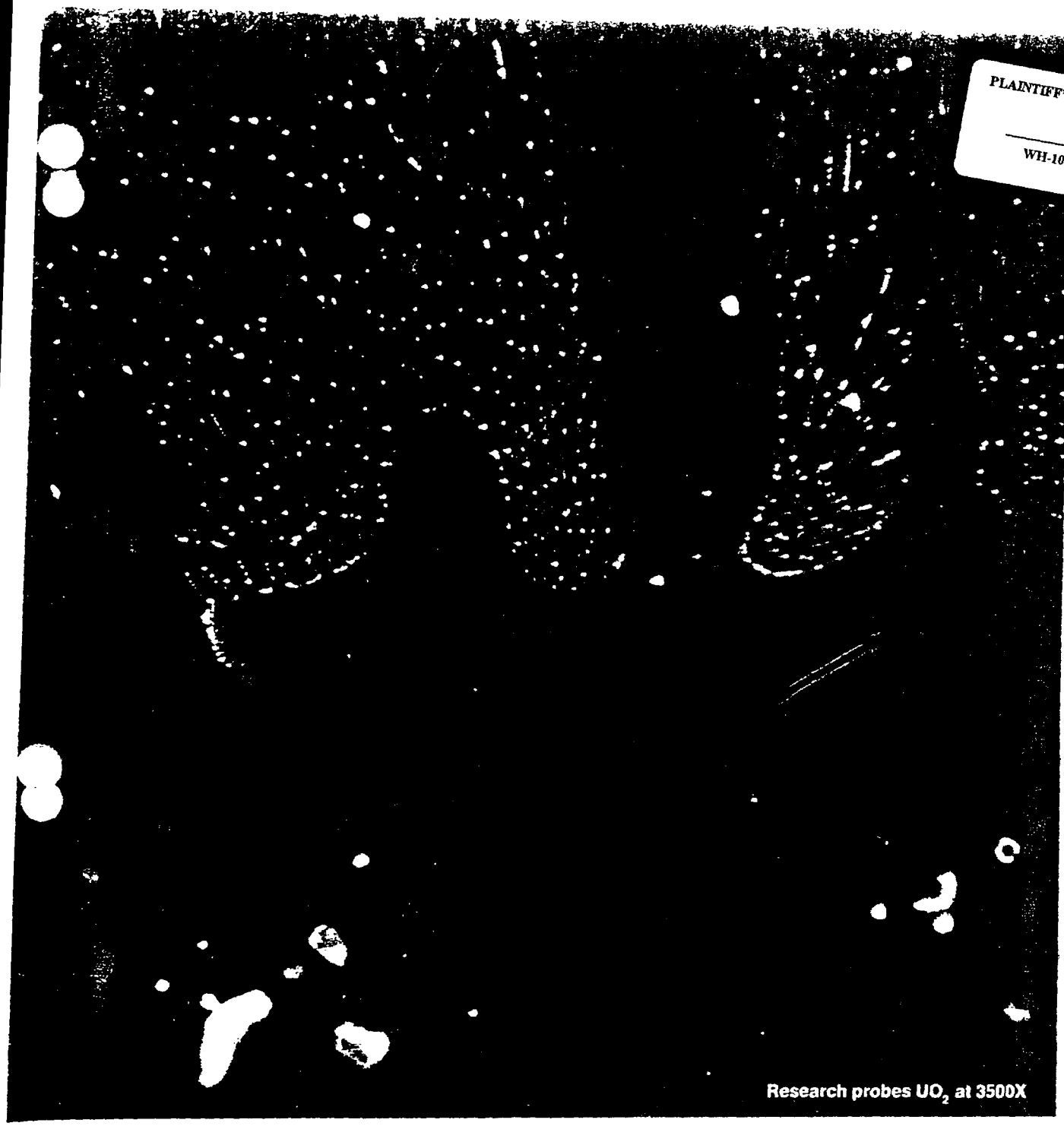


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NERGY SYSTEMS DESIGN ISSUE

- ch and development, a 24 page staff report
- ent and literature roundup
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This exclusive report gives design data from over 1200 projects and analyzes trends affecting utilities, strial plants, mmercial buildings and institutions

1 Fossil-fueled central stations ..... S·2

2 Nuclear-powered central stations ..... S·8

3 Oil and gas engines ..... S·12

4 Steam systems ..... S·20

5 Steam turbine mechanical drives ..... S·28

6 Steam turbine in-plant electric generation .... S·30

7 Air conditioning ..... S·31

8 Electric distribution ... S·40

Power

October 1968

1 FOSSIL-FUELED CENTRAL STATIONS

Outdoor boilers are in majorit

Each project listing covers 4 pages

PROJECT	COMPANY	PLANT NAME	LOCATION	CONSULTING ENGINEER	Unit No., new unit	Date first operation	Unit capacity, MW	BOILE Capacity ea, 1000 lb per hr	Throttle pressure, psig	Throttle
1	Tennessee Valley Authority	Cumberland	Cumberland City, Tenn		1,2[3]	72,73	1300	9300	3500	
2	Houston Lighting and Power Co	Cedar Bayou	Eldon, Texas	Ebasco Services Inc	2	11-71	775	5200	3500	
3	Texas Power & Light Co	Tradinghouse Creek	Waco, Texas	Brown & Root, Inc	2	12-71	775	5456	3675	
4	Appalachian Power Co	Mitchell	Moundsville, W Va	American Electric Power Service Corp	1	1970	760	5280	3500	
5	Appalachian Power Co	Mitchell	Moundsville, W Va	American Electric Power Service Corp	2	1971	760	5280	3500	
6	Southern California Edison Co	Mohave	Clark County, Nev	Bechtel Corp	1,2[3]	70,71	755	5450	3500	
7	Louisiana Power & Light Co	Ninemile Point[4]	Westwego, La	Ebasco Services Inc	4	1-71	750	5400	3675	
8	Pennsylvania Power & Light Co	Montour	Washingtonville, Pa	Ebasco Services Inc	1	9-71	730	5700	3675	
9	Pacific P & L Co and Washington Water Power Co	Centralia	Centralia, Wash	Bechtel Corp	1	9-71	725	4907	2400	
10	Georgia Power Co	Etowan	Stillesboro, Ga	Southern Services, Inc	1	4-71	700	5035	3500	
11	Ohio Edison Co	W H Sammis	Stratton, Ohio	Commonwealth Associates Inc	6	10-68	623	4628	3785	
12	Cincinnati Gas & Electric Co[5]	J M Stuart	Aberdeen, Ohio	Ebasco Services Inc	1,2,3[3]	71,70[28]	604	4374	3500	
13	New England Electric System	Brayton Point	Somerset, Mass	Stone & Webster Engrg Corp	3	4-69	578	4050	3675	
14	Potomac Electric Power Co	Morgantown	Morgantown, Md	Bechtel Corp	2	4-71	575	4250	3675	
15	Potomac Electric Power Co	Morgantown	Morgantown, Md	Bechtel Corp	1	4-70	573	4250	3675	
16	Dallas Power & Light Co[7]	Big Brown	Freestone County, Texas	Ebasco Services Inc	1,2[3]	71,72	543	4025	3825	
17	Louisiana Power & Light Co	Little Gypsy	Laplace, La	Ebasco Services Inc	3	1-68	531	3980	3500	
18	Kansas City Power & Light Co	Hawthorn	Kansas City, Mo	Ebasco Services Inc	5	4-69	513	3500	2525	
19	Oklahoma Gas & Electric Co	Seminole	Konawa, Okla	Brown & Root, Inc	1	2-71	510	3590	2400	
20	Oklahoma Gas & Electric Co	Seminole	Konawa, Okla	Brown & Root, Inc	2	2-73	505	3590	2400	
21	Detroit Edison Co	Saint Clair	Saint Clair, Mich		7	12-68	500	3580	2520	
22	Tampa Electric Co	Big Bend	Tampa, Fla	Stone & Webster Engrg Corp	2	4-72	450	2856	2400	
23	Florida Power & Light Co	Fort Myers	Tice, Fla	Bechtel Corp	2	9-69	432	2640	2400	
24	Indianapolis Power & Light Co	Petersburg	Petersburg, Ind	Stone & Webster Engrg Corp	2	5-69	421	2640	2400	
25	Long Island Lighting Co	Northport	Northport, NY	Ebasco Services Inc	2	5-68	380	2550	2520	
26	Texas Power & Light Co	Valley	Savoy, Texas	Brown & Root, Inc	3	12-70	375	2595	1890	
27	Pacific Power & Light Co	Dave Johnston	Glenrock, Wyo	Ebasco Services Inc	4	5-72	360	2450	1800	
28	Utah Power & Light Co	Naughton	Kemmerer, Wyo	Stearns-Roger Corp	3	8-71	330	2520	2400	
29	Central Louisiana Electric Co Inc	Teche	Baldwin, La	Sargent & Lundy	3	1-71	320	2500	2400	
30	Louisville Gas and Electric Co	Cane Run	Louisville, Ky	Pioneer Service & Engrg Co	6	5-69	268	1853	2400	
31	Southwestern Public Service Co	Clifford B Jones	Lubbock, Texas		1	7-71	232	1783	2150	
32	Savannah Electric & Power Co	Port Wentworth	Port Wentworth, Ga	Stone & Webster Engrg Corp	4	3-71	116	875	1800	
33	Northern Indiana Public Service Co	Mitchell	Gary, Ind	Sargent & Lundy	11	10-70	115	821	1800	
34	Puerto Rico Water Resources Authority	San Juan	San Juan, P R	Jackson & Moreland Div, United Eng. & Const, Inc	7,8[33]	1966	114	787	1800	
35	Sierra Pacific Power Co	Fort Churchill	Reno, Nev	Stone & Webster Engrg Corp	2	5-71	105	770	1890	
36	West Texas Utilities Co	Paint Creek	Haskell, Texas	Sargent & Lundy	4	4-71	105	765	1875	
37	Pacific Gas and Electric Co	Geysers	Sonoma County, Calif		5	6-71	55	907[40]	100	
38	Black Hills Power & Light Co	Wyodak	Wyodak, Wyo	Stearns-Roger Corp	5	9-69	20	220	850	
39	Pacific Power & Light Co	Trona	Green River, Wyo	Bechtel Corp	1	8-68	15 6	200[41]	600	

