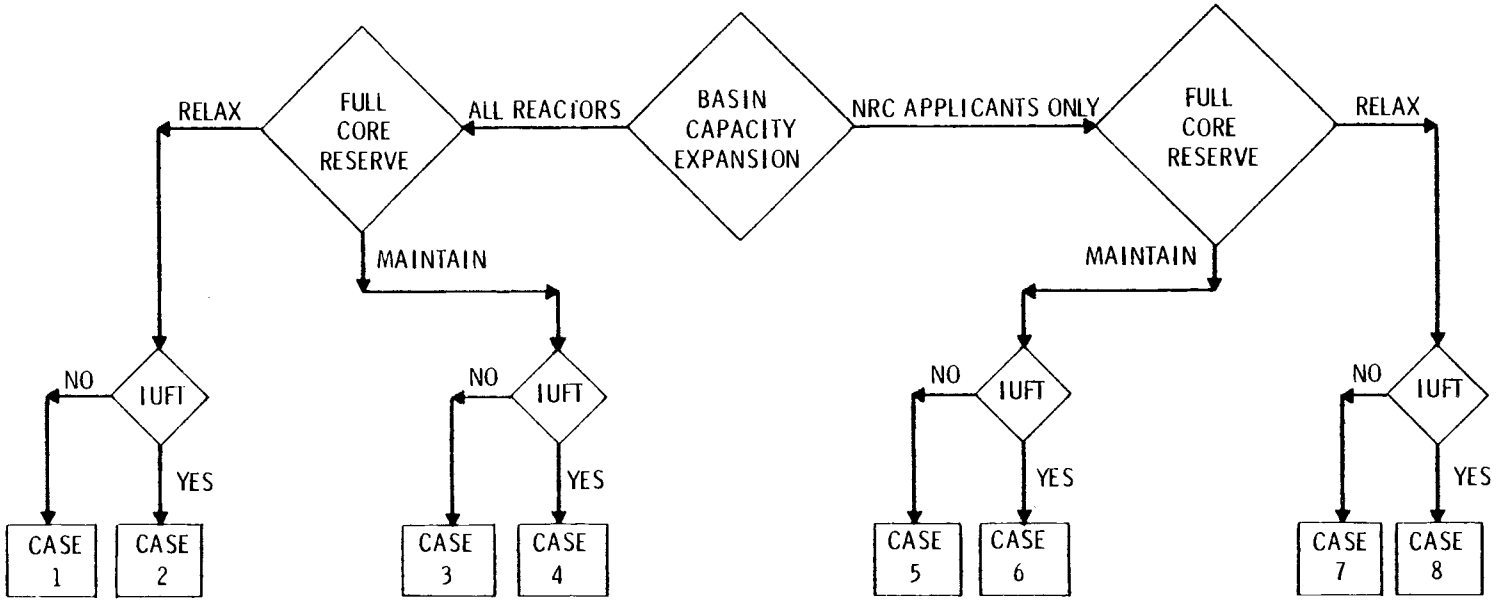
For the scenarios where full core reserve was assumed, each reactor maintained the capability to discharge an entire core at all times. For reactors sharing a basin, only one full core reserve was assumed in the basin. The cases which assumed no full core reserve projected shipment of fuel offsite only when the reactor basin was completely filled.

3) Intra-Utility Fuel Transfer (IUFT)

For the scenarios which assumed IUFT, it was assumed that spent fuel would be transferred from a full basin to another basin having excess storage capacity at a reactor of the same type (PWR/BWR) within the utility. Basins at new reactors were deemed able to receive transferred spent fuel the year they were projected to enter the utility grid.