MUNICIPAL AND COOPERATIVE INSTALLATIONS

40	City of Austin	Decker Creek	Austin, Texas	Brown & Root, Inc	2	5-70	321	2250	2000	
41	Lower Colorado River Authority	Sim Gideon	Bastrop, Texas	Brown & Root, Inc	3	5-72	315	2280	2050	
42	Associated Electric Cooperative	Thomas Hill	Thomas Hill, Mo	Burns & McDonnell	2	4-69	270	2100	2520	
43	Minnkota Power Cooperative	Central	Center, ND	Sanderson & Porter, Inc	1	1970	227	1650	1800	
44	Omaha Public Power District	North Omaha	Omaha, Neb	Gibbs, Hill, Durham & Richardson, Inc	5	5-68	200	1600	2520	
45	Big Rivers Rural Electric Cooperative Corp	Kenneth C Coleman	Hawesville, Ky	Parsons-Jurden Corp	1,2[3]	69,70	353	1160	1800	
46	City of Springfield	James River	Springfield, Mo	Burns & McDonnell	5	1-70	105	725	1800	
47	Lansing Board of Water and Light	O E Eckert	Lansing, Mich		6	1970	60	675	1250	
48	Brazos Electric Power Cooperative	R W Miller	Lake Palo Pinto, Texas	Tippett & Gee	1	3-68	38 7	756	1250	
49	Columbia Water and Light Department	Municipal	Columbia, Mo	Black & Veatch	8	4-70	34	342	900	
50	City of Houma	Municipal	Houma, La	Barnard and Burk, Inc	14	6-67	14 4	140	630	

SYMBOLS

Ad - Anthracite
Adl - Anthracite bu
AtB - Anthracite bu
AsCo - Anthracite
Art - Bituminous
B - Bituminous
Bal - Bituminous
C - Coal, bituminous
CC - Coke
CAN - Coke
D - Distillate
DB - Distillate
De - Distillate
E - Excess air
Ex - Excess air
Exap - Excess air
FR - Fuel oil
G - Gas
GR - Fuel gas
H - Hydrogen
HC - Hydrocarbon
Sk - Shale oil
L - Liquid

new units will generate supercritical steam

BOILER						FURNACE					F.D FANS						I.D FANS						
CE, 1000 SQ FT															DRIVE						DRIVE		
Reheater	Economizer	Air heater	Superheat control	Reheat control	Pressure, in water	Volume, 1000 cu ft	Heat release, 1000 Btu per cu ft per hr	No. of burners	Type	Per boiler	Capacity ea, 1000 cu ft min	Manufacturer	Flow control	Hp	Manufacturer	Per boiler	Capacity ea, 1000 cu ft min	Manufacturer	Flow control	Hp	Manufacturer	PROJECT
215.6	405.4	1209.6	Att,FR	Att,GR	18.2	956		44	Pd,ST	2	1130		S[17]	8000	BB	N	N	N	N	N	N	1
70.16	161.5	350.6	FR	EA	23.6	236.5	30.2	24	Pd,DB	2	642.4	APC	V	6000	WE	N	N	N	N	N	N	2
65.8	133	327	WS	WS	26	222.5	30.7	24	Pd	2	672		S	10,400	DL[31]	N	N	N	N	N	N	3
151.1674	252	644	Att,FR	Att,PD	23	477	14.4	36	Pd,DB	2	1000	SW	D	7000	GE	N	N	N	N	N	N	4
151.1674	252	644	Att,FR	Att,PD	23	477	14.4	36	Pd,DB	2	1000	SW	D	7000	GE	N	N	N	N	N	N	5
110	220	1245	WS,FR	TB,WS	36	416		80	Pd,DB	2	1180		V,D	7000		N	N	N	N	N	N	6
72	329	443.6	FR	EA	25	230	30.95	20	Pd	2	748					N	N	N	N	N	N	7
174.4	345.3	450.6	WS	WS,TB	15.95	463	14.7	48	Pd	2	902	SW	V	5500	GE	N	N	N	N	N	N	8
53	94	469	WS	TB	-0.1	577	10.3	8	Bal,DB	2	446.5	SW	V	2250	GE	2	1055	HOW	D	4500	GE	9
146	270	707	WS,TB	WS,TB	24	366	15	48	Pd	2	946	SW	V	7000		N	N	N	N	N	N	10
152.8	219.9	746.4	Att	Att,GR	18.2	366	15.54	24	Pd,DB	2	800	AS	V	5500	GE	N	N	N	N	N	N	11
121	367	722.5	Att	GR	18	390	14	24[16]	Pd,DB	2	840	SW	V	6650	WE	N	N	N	N	N	N	12
190	220	594	WS	WS,GR	.	357	15	20	Pd,DB	2	657	SW	V	3500	WE	N	N	N	N	N	N	13
121	275	1212.4	FR	TB	-0.1	288.8	18.1	40	Bal,DB	2	666	.	V	2000	EM	2	925.8	. . .	HC	4500	EM	14
121	275	1212.4	FR	TB	-0.1	288.8	18.1	40	Bal,DB	2	666	. . .	V	2000	EM	2	925.8	. . .	HC	4500	EM	15
115	65	342	WS	TB,WS[32]	-0.1	512	. . .	64	Bal,DB	2	455	SW	V	1250	AC	2	1241	APC	V	4000	AC	16
84.5	45	569.6	WS,FP	WS,D	20	290	25.9	24	Pd	2	301	AS	V	2500	WE	N	N	N	N	N	N	17
53.6	156	786.6	WS	TB	16.25	347	15.4	24,40[23]	Pd	2	642	AS	D	4000	WE	N	N	N	N	N	N	18
41	103	402	WS,Att	WS,EA	30	134	38.3	12	Pd	2	564	APC	V	4000	GE	N	N	N	N	N	N	19
41	103	402	WS,Att	WS,EA	30	134	38.3	12	Pd	2	584	APC	V	4000	GE	N	N	N	N	N	N	20
52.7	171	790.8	WS	TB	-0.1	270.4	17.2	48	Bal,DB	2	471	WE	V	1750	WE	2	697	WE	V	3500	WE	21
131.5	56	320.7	WS,D	WS,D	23	222	. .	24	Pd,ST	2	512	AS	V	3500	EM	N	N	N	N	N	N	22
84.5	86.5	309	WS,D	WS,D	26	184	20.8	18	Pd	2	491	BF	HyC	3500	EA	N	N	N	N	N	N	23
37.8	115	368.2	WS,TB	WS,TB	13.5	310	15.5	20	Pd,DB	2	588	WE	D	3000	WE	N	N	N	N	N	N	24
94	95	295	WS,TB	GR,TB	32	230	14.9	16	Pd,DB	2	467	AS	V,D	2500	EM	N	N	N	N	N	N	25
16.3	176.8	N	Att	Att	20	95.3	. . . .	16	Pd	1	826.2	APC	V	5000	AC	N	N	N	N	N	N	26
34	77	419	WS	WS,TB	-0.15	280	12.35	28	Bal,DB	2[30]	359	.	V	900	GE	2	793	. . .	V	4000	GE	27
27	81.5	274	WS,TB	WS,TB	0	235	13	20	Bal,WB	2	. . .	. . . .	. . . .	. . . .	. . . .	2	. .	. . .	. . . .	. . .	. .	28
. . . .	. . .	. .	Att,EA	Att,EA	. . .	. . .	. .	18	Pd	2	. . .	. . . .	. . . .	. . . .	. . . .	N	N	N	N	N	N	29
22.6	59	235.2	WS	TB	0	146.8	17.1	20	Bal,DB	2	347	SW	V	1250	GE	2	538	SW	HyC	2000	GE	30
14.8	103.5	276.2	WS,TB	TB,WS[32]	19	97.4	23.1	32	Pd	2	304	. . .	V,D	1750	GE	N	N	N	N	N	N	31
6.24	41.5	87.6	TB	TB	13.35	34.77	34.9	16	Pd	2	146.5	WE	V	900	GE	N	N	N	N	N	N	32
18.2	9.5	132.2	Att,GR	Att	-0.1	76.13	14.2	12	Bal,DB	2	203	AS	V	700	AC	2	228	AS	HyC	900	AC	33
9.86	12.9	219.2	Att	GR	12	42.52	24.4	16	Pd	2	140	SW	V	700	WE	1	130	GF	D	300	WE	34
7.9	15.9	79.2	EA,Att[38]	EA,Att[38]	8.9	42.44	26	8	Pd	1	310	WE	V	1500	. . . .	N	N	N	N	N	N	35
7.2	28.9	166.5	Att	Att	. . . .	28.8	35.2	6	Pd,DB	1	291	. . .	D	. . .	. .	N	N	N	N	N	N	36
N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	37
N	N	47	WS	N	.	16.15	18.1	4	Pd	1	61.9	SW	V	300	AC	N	N	N	N	N	N	38
N	N		WS	N	. .	1.5	. .	1	Pd,DB	1	90.5	CF	V	1000	WE	N	N	N	N	N	N	39
26	120	522	WS,TB	WS,TB	17	147	30	16	Pd	2	405	APC	V	2750	WE	N	N	N	N	N	N	40
23	144	424	WS,TB	WS,TB	19.15	147	30	16	Pd	2	. .	APC	HyC		WE	N	N	N	N	N	N	41
36	38	468	Att,GR	Att,GR	16	122	29.3	6	Pd,ST	2	344	WE	V	5000	AC	N	N	N	N	N	N	42
. . .	. . .	. . .	WS	GR	. . .	. . .	. . .	7	Bal,ST	2	354	CF	V	3500	WE	2	689	GF	D	3500	WE	43
51.5	44.7	274.4	WS,D	D	12.9	126	16.6	12	Pd,DB	2	294	AS	V	1750	GE	N	N	N	N	N	N	44
36.1	21.7	121	Att	D	.	99.2	. . .	6	Pd,DB	2	219	AS	V	1200	GE	N	N	N	N	N	N	45
25.6	9.6	82.7	WS	D	-0.1	55.6	18.1	6	Bal,DB	2	167	SW	V	600	WE	2	251	SW	D	1000	WE	46
N	4.92	358.4	Att	N	-0.1	46.6	17.4	9	Bal,DB	2	105	. . .	V	200	. .	2	135.8		D	300	.	47
N	N	202.2	Att	N	17	23.9	39.1	8	Pd	2	.	APC	V	500	WE	N	N	N	N	N	N	48
N	N	221.4	WS	N	21.6	11.05	40.4	4	Pd	1	91.4	CF	V	2x250	GE	N	N	N	N	N	N	49
N	N	36.2	WS	N	8	4.35	38.7	3	Pd	1	41.2	BF	S,V	150,75	GE	N	N	N	N	N	N	50

V — Vane control
WE — Wall-opposed furnace
WC — Wall-fired steam

FOOTNOTES

- Outdoor
- Electric
- Data given is for 1 unit
- Identical pulverizers, respectively
- Pressure and temperature, respectively
- Pulverizers & auxiliary units
- Forced draft fans & auxiliary units
- Induced draft fans & auxiliary units
- Each unit has 2 forced draft fans and 2 induced draft fans
- Induced draft fans
- Induced draft fans
-

Tandem-compound turbines predominate in sizes

PROJECT	BOILER FEED PUMPS						DRIVE		FUEL			FIRING		SOOT		DUST			HEATERS			
	Number per unit	Capacity ea, gpm	Discharge, psig	Manufacturer	Flow control	Drive type	Hp each motor or turbine	Manufacturer	Type	1000 Btu per lb	Net unit heat rate, Btu/kWh	Pulverizers per boiler	Manufacturer	Blower type and medium	Manufacturer	Collector type	Manufacturer	Stack height, ft	Number	Feedwater exit, F	Max deaerating pressure, psia	
1	2	10,700	4575	...	S	T	34,000	BB	C	11.2	8872	11	BW	Air,Ret	DP	El	...	1000	16[10]	550	109	SWE
2	2	5220	4620	DL	S	T	18 050	DL	G	1018[2]	7828	N	N	N	N	N	N	215	7	493	160	FW,BW
3	1	13,750	.....	DL	S	T	38,200	DL[8]	G	1028[2]	....	N	N	N	N	N	N	198	7	488	147	YU
4	1	12,550	4570	IR	S	T	34,800	WE	C	12	9660	6	FW	St,Ret	DP	El	RC	1200[9]	7	550	98	WO
5	1	12,550	4570	IR	S	T	34,800	GE	C	12	8660	6	FW	St,Ret	DP	El	RC	1200[9]	8	548	103	WO
6	2	6220	4130	....	S	2T	19 000	...	C	11	9100	10	CE	Air,Ret	DP	El	...	500	6	500	101	COC
7	2	6560	4420	....	S	T	18,400	WE	G,D[11]	1063[2]	...	N	N	N	N	N	N	126	7	512	....	...
8	2	7267	4420	WO	S	T	20,320	DL	C	12.26	7890	6	CE	St,Ret	CV	El	....	600	10	554	80 5	FW
9	2	6730	2950	PP	S	T	15 000	...	C	8.1	....	8	CE	St,Ro,Ret	DP	El	....	...	7	504	59	WE
10	2	9650	4650	BJ	S	T	21,550	WE	C	12	....	6	CE	Ro,Ret	CV	El	RC	1000	9	500	148.6	GW
11	2	5880	4560	PP	S	T	17,600	WE	C	12.18	...	6	BW	Air,Ret	DP	El	WP	850	8	543	159	WO,CHH
12	2	5500	4510	WO	S	2T	18 000	GE	C	11	8898	6	BW	Air,Ret	DP	El	BU	800	8	553	63.3	FW,STV
13	1	9250	4600	IR	S	T	30,300	WE	C	11.5	...	5	BW	Air,Ret	DP	El	KC	350	8	560	110	BLH,FW
14	2	5000	4472	...	S	T	....	GE	O,C	12.8,18.5[12]	8600	5	CE	St,Ro,Ret	CV	El	RC	700	7	507	82.2	WE
15	2	4880	4485	....	S	T	....	WE	O,C	12.3,18.5[12]	8600	5	CE	St,Ro,Ret	CV	El	RC	700	7	508	65.5	WE
16	1	9700	4375	DL	S	T	31,500	DL	L	7.59	9710	3	CE	Air,Ret	CV	El	RC	400	7	501	....	FW,YU
17	2	4960	4500	WO	S	T	13,700	GE	G	1033[2]	N	N	N	N	N	N	N	....	7	500	....	WE
18	1	8700	3000	PP	S	T	16,000	GE	C,G	11.3,9742	....	6	CE	St,Ret	CV	El	BU	600	7	483	....	YU
19	2	4306	3038	BJ	S	T	8380	GE	G	9752	....	N	N	N	N	N	N	280	6	480	124	WE
20	2	4306	3038	BJ	S	T	8380	WE	G	9752	....	N	N	N	N	N	N	280	6	476	171	WE
21	1	9300	3017	IR	S	T[25]	16,390	WE	C	11.5	....	6	CE	Air,Ro,Ret	CV	El	AS	600	7	485	....	WE
22	1	...	3400	PP	S	T	14 500	WE	C	11.13	....	3	RS	St,Ret	....	El	WP	499	7	494	....	BLH
23	2	3350	3035	BJ	HyC	M	3500	LA	O	18.25	....	N	N	St,Ret	DP	Me	AT	400	7	471	...	YU
24	2	4185	3000	OL	HyC[27],RC	MTS M	4000	AC	C	10.4	8433	5	CE	St,Ro,Ret	DP	Me,El	RC	551	7	478	....	SWE
25	1	6290	2815	IR	HyC	MTS	12,090	....	O	18.3	....	N	N	Air,Ro,Ret	CV	Me	AT	600	7	467	....	WE
26	1	6200	2260	IR	S	T	10,400	GE	G	1050[2]	...	N	N	N	N	N	N	160	3	325	...	SWE
27	2	3075	2445	OL	RC	M	5000	GE	L	6 8	10,500	7	CE	Air,Ret	....	...	.....	315	6	465	170	COC
28	2	3030	3290	BJ	S	T	7050	WE	C	9.5	9950	5	CE	St,Ro,Ret	CV	El	.....	250	5	476	375	WE
29	....	...	...	....	....	...	11,900	....	G	1060[2]	....	N	N	N	N	N	N	...	6	....	....	...
30	2	2350	3235	AC	HyC	M	5500	GE	C	11.6	9175	5	CE	St,Ret	CV	El	BU	500	6	485	130	BLH,CHH
31	2	3090	2083	WO	HyC	M	4500	GE	G	1000[2]	9945	N	N	N	N	N	N	70	5	473	103	YU
32	2	1065	2750	BJ	RC	M	1750	GE	G	1039[2]	9843	N	N	St,Ret	DP	....	.....	198	5	468	65	YU
33	2	1013	2232	IR	HyC,RC	M	1750	WE	C	11.3	10,075	4	BW	Air,Ro Ret	CV	El	AS	236	5	453	10	CHH
34	2	990	2250	PP	RC	M	1500	LA	O	18	....	N	N	N	N	N	N	...	6	465	....	WE,SWE
35	2	935	2250	PP	RC	M	1500	....	O,G	1090[2]	...	N	N	N	N	N	N	..	5	458	82 7	YU,CHH
36	2	945	2296	...	RC	M	....	....	G	1096[2]	9979	N	N	N	N	N	N	143	...	...	...	....
37	N	N	N	N	N	N	N	N	N[40]	...	21,900	N	N	N	N	N	N	N	N	N	N	N
38	2	520	1178	BPC	RC	M	450	GE	C[14]	9035	....	2	FW	St,Ret	DP	Me	.....	110	4	368	40	YU
39	3[42]	560	830	IR	RC	M	400	WE	O,G[11]	1900[2]	....	N	N	N	N	N	N	120	3	350	51	CHH
MUNICIPAL AND COOPERATIVE INSTALLATIONS																						
40	2[43]	4550,90	2200,1850	BJ	S,RC	T,M	10,200,3500	WE	G	1038[2]	...	N	N	N	N	N	N	...	5	460	125	YU
41	1	4550	2445	AC	S	T	10 200	GE	G	1038[2]	...	N	N	N	N	N	N	...	5	...	...	...
42	2[43]	4950,1750	2500	BJ	HyC,RC	MTS M	4000	GE	C	10	9500	N[44]	N	Air,Ro,Ret	DP	El	RC	400	5	480	150	YU,SWE
43	2	3580	2230	BJ	RC	M	2500	GE	L	6 3	...	...	...	St,Ret	DP	Me	RC	250	5	465	60	FW,CH
44	2	1870	3025	PP	HyC	M	4500	AC	O,G	12.5,1000[2]	...	3	FW	St,Ret	DP	El	BU	300	5	466	57.2	...
45	2	1400	2400	AC	RC	M	2500	AC	C	11.2	...	3	FW	St,Ret	CV	El	RC	350	5	464	108	SWE,SY
46	2	1100	2500	PP	RC	M	1750	AC	O,G	12.5,1052[2]	8820	3	RS	St,Ro,Ret	CV	El	RC	250	4	443	93	YU,CH
47	2	1450	1625	...	RC	M	2000	...	C	10.27	...	3	BW	Air,Ro,Ret	DP	El	AS	269	5	440	75	YU,CH
48	2	935	820	WO	HyC	M	1250	LA	G	1052[2]	8741	N	N	N	N	N	N	150	5	450	...	SWE
49	2	315	1400	BPC	RC	M	400	...	O,G[11]	1002[2]	...	N	N	N	N	N	N	150	...	...	...	...
50	2	300	2000	PP	RC	M	390	GE	O,G[11]	1050[2]	10,600	N	N	N	N	N	N	50	3	363	50	OLD