Varying these three parameters in the manner shown in Figure 2 leads to the eight scenarios evaluated. Figure 2 also lists the major results for each case. Cases 1 through 8, given in Table 1, give the detailed results of these analyses. The annual incremental requirement for post reactor basin storage is shown, as well as the cumulative spent fuel storage capacity requirement. The 1985 cumulative capacity calculated for each case identifies the additional spent fuel storage capacity required prior to the achievable availability of any storage capacity other than water basins. The 1985-1990 total capacity requirement identifies potential utilization of a spent fuel storage facility available in 1985 resulting from the case assumptions.

The minimum spent fuel storage capacity requirement from 1985 to 1990 occurs when the actions which must be taken to meet storage requirements before 1985 are continued. This implies that all reactor basins have had their storage capacity increased to accommodate additional spent fuel inventories, that a full core discharge capability is not being maintained, that most operating reactors have full basins due to intra-utility fuel transfer, and some additional AFR storage is in use. The storage capacity increases required between 1985 and 1990 as a result of continuing these actions and policies are shown in Case 2. If utilities desire to discontinue interbasin shipments as soon as possible, the spent fuel storage facility



1985 STORAGE REQUIREMENTS (NUMBER OF ASSEMBLIES)

BWR	1235	1131	6238	6238	23289	18323	7866	4779
PWR	3615	2033	7715	4394	16990	13024	9457	4315
TOTAL	4850	3164	13953	10632	40279	31527	17323	9094

1990 STORAGE REQUIREMENTS (NUMBER OF ASSEMBLIES)

BWR	12880	12239	26956	24594	63816	53515	35408	18224
PWR	13072	7239	22988	19065	46542	37376	32281	20654
TOTAL	25952	19478	49944	43659	110358	90891	67689	38878

FIGURE 2. Scenario Logic Diagram

TABLE 1. Details of the Eight Scenarios Evaluated

CASE 1

a) Full Core Reserve Not Maintained
b) All Reactors Increase Basin Capacity
c) No Intra-Utility Fuel Transfer

AFR/STORAGE REQUIREMENTS (ASSEMBLIES)

		77	78	79	80	81	82	83	84	85	86	87	88	89	90
BWR	Annual	210	62	93	93	93	93	93	117	381	988	1433	1914	3557	3753
	Cumulative	210	272	365	458	551	644	737	854	1235	2223	3656	5570	9127	12880
PWR	Annual	38	90	82	203	280	331	603	987	1001	1355	1672	1982	2161	2287
	Cumulative	38	128	210	413	693	1024	1627	2614	3615	4970	6642	8624	10785	13072

BWR Storage Requirement (1986-1990) = 11645 Assemblies
PWR Storage Requirement (1986-1990) - 9457 Assemblies

CASE 2

a) Full Core Reserve Not Maintained
b) All Reactors Increase Basin Capacity
c) Fuel Transferred Within Utilities

AFR/STORAGE REQUIREMENTS (ASSEMBLIES)

		77	78	79	80	81	82	83	84	85	86	87	88	89	90
BWR	Annual	210	62	93	93	93	93	93	93	301	981	1351	1756	3275	3745
	Cumulative	210	272	365	458	551	644	737	830	1131	2112	3463	5219	8494	12239
PWR	Annual	38	90	82	110	124	196	493	500	400	644	502	592	1402	2066
	Cumulative	38	128	210	320	444	640	1133	1633	2033	2677	3179	3771	5173	7239

BWR Storage Requirement (1986-1990) = 11108 Assemblies
PWR Storage Requirement (1986-1990) = 5206 Assemblies

CASE 3

a) Full Core Reserve Maintained
b) All Reactors Increase Basin Capacity
c) No Intra-Utility Fuel Transfer

AFR/STORAGE REQUIREMENTS (ASSEMBLIES)

		77	78	79	80	81	82	83	84	85	86	87	88	89	90
BWR	Annual	416	93	282	301	373	731	830	1439	1723	2079	3419	4198	5414	5608
	Cumulative	416	509	791	1092	1465	2246	3076	4515	6238	8317	11736	15934	21348	26956
PWR	Annual	401	220	328	493	730	961	1223	1548	1811	2120	2401	2853	3567	4332
	Cumulative	401	621	949	1442	2172	3133	4356	5904	7715	9835	12236	15089	18656	22988