to 775 MW—only four cross-compounds appear

TURBINE				CONDENSER					FEEDWATER			GENERATOR			CONTROLS					PROJECT
	No. of bleed points	No. of exhausts	Manufacturer	Surface, 1000 sq ft	No. of water passes	Tube material	Air removal	Manufacturer	Makeup treatment	Condensate treatment	System manufacturer	Voltage, kV	Rating, MVA	Cooling, rotor stator	Combustion, mfr	Feedwater, mfr	Closed-circuit tv mfr	Data logger mfr	Computer mfr	
	8	2	BB	47.4	1	Adl,CuNi[23]	..	..	De	De Pdx	..	24	22[24]	H_2 Li	BM	BM	N	..	..	1
	..	..	..	..	..	CuNi	Ro	SWE	De	De	LAW IW[21]	24	667	H_2 Li	BM	BM	N	N	GE	2
	..	..	GE	97.4	..	SSt	Ro	B,LH	De	Pdx	..	22	875	H_2 Li	..	..	..	..	..	3
	6	2x6	GE	96..	..	AsCu	Ro	IR	Sc,SF	De,SF	PM,CR,L[21]	24	907	Li	HCC	HCC	DP	N	N	4
	7	4x6	GE	96[2]	..	AsCu	Ro	WO	Sc,SF	De,SF	PM,CR,L[21]	24	907	Li	HCC	HCC	DP	N	N	5
	..	..	..	355	..	..	J,Ro	IR	Sc	De	..	22	475,434	H_2	HCC	HCC	..	N	N	6
	..	..	..	..	..	SSt	Ro	..	De	De,pH	..	22	..	H_2 Li	..	..	N	N	..	7
	7	..	GE	120	1	SSt	Ro	IR	De	Pdx,pH	COC	24	895	H_2 Li	LN	LN	..	LN	LN	8
	6	4	AE	70[2]	..	Adl	J	AE	De	..	..	20	614	H_2	..	..	..	..	..	9
	..	4	AE	85[2]	..	AdB	Ro	WE	De	De	..	25	945	H_2 Li	..	..	N	N	N	10
	8	6	WE	55[2]15	..	Adl	Ro	WE	De	De	IN	20	830	H_2	BM	BM	..	GE	GE	11
	9	4	GE	325	2	AsCu	Ro	IR	De	De,pH	IW,GR	24	678	Li	BM	BM	DP	GE	GE	12
	6	4	WE	89[2]	..	CuNi	J	IR	Evap	De	..	22	695	H_2	HCC	HCC	DP	N	N	13
	7	4	GE	310 25	..	CuNi	RP	WE	De	De,SF,pH	..	24	695	H_2,Li	....	....	....	..	....	14
	7	4	WE	315 25	..	CuNi	RP	WE	De	De,SF,pH	....	18	695	H_2	....	....	....	....	....	15
	7	2	WE	210	1	SSt	Ro	B,LH	De	Pdx	GW	16	645	H_2	LN	LN	..	N	N	16
	7	4	GE	214	1	Adl	Ro	FW	De	De	COC	24	665	H_2,Li	BM	BM	N	COC	COC	17
	6	4	GE	216	4	Adl	Ro	WE	De	N	PM	24	572	H_2	LN	LN	CPL	LN	N	18
	6	4	GE	227	1	Adl	Ro	WE	De	pH	IW	22	630	H_2	..	..	N	H	N	19
	6	4	WE	216	1	Adl	Ro	WE	De	pH	IW	22	630	H_2	..	..	N	..	N	20
	7	3	WE	203	1	SSt,AdB	RP	WE	De	pH	..	16	505	H_2	HCC	HCC	..	N	GE	21
	7	2	WE	136	1	SSt	Ro	B,LH	De	De	..	24	..	H_2	..	..	N	..	..	22
	7	2	GE	210	1	A,B	J	FW	De	N	IW	22	473	H_2,Li	BM	BM	DP	N	N	23
	16	2	GE	220	2	SSt	Ro	IR	De,So	Pdx	IWT GW	22	520	H_2,Li	LN	BM	DP	BM	BM	24
	7	4	GE	130	1	A1B	RP	WO	De	....	IW	22	430	H_2,Li	HCC	HCC	N	..	N	25
	4	2	GE	147.4	1	Adl	Rc	SWE	De[36]	De	COC,IN[21]	22	440	H_2,Li	F	F	....	....	....	26
	6	2	GE	164	2	Adl	Ro	SWE	Evac,So	..	....	22	490	H_2,Li	..	....	....	....	....	27
	6	2	WE	140	2	SSt,AdB	J	WE	De	De	....	24	384	H_2	BM	....	....	....	....	28
	6	..	WE	..	..	..	....	....	De	....	....	20	410	H_2	..	..	..	....	....	29
	6	2	WE	170	2	Adl	J	IR	De	pH	IW PM	22	320	H_2	HCC	HCC	DP	GE	GE	30
	6	2	WE	143	2	SSt	J	WE	Sub,De[39]	De	..	22	275	H_2	LN	LN	KNT	GE	GE	31
	5	2	GE	60	2	Adl	..	FW	De	..	..	13.8	140	H_2,Li	BM	BM	DP	N	N	32
	4	1	GE	69	1	SSt,Adl	Ro	IR	De	..	PM	14.4	150	H_2	..	..	DP	LN	N	33
	6	1	GE	75	1	A1B	J	WE	De	De,SF	COC	13.8	140	H_2	F	F	DP	F	F[29]	34
	4	2	GE	47.5	2	Adl	Ro	IR	De	..	IW	13.8	135.3	H_2	F	F	N	N	N	35
	5	2	GE	..	....	..	....	....	Evap	pH	..	14.4	128	H_2	..	..	..	N	....	36
	N	1	TCC	B	J	N	J	IR	N	N	N	13.8	66	H_2	N	N	N	N	N	37
	4	1	GE	Drv	N	Steel	J	GEA	De	pH	COC	13.8	20	H_2	BM	BM	N	N	N	38
20 psig	N	1	GE	N	N	N	N	N	De	..	..	13.8	19	Air	BM	BM	N	N	N	39
	6	2	WE	175	2	Adl	Ro	B,LH	De	N	IW	24	414	H_2	RF	PF	N	RI	N	40
	..	..	GE	..	..	Adl	Ro	SWE	De	..	..	..	992	H_2	..	..	..	..	..	41
	..	..	WE	124	2	Adl	Ro	FW	De	Pdx	GW	18	329	H_2	BM	BM	DP	F	F	42
	6	2	GE	115	2	SSt	J	MS	De	..	COC	22	259	H_2,Li	FIS	FIS	DP	FIS	N	43
	7	4	GE	140	2	SSt,AsCu	Ro	FW	De	De	..	20	256	H_2,Li	BM	BM	N	N	N	44
	5	2	WE	88	2	CuNi,AsCu	Ro	MS,NSH	De	N	HT	18	205	H_2	HCC	HCC	N	N	N	45
	..	..	GE	74	2	Adl	J	MC	De	..	COC	13.8	126	H_2	BM	BM	N	N	N	46
	5	1	GE	56	2	Adl	J	CL	..	N	..	17.8	88.2	H_2	..	..	..	N	N	47
	5	1	WE	65	2	AdB	Ro	SWE	De	pH	IN,BE	13.8	88.2	H_2	BM	..	..	N	N	48
	6	2	GE	90	2	Adl	Ro	SWE	....	....	..	13.8	95.5	H_2	SM	BM	N	N	N	49
	4	1	GE	53	2	Adl	J	FW	De	De	CFL	13.8	74.9	H_2	RF	RF	N	N	N	50

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2 NUCLEAR-POWERED CENTRAL STATIONS