BWR Storage Requirement (1986-1990) = 20718 Assemblies
PWR Storage Requirement (1986-1990) - 15273 Assemblies

CASE 4

a) Full Core Reserve Maintained
b) All Reactors Increase Basin Capacity
c) Fuel Transferred Within Utilities

AFR/STORAGE REQUIREMENTS (ASSEMBLIES)

		77	78	79	80	81	82	83	84	85	86	87	88	89	90
BWR	Annual	416	93	93	93	153	765	1347	1555	1723	1811	3159	3289	4315	5783
	Cumulative	416	509	602	695	848	1613	2960	4515	6238	8049	11208	14497	18812	24595
PWR	Annual	195	246	203	381	456	479	586	804	1044	1451	2403	2686	3783	4348
	Cumulative	195	441	644	1025	1481	1960	2546	3350	4394	5845	8248	10934	14717	19065

BWR Storage Requirement (1986-1990) = 18357 Assemblies
PWR Storage Requirement (1986-1990) - 15273 Assemblies

TABLE 1. (cont'd)

CASE 5

a) Full Core Reserve Maintained
b) Basin Capacity Increases Limited to License Applicants Only
c) No Intra-Utility Fuel Transfer

AFR/STORAGE REQUIREMENTS (ASSEMBLIES)

		77	78	79	80	81	82	83	84	85	86	87	88	89	90
BWR	Annual	2975	1497	1420	1223	1480	2545	3263	3536	5350	7074	7585	8398	8883	8587
	Cumulative	2975	4472	5892	7115	8595	11140	14403	17939	23289	30363	37948	46346	55229	63816
PWR	Annual	1167	806	992	974	1437	1905	3069	3025	3615	4739	5132	6209	6617	6855
	Cumulative	1167	1973	2965	3939	5376	7281	10350	13375	16990	21729	26861	33070	39687	46542

BWR Storage Requirement (1986-1990) = 40527 Assemblies
PWR Storage Requirement (1986-1990) = 29552 Assemblies

CASE 6

a) Full Core Reserve Maintained
b) Basin Capacity Increases Limited to License Applicants Only
c) Fuel Transferred Within Utilities

AFR/STORAGE REQUIREMENTS (ASSEMBLIES)

		77	78	79	80	81	82	83	84	85	86	87	88	89	90
BWR	Annual	2164	1076	522	389	1542	2269	2203	3333	4825	5436	6959	7161	7758	7878
	Cumulative	2164	3240	3762	4151	5693	7962	10165	13498	18323	23759	30718	37879	45637	53515
PWR	Annual	671	462	547	794	1041	1268	1355	3020	3366	3814	4695	4184	5507	6152
	Cumulative	671	1133	1680	2474	3515	4783	6638	9658	13024	16838	21533	25717	31224	37376

BWR Storage Requirement (1986-1990) = 35192 Assemblies
PWR Storage Requirement (1986-1990) = 24352 Assemblies

CASE 7

a) Full Core Reserve Not Maintained
b) Basin Capacity Increases Limited to License Applicants Only
c) No Intra-Utility Fuel Transfer

AFR/STORAGE REQUIREMENTS (ASSEMBLIES)

		77	78	79	80	81	82	83	84	85	86	87	88	89	90
BWR	Annual	216	180	330	212	234	646	1713	1588	2697	3337	3906	5234	7286	7779
	Cumulative	216	396	726	938	1222	1868	3581	5169	7866	11203	15109	20343	27629	35408
PWR	Annual	144	220	418	355	842	987	1649	2371	2471	2923	3520	4639	5380	6362
	Cumulative	144	364	782	1137	1979	2966	4615	6986	9457	12380	15900	20539	25919	32281

BWR Storage Requirement (1986-1990) = 27542 Assemblies
PWR Storage Requirement (1986-1990) = 22824 Assemblies

CASE 8

a) Full Core Reserve Not Maintained
b) Basin Capacity Increases Limited to License Applicants Only
c) Fuel Transferred Within Utiltities

AFR/STORAGE REQUIREMENTS (ASSEMBLIES)

		77	78	79	80	81	82	83	84	85	86	87	88	89	90
BWR	Annual	246	180	318	169	157	372	1007	579	1751	1972	2377	2577	2835	3684
	Cumulative	246	426	744	913	1070	1442	2449	3028	4779	6751	9128	11705	14540	18224
PWR	Annual	38	22	139	136	197	623	825	925	1410	1886	3414	3514	3484	4041
	Cumulative	38	60	199	335	532	1155	1980	2905	4315	6201	9615	13129	16613	20654

BWR Storage Requirement (1986-1990) = 13445 Assemblies
PWR Storage Requirement (1986-1990) = 16339 Assemblies

capacity requirement is equal to the reactor discharge rate at the time the storage facility starts operation. If utilities further desire to reestablish FCR within 3 or 4 years, the required spent fuel facility storage capacity is doubled.

This process of progressing from the existing spent fuel situation to a more desirable situation may be viewed as a transition from Case 2 to Case 3. This is shown graphically for BWRs in Figure 3. The spent fuel storage facility receipt rate to effect this transition is approximately 5,400 BWR assemblies per year, or about 27,000 BWR assemblies from 1985-1990. The PWR spent fuel storage requirements are approximately 4600 assemblies per year, or 23,000 assemblies from 1985 to 1990.