Nuclear attraction still grea

PROJECT	REACTOR					STEAM GENERATOR					PRIMARY OR FEED PUMPS							FUEL				
	Moderator	Coolant	Inlet temp, F	Outlet temp, F	Pressure, psig	Number per unit	Manufacturer	Outlet temp, F	Pressure, psig	Steam flow, 1000 lb per hr	Number per unit	Capacity each, gpm	Discharge pressure, psig	Manufacturer	Flow control	Drive	Drive horsepower	Drive manufacturer	Material	Enrichment, percent	Burnup, MW-days/tonne	Maximum center temp, F	Element form
1	H_2O	H_2O	....	....	....	4	WE	....[18]	790	14,905	4	....	....	WE	N	T	....	....	UO_2	....	....	....	Rod
2	H_2O	H_2O	420	563	1020	N	N	....	....	....	2	45,200	710[9]	GE	S	M	7635	GE	UO_2	2.5[734]	25,140	4380	7x7 rod array
3	H_2O	H_2O	539	602	2235	4	WE	519	805	14,129	4	88,500	2235	WE	N	M	6000	WE	UO_2	2.2,2.7,3.2	12,000[28]	4450	204 rod assem
4	H_2O	H_2O	376	545	1000	N	N	....	..	13,380	2	45,000	1329	BJ	S	M	....	....	UO_2	2.56[27]	25,000	4380	Pel,rod
5	H_2O	H_2O	378	540	1000	N	N	....[18]	1000	14,000	3	12,270[10]	1175	BJ	S[3]	T	7200	GE	UO_2	2.19[27]	19,000	4380	Pel,7x7 rod array
6	H_2O	H_2O	539	608	2250	4	WE	506	705	14,120	4	88,500	2778	WE	....	T	....	BB	UO_2	2.2-3.2	21,300[27]	4100	Pel,pins
7	H_2O	H_2O	539	607	2250	4	CE	512	743	13,383	4	88,500	2778	WE	N	M	6000	WE	UO_2	2.2,2.7,3.2[4]	21,300[27]	4100	15x15 rod array
8	H_2O	H_2O	539	602	2250	4	WE	506	720	14,000	4	88,500	2485	WE	S	T	7760[7]	WE	UO_2	2.17-2.67	33,000	4100	15x15 rod array
9	H_2O	H_2O	539	602	2250	4	WE	506	705	13,990	4	88,500	2250	WE	R,S	T,M	9350	WE	UO_2	2.2,2.7,3.2	....	....	204 rod assem
10	H_2O	H_2O	543	596	2235	4	WE	556	1085	13154	4	89,700	2728	WE	....	T	6600	WE	UO_2	2.727	14,500[28]	4090	Pel
11	H_2O	H_2O	549	607	2250	4	WE	514	755	13156	4	88,500	2778	WE	N	M	6000	WE	UO_2	3.234	31,000	4250	15x15 rod array
12	H_2O	H_2O	555	603	2185	2	BW	570	910	10,500	4	88,000	2500	BJ	....	T	9000	....	UO_2	2.29,2.64,2.30	28,200	4160	Pel
13	H_2O	H_2O	388	512	1500	12[37]	GE	538	135	12,300	6	31,000	1750	BJ	S	D	9100	EL	U	....	....	....	Tubular
14	H_2O	H_2O	555	603	2185	2	BW	570	910	5300[6]	4	88,000	2500	BJ	N	T	10,000	....	UO_2	1.5-3.0	27,000	4160	Pel
15	H_2O	H_2O	555	603	2185	2	BW	570	910	5300[6]	4	88,000	2500	BPC	N	M	5600	AC	UO_2	2.29,2.64,2.94	24,560	4160	Rod
16	H_2O	H_2O	555	603	2185	2	BW	570	910	5300[6]	4	88,000	3708	BPC	N	T	7200	WE	UO_2	2.427	28,000	4160	Pel
17	H_2O	H_2O	420	....[18]	1005	N	N	....[18]	1005	....	2	45,200	....	GE	....	....	....	....	UO_2	2.2327	19,000	4380	Pel,rod
18	H_2O	H_2O	550	604	2235	2	CE	520	800	11,176	4	83,300	2235	....	....	M	5500	....	UO_2	2.5	25,000	4300	14x14 rod array
19	H_2O	H_2O	555	603	2185	2	BW	569	910	10,521	4	88,000	2500	BPC	N	T	....	AC	UO_2	2.94	28,200	4160	Pel
20	H_2O	H_2O	555	603	2185	2	BW	570	910	5300[6]	4	88,300	3628	BPC	....[12]	M	5950[33]	AC	UO_2	2.9434	28,230	4160	15x15 rod array
21	H_2O	H_2O	549	611	2250	3	WE	516	753	10,596	3	....[32]	2808	WE	N	M	5600	WE	UO_2	....	31,500	....	Rod
22	H_2O	H_2O	550	604	2235	2	CE	520	800	5360[6]	4	81,200	....	BJ	N	....	....	WE	UO_2	3.03	28,000	3775	Pel,rod
23	H_2O	H_2O	550	604	2235	2	CE	520	800	5360[6]	4	81,200	....	BJ	N	....	....	WE	UO_2	3.03	28,000	3775	Pel,rod
24	H_2O	H_2O	555	603	2185	2	BW	570	910	5300[6]	4	88,000	....	....	....	....	....	....	UO_2	2.8	25,000	4160	....
25	H_2O	H_2O	543	606	2235	3	WE	505	695	10,600	3	88,500	9158	WE	N	M	6000	WE	UO_2	2.44,2.54,2.394	21,800	4100	15x15 rod array
26	H_2O	H_2O	543	606	2235	3	WE	510	720	10,600	3	88,500	9158	WE	N	M	6000	WE	UO_2	2.44,2.54,2.944	21,80027	4100	15x15 rod array
27	H_2O	H_2O	387	545	1020	N	N	545	1020	....	2	....	....	....	....	T	....	....	UO_2	2.23	19,000	4380	7x7 rod array
28	H_2O	H_2O	530	545	1000	N	N	545	1000	8620	2	45,000	....	BJ	S	M	9000	GE	UO_2	2.027	15,000	3725	Rod
29	H_2O	H_2O	530	545	1000	N	N	545	1000	8620	2	45,300	....	BJ	S	M	9000	GE	UO_2	2.027	15,000	3725	Rod
30	H_2O	H_2O	367	543	1005	N	N	....	....	9560	2	12,300[10]	1082	BJ	S	T	9700	GL	UO_2	2.1527	19,00027	4380	7x7 rod array
31	H_2O	H_2O	550	602	2235	3	CE	520	800	10,720	3	....	....	....	....	....	....	....	UO_2	....	30,000	....	Pel,rod
32	H_2O	H_2O	283	546	1005	N	N	546	1005	....	2	45,200	1050	BJ	S	M	5000	GE	UO_2	2.20	24,800	5000	Pel,rod
33	H_2O	H_2O	545	595	2100	3	WE	510[13]	745[13]	10,300	3	88,800	2568	WE	R	M	6000	WE	UO_2	....	27,000	4000	Pel
34	H_2O	H_2O	547	600	2290	3	WE	510	745	10,900	3	88,000	2250	WE	....	M	5500	WE	UO_2	2.5	27,000	....	15x15 rod array
35	H_2O	H_2O	550	591	2190	2	CE	514	770	9400	4	83,000	2308	BJ	N	T	4500	AC	UO_2	2.74	24,000	....	Pel
36	H_2O	H_2O	523	545	1000	N	N	545	1000	7600	2	45,000	1375	....	S	M	2500	....	UO_2	2.18	25,000	3400	7x7 rod array
37	H_2O	H_2O	363	545	1015	N	N	546	1015	6740	3	9760[10]	1650	IR	R	M	7000	GE	UO_2	2.0727	15,300	3500	Rod
38	H_2O	H_2O	545	584	2150	4	WE	502	575	19394	4	67,200	2235	WE	....	M	4000	WE	UO_2	3.327	25,000	2300	Pel rod
39	H_2O	H_2O	365	545	1000	N	N	545	1000	6740	2	39,000	1375	....	S	M	3000	....	UO_2	3	15 000	4500	Rod
40	H_2O	H_2O	386	545	1000	N	N	545	1000	....	2	27,100	1350	....	S	M	3500	....	UO_2	2.28,2.5514	18,900;24,93014	5080	Pel;7x7 rod array
41	H_2O	H_2O	555	603	2185	2	BW	570	910	10,560[34]	4	88,000	....	....	....	....	....	....	UO_2	2.8	25,000	4160	....
42	H_2O	H_2O	545	607	2250	3	WE	510	735	7090	2	89,000	2500	WE	....	....	....	....	UO_2	3	21,000	....	Rod
43	H_2O	H_2O	372	530	1005	N	N	540	1000	....	2	29,200	1137	BJ	HyC	M	4500	WE	UO_2	2.29	20,000	3170	7x7 rod array
44	H_2O	H_2O	545	568	2235	2	WE	511	735	7090	2	89,000	2235	WE	....	M	6200	....	UO_2	2.4-2.9	21,800	....	14x14 rod array
45	H_2O	H_2O	301[1]	540	1050	N	N	540	1000	5855	5	32,900	1069	BJ	S	M	4000	GE	UO_2	1.19,1.67,2.424	15,300	3200	Pel
46	H_2O	H_2O	544	546	1000	N	N	546	1000	....	5	36,900	1050	BJ	S	M	1000	GE	UO_2	2.10	23,200	3600	Pel,rod
47	H_2O	H_2O	552	550	2235	2	WE	513	729	30064	2	39,300	2335	WE	N	M	5600	WE	UO_2	2.8	24,500	4050	Pel,7x7 rod array
48	H_2O	H_2O	552	550	2235	2	WE	513	729	30084	2	39,300	2335	WE	N	M	5100	WE	UO_2	2.8	24,500	4050	Pel;7x7 rod array
49	H_2O	H_2O	546	587	2050	4	WE	502	575	6194	4	63,000	2050	WE	N	M	3080	WE	UO_2	3.4,3.8,4.2	12,900[28]	....	Rod
50	H_2O	H_2O	547	539	2085	2	CE	514	755	11124	4	47,530	2085	BJ	N	M	3000	....	UO_2	1.6-2.95	27,360	4320	Pel,176 rod assem
51	H_2O	H_2O	552	607	2235	2	WE	518	781	27504	2	90,300	2225	WE	N	M	4500	WE	UO_2	3.05	27,300	3920	Pel,rod array
52	H_2O	H_2O	553	597	2085	2	WE	505	695	5706	3	59,500	2100	WE	N	M	4000	WE	UO_2	3.15-3.85	27,300	3960	Pel
53	D	He	750	1430	700	2	GA	1000	2400	2220	4	870 206[15]	700	GA	S	T	5750	GA	U,Th	93	100,000	....	Coated particles[16]
54	H_2O	H_2O	540	610	1535	4	FW	462	485	2220	8	6,400	1258	WE	N	M	1500	WE	UO_2	4.117	22,500	3250	Pel,pin
55	H_2O	H_2O	514	545	1010	4	FW	546	1010	9540	4	....	....	....	....	....	....	....	UO_2	3.5	38,000	5010	Pel
56	H_2O	H_2O	535	593	2000	4	WE	560	640	2100	4	22,700	2000	WE	....	M	....	WE	UO_2	4.1-4.3	42,900	3300	Pel
57	W	Na	550	1150	30[26]	3	CR	922	570	540	3	0.0619	....	BJ	....	M	100	GE	U Mo	0.4-25.5[26]	5000	.115	Pin
58	H_2O	H_2O	510	562	1395	4	WE	466	565	740	4	....	....	WE	....	....	....	....	UO_2,ZrO$_2$,Na	2[23]	7830	.1433,.1625[23]	Rect pel
59	H_2O	H_2O	525	550	1225	N	N	546	515	960	2	....	....	BJ	....	M	....	....	UO_2	2.2	11,300	3250	Pel
60	H_2O	H_2O	525	547	1020	N	N	547	1020	576	2	....	....	....	....	....	....	....	UO_2	2.6,2.814	11,300	3250	Pel
61	H_2O	H_2O	495-569[25]	439-570[25]	900-960[25]	N	N	525	560	6416	2	....	....	....	....	....	....	....	UO_2	2.2,3.3[25]	7800	4215,1270[25]	Pel,SSt cermet[25]
62	H_2O	H_2O	563	618	1225	N	N	....	....	....	2	15,300	358	AC	HyC	M	350	AC	UO_2	3.63	15,000	4650	10x10 rod array
63	D	He	552	1018	725	2	NTR	1000	1450	3684	2	227,700[35]	525	CLR	HyD	M	1500	EL	U,Th	93	50,000	2427	Coated particles[16]
64	H_2O	H_2O	450	527	1322	2	FW	525[24]	600	1225	....	....	....	....	....	....	....	....	UO_2,ThO$_2$	33	6700	....	Pel,5x5 rod array

SYMBOLS USED ABOVE continued

Chem - Chemical shim
CR - Control rods
CRA - Control rod assembly
Dow - Dowtherm
EBWR - Experimental boiling water reactor
FBR - Fast breeder reactor
GT - Gas turbine
HTGR - High temperature gas cooled reactor

HyC - Hydraulic coupling
HyD - Hydrodynamic drive
H_2 - Hydrogen
H_2O - Light water
MC - Moderator
M - Motor
Mo - Molybdenum
N - None
Na - Sodium
Nat - Natural uranium

Once - Once through
PIX - Powdered ion exchange
Pel - Pellet
PM - Pin control
Pond - Recirculation from cooling pond
PWR - Pressurized water reactor
R - Regulator control
RP - Rotary pump or blower
RP - Rec. circulating pump
S - Speed control
SC - Single cylinder

rger units because of low fuel-cycle cost

TURBINE			CONDENSER					FEEDWATER			GENERATOR				CONTROLS					PLANT NAME	PROJECT
No. of exhausts	No. of bleed points	Exhaust pressure, in Hg	Manufacturer	Surface, 1000 sq ft	No. of water passes	Tube material	Air removal	Manufacturer	Makeup treatment	Condensate treatment	Cooling water	Voltage, KV	Rating, MVA	Stator cooling	Rotor cooling	Reactor, mfr	Feedwater, mfr	Data logger, mfr	Computer, mfr	Closed-circuit tv, mfr		
	7	2	WE	....	....	....	....	....	....	....	....	24	1356	H_2O	H_2	WE	....	....	....	WE	Sequoya	1
	6	2	AE	725	1	AlB	J	....	Evap	De,pH	Once	22	1222	H_2O	H_2	GE	GE	....	GE	GE	.....	2
	6	1.5	WE	618	1	CuNi	Ro,J	IR	Evap,De	Chem	Once	25	1260	H_2O	H_2	WE	WE	N	....	....	Diablo Canyon	3
	5	2	GE	666	1	Adl,CuNi	J	FW	De	Pdx	Once	22	1280	H_2O	H_2	GE	GE	....	GE	GE	Browns Ferry	4
	5	1.5	GE	790	1	Adl,CuNi	J	IR	De	De	Once,CTo	22	1280	H_2O	H_2	GE	....	....	....	GE	Peach Bottom	5
	6	1.5	GE	....	1	AsCu	..	....	De	pH	Once	26	1280	H_2O	H_2	WE	.	N	WE	WE	Donald C Cook	6
	6	1.5	WE	890	1	304 SS	Ro	..	De	Chem	Once	25	1260	H_2O	H_2	....	.. .	....	....	....	Salem	7
	..	1.5	WE	....	....	....	....	....	....	....	....	24	1260	H_2O	H_2	....	.. .	....	....	....	Diablo Canyon	8
	6	1.5	WE	594	1	SSt	Ro,J	WE	De	pH	Once	24	1220	H_2O	H_2	WE	....	....	....	WE	Zion	9
	6	1.3	WE	306[9]	1	Adl	J	WE	Evap	..	Once	22	1126	H_2	H_2	....	....	..	....	....	Indian Point	10
	6	1.5	WE	915	1	Adl	J	WE	Evap	pH	Once	22	1126	H_2	H_2	....	....	....	....	....	Indian Point	11
	6	1.6	WE	....	1	....	..	....	De	De	Once	22	....	H_2	H_2	BM	BM	N	BM	BM	Russellville	12
	4	1.5	GE	707	2	Ad	J	WE	De	Pdx	Once	22.5	432	H_2O	H_2	RKR	BM	DEC	IS	IS	Hanford No 1	13
	6	2	WE	596	1	SSt	RP	..	De,So	De	Once	22	984	H_2	H_2	BM	BM	.	BM	BM	Crystal River	14
	6	2-8	GE	678	....	....	....	IR	De	Pdx	Hyp	19	968	H_2,H_2O	H_2	BM	BM	BM	....	BM	Three Mile Island	15
	6	1.0-	GE	510	1	SSt	J	BLH	De	....	Once	19	1038	H_2O	H_2	BM	BM	....	....	GE	Oconee	16
	6	1.5	GE	450	1	....	J	....	De	De	Once	20	1000	H_2O	H_2	GE	....	....	....	GE	Bell	17
	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	Millstone	18
	6	2	WE	600	2[9]	CuNi	Ro	....	De	De	Once	22	949	H_2	H_2	BM	BM	N	BM	BM	Oyster Creek	19
	6	2.5	WE	....	....	....	....	....	De	De[11]	CTo	22	1070	H_2	H_2	BM	BM	....	....	BM	Rancho Seco	20
	6	1.5	WE	390	1	SSt	J	.. .	De	....	Once	22	946	H_2	...	WE	WE	N	WE	WE	Beaver Valley	21
	6	1.5	GE	453	1	CuNi	Ro	MS	De	....	Once	19	1000	H_2O	H_2	....	....	....	..	.	Calvert Cliffs	22
	6	1.5	WE	453	1	CuNi	Ro	MS	De	.. .	Once	22	1000	H_2	H_2	....	....	....	....	.. .	Calvert Cliffs	23
	....	....	GE	..	..	....	....	....	De	De	Pond	....	970	H_2O	H_2	BW	...	....	..	..	Midland	24
	6	1.5	WE	580	1	CuNi	J	IR	Evap,De	pH[11]	Once	22	941	H_2	H_2	WE	....	N	....	. .	Surry	25
	6	1.5	WE	....	1	....	J	IR	....	pH[11]	Once	22	942	H_2	H_2	WE	HCC	N	WE	WE	North Anna	26
	....	....	GE	....	....	....	....	....	....	....	CTo	....	....	....	....	....	....	....	....	....	Edwin I Hatch	27
	4	1.5	GE	650	1	SSt	J	IR	De	De	Once	18	920	H_2O	H_2	GE	CV	....	GE	GE	Dresden	28
	4	1.5	GE	650	1	SSt	J	IR	De	Pdx	Once	18	920	H_2O	H_2	GE	CV	....	GE	GE	Quad Cities	29
	5	2	WE	465	1	SSt	J	MS	De	Pdx	Once	22	983	H_2	H_2	GE	....	....	GE	GE	Cooper	30
	6	1.5	WE	..	1	....	J	.. .	De	....	Once	22	900	H_2	H_2	....	....	...	....	..	Bailey Point	31
	5	2.0	GE	330	1	SSt,Ad	Ro,J	WE	De	De	Once	18	935	H_2O	H_2	GE	GE	....	GE[31]	GE[31]	.....	32
	6	2.1	WE	2257	1	SSt,Adl	RP	WE	De	Chem	Once	22	854	H_2	H_2	....	....	....	WE	WE	H B Robinson	33
	7	2.5	WE	....	1	....	....	FW	De	....	Once	22	894	H_2	H_2	....	BM	....	....	....	Turkey Point	34
	10	2	WE	510	1	SSt,Ad	J	IR	De	....	Once	22	....	....	...	....	....	. ..	. ..	....	Palisades	35
	5	1.5	GE	384	1	AlB	J	....	De	De	Once	24	780	H_2O	H_2	...	....	..	....	....	Pilgrim	36
	5	1.5	GE	443	1	AlB,CuNi	Ro,J	IR	Sub	De	Once	24	735	H_2	H_2	GE	GE,CV	....	GE	GE	Millstone	37
	6	1.5	WE	1757	1	SSt,Adl	J	WE	De	Chem	Once	19	667	H_2	H_2	WE	HCC	N	IBM	N	Haddam Neck	38
	5	1.75	GE	390	2	Adl	J	WO	De	Pdx	Once,CTo	22	632	H_2O,H_2	H_2	....	....	..	....	..	Monticello	39
	5	1.9	GE	....	....	CuNi	J	....	....	....	Once	22	622	H_2O	H_2	GE	....	....	...	GE	Shoreham	40
	....	..	GE	....	....	....	....	....	De	De	Pond	....	663	H_2O	H_2	BW	...	....	.. .	....	Midland	41
	5	1.5	WE	....	....	..	....	.. .	....	. .	....	19	659	H_2	H_2	....	....	...	....	....	Prairie Island	42
	5	2.25	GE	315	1	Adl	J	SK	De	pH	Once	22	626	H_2O,H_2	H_2	....	....	....	.. .	...	Vermont Yankee	43
	....	1.5	WE	....	....	....	....	....	De	De	Once	19	659	H_2	H_2	WE	WE	....	....	....	Kewaunee	44
	3	1.5	GE	423	1	AlB	J	WO	De	De	Once[20]	24	687.5	H_2O	H_2	GE	GE	N	N	N	Oyster Creek	45
	6	1.5	GE	400	1	SSt,Ad	R,J	WE	De	De	Once	24	755	H_2O	H_2	GE	GE	....	GE	GE	Nine Mile Point	46
	5	1.35	WE	1257	1	Adl	J	WE	De	Chem	Once	19	582	H_2	H_2	WE	....	....	WE	WE	Point Beach	47
	5	1.35	WE	1257	1	Adl	J	WE	De	Chem	Once	19	582	H_2	H_2	WE	....	....	WE	WE	Point Beach	48
	..	1.5	..	....	....	....	....	..	De	N	Once	....	....	....	....	....	....	....	....	....	Malibu	49
	6	1.5	GE	350	2	SSt	Ro	FW	De	....	Once	22	591	H_2O	H_2	....	....	....	....	....	Fort Calhoun	50
	5	1.35	WE	125.57	1	SSt,Adl	J	WE	De	pH	Once	19	608	H_2	H_2	F	F	N	WE	WE	Robert E Ginna	51
	5	1.5	WE	300	1	CuNi	J	WE	Evap	pH	Once	18	500	H_2	H_2	F	HCC	CHU	DMC	N	San Onofre	52
	6	2.5	..	....	2	Adl	J	..	De	De	CTc	22	403	H_2O	H_2	....	....	....	..	....	Fort St Vrain	53
	4	2	WE	2127	1	Adl	J	IR	Evap,De	....	Once	16.5	330	H_2	H_2	GE	BM	CHU,RCA	N	N	Indian Point	54
	....	...	GE	...	....	....	....	....	....	....	....	14.4	245.5	H_2	H_2	...	...	....	....	....	Dresden	55
	...	1.5	WE	.	..	..	...	....	...	....	....	16	160	H_2	H_2	WE	....	....	....	....	Yankee	56
	....	1	AC	....	.. ..	..	....	....	De	. ..	Once	18	186	H_2	H_2	AC	..	....	N	N	Enrico Fermi	57
	....	1.5	WE	....	.. ..	..	....	. ..	De	De	Once	15.5	136	H_2O	H_2	WE	. ..	....	....	....	Shippingport	58
	..	1.6	..	...	....	....	....	....	...	....	....	13.8	79	H_2O	H_2	GE	GE	. ..	GE	GE	Big Rock Point	59
	....	3.5	GE	..	....	.. .	....	....	De	De	Once	13.8	76.8	H_2	H_2	GE	..	....	....	....	Humboldt Bay	60
	.	...	AC	....	....	.. .	....	. ..	De	De	Once	13.8	88	H_2	H_2	AC	....	....	N	N	Pathfinder	61
	2	0.5	AC	70	2	Adl	Ro,J	AC	De	De	Once	13.8	76.6	H_2	H_2	VR_L	F	...	....	....	LaCrosse (LACBWR)	62
	4	1.5	WE	30	1	Ad,SSt	Ro,J	WE	De	Pdx	Once	13.8	54	H_2	H_2	CCC	F	GPL	N	N	Peach Bottom	63
	....	1.5	EL	....	....	....	....	....	De	SF	Once	13.8	27.2	H_2O	Air	AC	....	....	N	N	Elk River	64