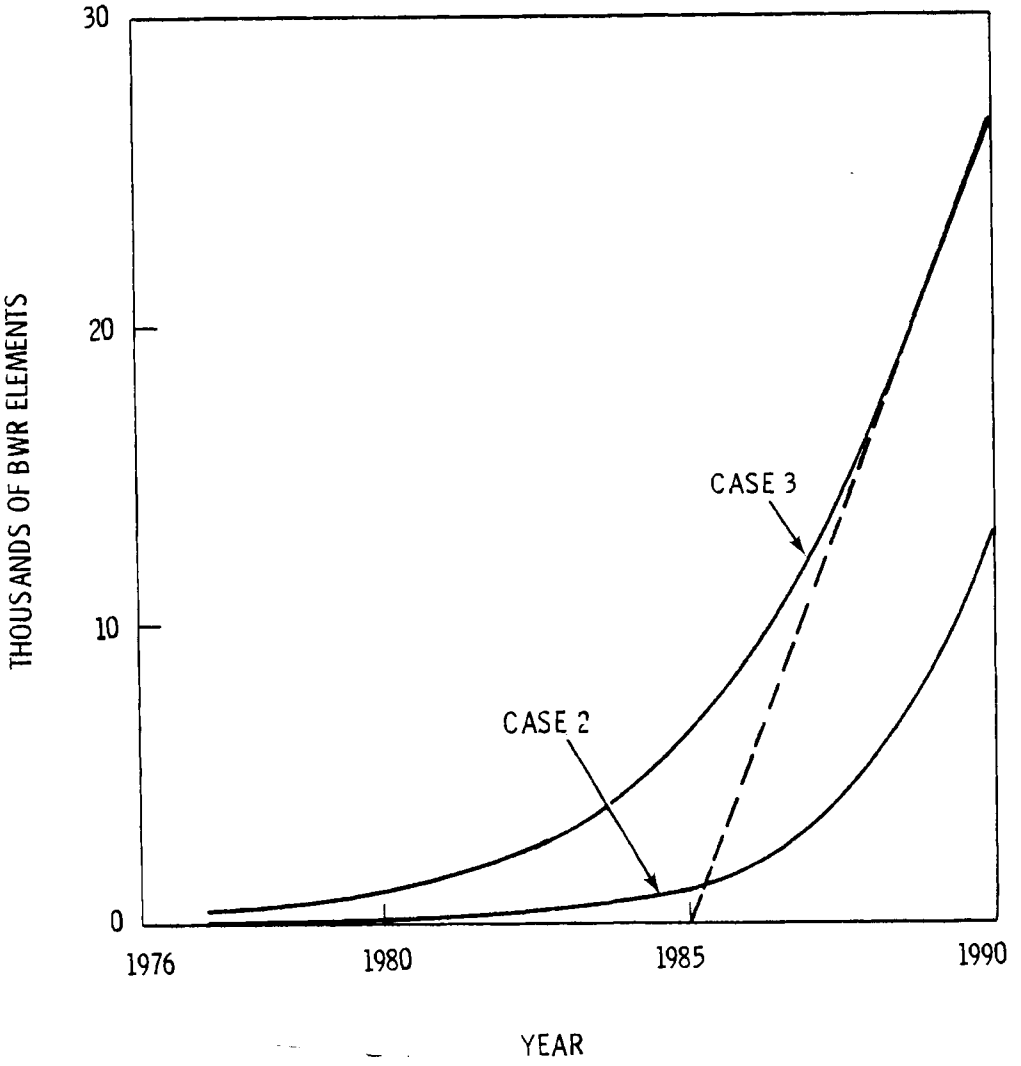


FIGURE 3. BWR Spent Fuel Storage Requirements

DATA BASE

The Appendix lists the reactors for which spent fuel storage requirements were assessed, their type (BWR/PWR), power generation capacity, and operating data. Data for reactor discharges, startup dates, basin capacities, and current basin inventories were obtained from Y/OWI/SUB-77/42500, prepared by Nuclear Assurance Corporation for the Office of Waste Isolation. This report includes reactors which will be operational by 1986. For reactors which were projected to become operational from 1986 through 1990, projected discharges were modeled on those in the OWI report of the same reactor size and design. For the cases that limited basin capacity increases to license applicants only, reactors for which no basin expansion license had been requested were assumed to have the basin capacities specified in their respective Safety Analysis Reports.

REFERENCES

1. LWR Spent Fuel Disposition Capabilities 1977-1986. ERDA 77-25, Energy Research and Development Administration, 1977 Edition, Available from NTIS.

2. Testimony of L. V. Gossick before the House Subcommittee on Oversight, Investigation of the Committee on Interstate and Foreign Commerce, August 1, 1977, 23(32):2, August 8, 1977.

3. U.S. LWR Spent Fuel Inventory and Projection, Y/OWI/SUB-77/42500, Nuclear Assurance Corporation, Atlanta, GA, June 1977.

APPENDIX

REACTOR DATA BASE

REACTOR DATA BASE

Reactor	Type	Generating Capacity (MWe)	Operating Date
Alabama Power Company			
Farley 1	PWR	861	1977
Farley 2	PWR	861	1979
Barton 2	BWR	1300	1986
Barton 2	BWR	1300	1987
Arizona Public Service Company			
Palo Verde 2	PWR	1237	1982
Palo Verde 2	PWR	1237	1984
Palo Verde 3	PWR	1237	1985
Arkansas Power and Light Company			
Arkansas 1*	PWR	886	Dec. 1974
Arkansas 2	PWR	960	1978
Baltimore Gas and Electric Company			
Calvert Cliffs 1	PWR	880	May 1975
Calvert Cliffs 2	PWR	880	1977
Boston Edison Company			
Pilgrim 1*	BWR	685	Dec. 1972
Pilgrim 2	PWR	1170	1984
Carolina Power and Light Company			
Robinson 2*	PWR	739	April 1971
Brunswick 2*	BWR	849	Dec. 1975
Brunswick 1*	BWR	849	1977
Harris 1	PWR	930	1983
Harris 2	PWR	930	1985
Harris 3	PWR	930	1989
Harris 4	PWR	930	1987
Cincinnati Gas and Electric Company			
Zimmer 1	BWR	840	1979
Zimmer 2	BWR	1172	1986
Cleveland Electric Illuminating Company			
Perry 1	BWR	1300	1981
Perry 2	BWR	1300	1983