Mfg Co
Electrical Industries Ltd
opment Associates, Inc
Inc
ur
mination Corp
Co
Co,
Atkinson Co

BW - Babcock & Wilcox Co
CCC - Consolidated Controls Corp
CE - Combustion Engineering, Inc
CHU - Conu Corp
CLK - Clark Bros Div of Dresser Industries
CV - Copes-Vulcan Div, Blaw-Knox Co
DEC - Diamond Electric Corp
DL - De Laval Turbine, Inc
DMC - Data-Master Corp
EL - Elliott Co, Div of Carrier Corp
F - The Foxboro Co

FW - Foster Wheeler Corp
GE - General Electric Co
GGA - Gulf General Atomic Inc
GPL - General Precision, Inc
GR - Griscom-Russell Corp
HCC - Hagan Controls Corp, Sub of Westinghouse Electric Corp
IBM - International Business Machines Corp
IR - Ingersoll-Rand Co
IS - Instrument Systems, Inc
MS - Maryland Shipbuilding & Drydock Co

NTR - Nooter Corp
RCA - Radio Corporation of America
RKR - Rucker Co
SHK - Schutte & Koerting, Inc
VRL - Yard Co, Div of Koval Industries, Inc
WE - Westinghouse Electric Corp
WO - Worthington Corp