*Applications to expand spent fuel storage capacity

Commonwealth Edison Company

Reactor	Type	Generating Capacity (MWe)	Operating Date
Dresden 1	BWR	215	Aug. 1960
Dresden 2*	BWR	834	Aug. 1972
Dresden 3*	BWR	832	Sept. 1971
Quad City 1*	BWR	832	Feb. 1973
Quad City 2*	BWR	832	Mar. 1973
Zion 1*	PWR	1085	Dec. 1973
Zion 2*	PWR	1085	Sept. 1974
LaSalle 1	BWR	1122	1979
LaSalle 2	BWR	1122	1980
Byron 1	PWR	1118	1980
Bryon 2	PWR	1118	1982
Braidwood 1	PWR	1118	1981
Braidwood 2	PWR	1118	1982
Carroll 1	PWR	1150	1986
Carroll 2	PWR	1150	1988
Connecticut Yankee Atomic Power Company			
Haddam Neck*	PWR	600	Jan. 1968
Consolidated Edison Company			
Indian Pt. 1	PWR	277	Oct. 1962
Indian Pt. 2*	PWR	906	Aug. 1973
Indian Pt. 3*	PWR	1005	1977
Consumers Power Company			
Big Rock Pt.	BWR	75	Nov. 1965
Palisades*	PWR	722	Apr. 1973
Midland 1	PWR	850	1981
Midland 2	PWR	850	1982
Detroit Edison Company			
Fermi 2	BWR	1150	1980
Greenwood 2	PWR	1300	1984
Greenwood 3	PWR	1300	1987
Duke Power Company			
Oconee 1	PWR	911	July 1973
Oconee 2	PWR	911	Sept 1974
Oconee 3*	PWR	911	Dec. 1974
McGuire 1	PWR	1180	1979
McGuire 2	PWR	1180	1980
Catawba 1	PWR	1150	1981
Catawba 2	PWR	1300	1985
Perkins 1	PWR	1300	1985
Perkins 2	PWR	1300	1987
Cherokee 1	PWR	1300	1984
Cherokee 2	PWR	1300	1989
Perkins 3	PWR	1300	1989
Cherokee 3	PWR	1300	1987

*Applications to expand spent fuel storage capacity

Duquesne Light Company

Reactor	Type	Generating Capacity (MWe)	Operating Date
Beaver Valley 1*	PWR	923	Sept. 1976
Beaver Valley 2	PWR	888	1982
Florida Power and Light Company			
Turkey Pt. 3*	PWR	728	Dec. 1972
Turkey Pt. 4*	PWR	728	Sept. 1973
St. Lucie 1	PWR	840	June 1976
St. Lucie 2	PWR	840	1981
Florida Power Corporation			
Crystal River 3	PWR	825	1977
Georgia Power Company			
Hatch 1	BWR	813	Jan. 1976
Hatch 2	BWR	813	1979
River Bend 1	BWR	980	1982
River Bend 2	BWR	980	1984
Blue Hills 1	PWR	980	1985
Blue Hills 2	PWR	980	1987
Houston Lighting and Power Company			
Allens Creek 1	BWR	1200	1985
Allens Creek 2	BWR	1200	1986
South Texas 1	PWR	1300	1980
South Texas 2	PWR	1300	1981
Illinois Power Company			
Clinton 1	BWR	980	1980
Clinton 2	BWR	980	1984
Indiana and Michigan Electric Company			
D. C. Cook 1	PWR	1090	Aug. 1975
D. C. Cook 2	PWR	1090	1978
Iowa Electric Light and Power Company			
D. Arnold 1*	BWR	565	Feb. 1975
Central Iowa	PWR	1200	1987
Jersey Central Power and Light Company			
Oyster Creek*	BWR	650	Dec. 1969
Forked River	PWR	1170	1983

*Applications to expand spent fuel storage capacity

Kansas Utilities

Reactor	Type	Generating Capacity (MWe)	Operating Date
Wolf Creek	PWR	1150	1983
Louisiana Power and Light Company			
Waterford 3	PWR	980	1981
Long Island Lighting Company			
Shoreham	BWR	849	1978
Jamesport 1	PWR	1150	1984
Jamesport 2	PWR	1150	1986
Maine Yankee Atomic Power Company			
Maine Yankee*	PWR	830	Dec. 1972
Metropolitan Edison Company			
Three Mile Is. 1	PWR	840	Sept. 1974
Three Mile Is. 2	PWR	1000	1978
Mississippi Power and Light Company			
Grand Gulf 1	BWR	1300	1981
Grand Gulf 2	BWR	1300	1984
Nebraska Public Power District			
Cooper	BWR	800	June 1974
Nebraska 1	PWR	1000	1984
Niagra Mohawk Power Company			
Nine Mile Pt. 1*	BWR	610	Dec. 1969
Nine Mile Pt. 2	BWR	1150	1982
Northern Indiana Public Service Company			
Bailly	BWR	685	1982
Northeast Nuclear Energy Company			
Millstone 1*	BWR	682	Jan. 1972
Millstone 2*	PWR	865	Dec. 1975
Millstone 3	PWR	1124	1982
Montague 1	BWR	1200	1987
Montague 2	BWR	1200	1989

*Applications to expand spent fuel storage capacity

Northern States Power Company

Reactor	Type	Generating Capacity (MWe)	Operating Date
Monticello	BWR	580	July 1971
Prairie Is. 1*	PWR	547	Dec. 1973
Prairie Is. 2*	PWR	547	Dec. 1974
Tyrone 1	PWR	1150	1984
Omaha Public Power District			
Fort Calhoun 1*	PWR	481	Sept. 1973
Fort Calhoun 2	PWR	1150	1983
Power Authority of the State of New York			
Fitzpatrick	BWR	821	July 1975
Pennsylvania Power and Light Company			
Susquehana 1	BWR	1100	1980
Susquehana 2	BWR	1100	1982
Pacific Gas and Electric Company			
Humbolt Bay	BWR	65	Aug. 1962
Diablo Canyon 1	PWR	1131	1977
Diablo Canyon 2	PWR	1131	1977
Stanislous 1	BWR	1200	1989
Stanislous 2	BWR	1200	1990
Philadelphia Electric Company			
Peach Bottom 2	BWR	1098	May 1974
Peach Bottom 3	BWR	1098	Dec. 1974
Limerick 1	BWR	1100	1983
Limerick 2	BWR	1100	1985
Portland General Electric			
Trojan*	PWR	1216	May 1976
Pebble Springs 1	PWR	1300	1985
Pebble Springs 2	PWR	1200	1987
Public Service Company of Indiana			
Marble Hill 1	PWR	1150	1981
Marble Hill 2	PWR	1150	1983
Public Service Company of Okalahoma			
Black Fox 1	BWR	980	1983
Black Fox 2	BWR	980	1985

*Applications to expand spent fuel storage capacity

Public Service Electric and Gas Company of New Jersey

Reactor	Type	Generating Capacity (MWe)	Operating Date
Salem 1*	PWR	1170	June 1977
Salem 2	PWR	1170	1979
Hope Creek 1	BWR	1140	1984
Atlantic 1	PWR	1150	1984
Hope Creek 2	BWR	1150	1985
Atlantic 2	PWR	1150	1985
Public Service Company of New Hampshire			
Seabrook 1	PWR	1150	1982
Seabrook 2	PWR	1150	1984
Puget Sound Power and Light Company			
Skagit 1	BWR	1300	1984
Rochester Gas and Electric Company			
R. E. Ginna*	PWR	490	Mar. 1970
Sterling 1	PWR	1150	1984
South Carolina Electric and Gas Company			
V. Summer 1	PWR	950	1980
Southern California Edison Company			
San Onofre 1	PWR	456	Jan. 1968
San Onofre 2	PWR	1170	1981
San Onofre 3	PWR	1170	1983
Sacramento Municpal Utility District			
Rancho Seco 1*	PWR	964	Apr. 1975
Rancho Seco 2	PWR	963	1987
San Diego Gas and Electric Company			
Sun Desert 1	PWR	790	1985
Sun Desert 2	PWR	790	1988
Texas Utilities			
Commanche Peak 1	PWR	1150	1980
Commanche Peak 2	PWR	1150	1982
Toledo Edison Company			
Davis Besse 1	PWR	950	June 1977
Davis Besse 2	PWR	950	1985
Davis Besse 3	PWR	950	1986

*Applications to expand spent fuel storage capacity

Tennessee Valley Authority

Reactor	Type	Generating Capacity (MWe)	Operating Date
Brown's Ferry 1	BWR	1098	Aug. 1974
Brown's Ferry 2	BWR	1098	Mar. 1975
Brown's Ferry 3	BWR	1098	1977
Sequoyah 1	PWR	1170	1978
Sequoyah 2	PWR	1170	1979
Watts Bar 1	PWR	1218	1979
Watts Bar 2	PWR	1218	1980
Bellefonte 1	PWR	1300	1980
Bellefonte 2	PWR	1218	1981
Hartsville A-1	BWR	1300	1983
Hartsville A-2	BWR	1300	1984
Hartsville B-1	BWR	1300	1983
Hartsville B-2	BWR	1300	1984
Yellow Creek 1	PWR	1300	1985
Yellow Creek 2	PWR	1300	1988
Union Electric Company of St. Louis			
Callaway 1	PWR	1150	1982
Callaway 2	PWR	1150	1984
Virginia Electric and Power Company			
Surry 1*	PWR	824	Dec. 1972
Surry 2*	PWR	824	May 1973
North Anna 1	PWR	947	Apr. 1977
North Anna 2	PWR	892	1978
Surry 3	PWR	915	1987
Surry 4	PWR	915	1988
North Anna 3	PWR	915	1981
North Anna 4	PWR	915	1981
Vermont Yankee Nuclear Power Corporation			
Vermont Yankee*	BWR	540	Nov. 1972
Washington Public Power Supply System			
WPPSS 2	BWR	1150	1980
WPPSS 1	PWR	1300	1982
WPPSS 3	PWR	1240	1983
WPPSS 4	PWR	1300	1983
WPPSS 5	PWR	1240	1985
Wisconsin Electric Power Company			
Point Beach 1*	PWR	524	Dec. 1970
Point Beach 2*	PWR	524	Oct. 1972
Koshkonong 1	PWR	930	1986
Koshkonong 2	PWR	930	1989

*Applications to expand spent fuel storage capacity

Wisconsin Public Service Company

Reactor	Type	Generating Capacity (MWe)	Operating Date
Kewaunee	PWR	560	June 1974
Yankee Atomic Electric Company			
Yankee Rowe*	PWR	185	June 1961
New York State Electric and Gas Company			
Somerset 1	BWR	1300	1984
Somerset 2	BWR	1300	1985
Central Main Power Company			
Sears Island	PWR	1124	1985
Dairyland Power Company			
La Crosse*	BWR	55	Nov. 1969
Ohio Edison Company			
Erie 1	BWR	1260	1985
Erie 2	BWR	1260	1987

*Applications to expand spent fuel storage capacity

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