4 STEAM SYSTEMS
Table 2 250 to 135 psig

More oil-fired boilers use additive

PROJECT	COMPANY	LOCATION	CONSULTING ENGINEER	Date of initial operation	New or existing plant	Principal steam use	BOILERS							FUEL*	
							No. new units, type	Manufacturer	Capacity each, 1000 lb per hr or M Btu	Operating pressure, psig	Operating temp, F	Heating surface, 1000 sq ft, incl boiler, waterwall and superheater	Type	Max sulfur content, %
55	Cooper Tire & Rubber Co	Texarkana, Ark	Solvanos Associates	1968	Ex	Pr,SH	1 Pk	UR	60	250	406	5	G	
56	University of New Mexico	Albuquerque, NM	Bridgers & Payton	1969	Ne	SH	1 Pk	CE	100	235	500	....	G	
57	Holy Cross Hospital	Chicago, Ill		1968	Ex	SH	1 Pk	BW	40	250	Sat	4	O,G	
58	Schenuit Rubber Co	Baltimore, Md		1968	....	Pr	1 Ft	KEE	40	250	Sat	2.9	O	
59	U S Plywood Co	Oxford, Miss		1968	Ne	Pr,SH	1 Ft	RU	70.7	235	400	6.7	G,Wd,Bk	
60	Kind & Knox Gelatine Co	Camden, NJ	H M Wilson Co	1968	Ex	Po,Pr	1 Pk	BW	50	230	Sat	....	O	
61	The Boeing Co	Everett, Wash	Bumstead-Woolford Co	1968	Ex	SH	1 Pk	UR	125	220	599	15.2	O,G	
62	Kimberly Clark Corp	Beech Island, SC		1968	Ne	Pr,SH	2 Pk	CE	130	225	Sat	....	O,G	
63	Boaurding Purd & Paper Co	Newberg, Ore	H A Simons, Ltd	1967	Ex	Pr	2 Pk	CE	125	225	Sat	....	G	
64	Velsicol Chemical Corp	Memphis, Tenn	A M Kinney, Inc	1968	Ex	Pr	1 Pk	CE	75	225	440	6.3	O,G	0.35
65	Eastman Kodak Co	Gates, NY		1968	Ne	Po,SH	1 Pk	MW	70	225	Sat	....	O,G	1.4
66	General Motors Corp, Chevrolet Div	Saginaw, Mich	Giffels & Rossetti, Inc	1968	Ex	SH	2 Pk	CE	120	212	Sat	10 4	O,G	2.8
67	U S Sugar Corp	Clewiston, Fla	Arthur G Keller, Inc	1968	Ex	Po,Pr	2 Fr	UR	150	210	492	20.7	O,Bg	
68	Armco Steel Corp	Butler, Pa		1968	Ne	Po,Pr	1 Pk	BW	50	210	465	4 6	G	N
69	International Paper Co	Gatineau, Que, Can	Sandwell & Co	1968	Ex	Pr	1 Ft	CE	300	200	450	20	O	2.5
70	University of Toronto	Toronto, Ont, Can	H G Acres & Co, Ltd	1968	Ex	SH	1 Ft	BWC	200	200	Sat	12.4	O,G	3
71	McMaster University	Hamilton, Ont, Can	H G Acres & Co, Ltd	1968	Ex	SH	1 Ft	FW	150	200	415	7 914	O	3
72	Washington State University	Pullman, Wash	W O Stevens & Co	1968	Ex	SH	1 Ft	CE	125	200	Sat	11.4	O,G	
73	Baltimore Gas & Electric Co	Baltimore, Md		1968	Ex	Pr,SH	1 Pk	CE	110	200	Sat	6.6	O,G	2.5
74	Kendall Co, Textile Div	Bethune, SC	Lockwood-Greene Engineers, Inc	1967	Ex	Pr	1 Pk	CE	100	200	381	3.3	O,G	2.8
75	Canadian International Paper Co	Matane, Que, Can	Sandwell & Co	1967	Ne	Pr,SH	2 Pk	BW	80	200	Sat	5	O	3
76	Hoffmann-LaRoche Inc	Belvidere, NJ	Wigton-Abbott Corp	1969	Ne	Pr,SH	1 Pk	CE	70	200	Sat	....	O	
77	General Foods Corp	Woburn, Mass		1967	Ex	Pr	1 Pk	CE	110	190	Sat	7 4	O	
78	Tennessee Paper Co	Chattanooga, Tenn	Weigel Engineering	1968	Ex	Pr	2 Pk	BW	100	185	Sat	....	O,G	
79	Libby, McNeill & Libby	Gridley, Calif		1968	Ex	Pr	1 Pk	MW	60	185	Sat	....	O,G	
80	Rexall Chemical Co	Joliet, Ill	Blaw-Knox Co	1968	Ex	Pr	1 Pk	BW	75	180	380	....	G	N
81	GMC	Warren, Mich	Argonaut Realty Co	1968	Ex	Pr,SH	1 Pk	CE	200	175	377	....	O,G	1
82	Pittsburgh Plate Glass Co	Lake Charles, La		1958	....	Pr	2 Pk	CE	100	175	Sat	....	G	N
83	The Columbia Mills, Inc	Minetto, NY	Burns Bros	1966	Ex	Pr,SH	1 Pk	CE	70	175	Sat	5.4	O,G	2.2
84	Hunt-Wesson Foods	Dandale, Calif		1968	Ex	Pr	1	BW	150	170	....	....	G	N
85	Northern States Power Co	Minneapolis, Minn	Pioneer Service & Engrg Co	1967	Ex	SH	1 Ft	RS	150	160	380	13.5	O,G	4
86	General Electric Co	Waterford, NY	United Engineers & Constructors Inc	1969	Ex	Pr,SH	1 Pk	BW	125	160	....	3	O	2.5
87	Dartmouth College	Hanover, NH	Jackson & Moreland	1968	Ex	SH	1 Pk	CE	70	160	470	....	O	
88	Phillip Carey Corp	Memphis, Tenn		1968	Ex	Pr	1 Pk	MW	35	160	Sat	....	G	N
89	General Mills Inc	Chicago, Ill		1968	Ex	Pr,SH	1 Pk	BW	60	160	Sat	5	O,G	
90	Vollrath Co	Sheboygan, Wis		1968	Ex	Pr,SH	2 Pk	MW	40	160	Sat	....	O,G	
91	Consolidated Paper Corp Ltd	Grand' Mere, Que, Can	H G Acres & Co, Ltd	1969	Ex	Pr,SH	1 Ft	FW	300	150	Sat	20	O,G	3
92	Logan International Airport	Boston, Mass	Francis Associates	1968	Ex	Pr,SH	1 Pk	KEE	100	150	Sat	10.7	O,G	2.25
93	Anheuser-Busch, Inc	Jacksonville, Fla	H K Ferguson Co	1969	Ne	Pr	3 Pk	BW	80	150	366	5.9	O	1.5
94	Allis-Chalmers Mfg Co	Springfield, Ill		1967	Ex	Pr,SH	1 Pk	CE	60	150	415	....	G	N
95	Hardolte Finishing Co	Taunton, Mass	Jensen & Associates, Inc	1968	Ex	Po,Pr	1 Ft	UR	60	150	Sat	6.1	O,G	
96	South Dakota state university	Brookings, SD	Ray L Roby & Associates	1968	Ex	SH	1 Ft	BW	55	150	Sat	7.1	O,G	3
97	Libby, McNeill & Libby	Sunnyvale, Calif		1968	Ex	Pr	1 Pk	MW	50	150	Sat	....	G	N
98	Fairfax County Hospital	Fairfax, Va	Henry Adams, Inc	1968	Ne	SH	2 Pk	BW	50	150	Sat	....	O,G	
99	Murphy Oil Co	Superior, Wis		1967	Ex	Pr	1 Pk	BRO	42	150	Sat	4.2	O,G	3
100	Rutgers University	New Brunswick, NJ	Paul C Gerringer & Associates	1968	Ex	SH	1 Pk	BW	4000	150	365	3 35	O	2.35
101	Caterpillar Tractor Co, Inc	York, Pa		1968	Ex	Pr	1 Pk	KEE	40	150	Sat	3.8	G	N
102	Humble Oil & Refining Co	Baton Rouge, La		1968	Ex	Pr	2 Pk	MW	38.5	150	Sat		G	
103	Swift & Co, Inc	Stockton, Calif	A G McKee Co	1968	Ne	Pr	2 Pk	MW	38.5	150	Sat	....	O,G	
104	National Bureau of Standards	Washington, D C		1968	....	Pr,SH	2 Pk	BW	30	150	Sat	...	O,G	
105	St Mary's Hospital	Duluth, Minn	Orr-Schelen-Mayeron & Assoc	1968	Ex	SH	3 Pk	BRO	20	150	Sat	3 8	O,G	
106	Bates Manufacturing Co	Lewiston, Me		1968	Ex	Pr	1 Pk	BW	120	135	Sat	8	O	
107	Huntington-Ingalls Div of	Huntington, W Va		1967	Ex	Pr,SH	1 Pk	CE	70	135	Sat	....	G	N
108	Monsanto Co	Muscatine, Iowa		1968		Pr,SH	1 Pk	BW	60	135	Sat	...	O,G	

MANUFACTURERS

B	Babcock & Wilcox Co
BAE	Babcock-Allen Engineering Co, Inc
BAT	Bahnson Air Temperature Div
BC	Bryan Boilers, Inc
BHW	Bryan Heat Exchanger Div
BMF	Bryan Manufacturing Co
BPE	The Bryan Steam Corp
BPD	Buffalo Pumps Inc, Heat Transfer Div
BT	Burnham Corp, Industrial Products Div
BT	Burnham Corp, Residential Products Div
BP	Byron Jackson Pump Div
BV	Byron Valve
BW	Babcock & Wilcox Co, Boiler Div
BW	Babcock & Wilcox Co, Refractories Div
C	Cleaver-Brooks
CA	Combustion Engineering, Inc
CB	Combustion Engineering-Raymond Div
CCC	Cochrane Div, Crane Co
CE	Crane Co
CEE	Cameron Engineering Corp
CFC	Combustion Equipment Co
CH	Chapman Engineering, Inc
CP	Chapman Brothers Pumps Inc
CT	Continental Boiler Works, Inc
CW	Clarage Fan Co
D	Detroit Stoker Co
DC	Dravo Corp, Industrial Products Div
DE	Detroit Edison Co
E	Erie City Iron Works
EA	Edwards Industrial Division, Dana Corp
EC	Electric Boiler Corp
EE	Edwards Engineering Corp
EJ	The Elliott Company
EPA	The Elliott Automotive Parts
FWE	Foster Wheeler Energy Corp
FC	Fisher Governor Co
FP	Fairbanks, Morse & Co, Pump Div
FT	Fulton Sylphon Div
FW	Foster Wheeler Corp
FWA	Foster Wheeler Corp, Atlantic Div
FWC	Foster Wheeler Corp, Connector Div
FWD	Foster Wheeler Corp, Development Div
FWE	Foster Wheeler Corp, Environmental Systems Div
FWP	Foster Wheeler Corp, Power Products Div
G	Gilbert Associates, Inc
GE	General Electric Co
GEA	General Electric Co, Apparatus Service Div
GEC	General Electric Co, Construction Materials Business Section
GEM	General Electric Co, Medium Steam Generator Section
GEP	General Electric Co, Power Generation & Industrial Turbine Business Section
GEV	General Electric Co, Vallecitos Atomic Laboratory
GP	Gorton Pump Co
GPC	Graver Water Conditioning Co, Div of Graver Tank & Mfg Co, Inc
GT	Graver Tank & Mfg Co, Inc
H	Honeywell Inc
HBL	Hagan Chemicals & Controls, Inc, Subsidiary of Hagan Corp
HBP	Hagan Chemicals & Controls, Inc, Subsidiary of Pittsburgh-Des Moines Steel Co
HC	Hagan Corp
HCC	Hagan Controls Div of Robertshaw-Fulton Controls Co
HEC	Hagan Electronics Co, Subsidiary of Westinghouse Electric Corp
HOP	Howden Projects
HW	James Howden Co
IBW	International Boiler Works Co
IP	Ingersoll-Rand Co
IR	Ingersoll-Rand Co
JE	John Zink Co
JEE	John Zink Co, Eclipse Fuels Engineering Div
JZ	John Zink Co
KEE	Keeler Co
KEE	A Kreisinger Engineering Corp
KL	Kewanee Boiler Corp
KMB	Kemp Manufacturing & Boiler Corp
KOB	Kohlenscheidungs Gesellschaft mbH
LC	Lake City Boiler Co
LF	Lee Filter Co
LP	Lochinvar Water Heater Co
MCE	Mechanical Equipment Co, Inc
MW	Murray Manufacturing Corp
NB	National Board of Boiler & Pressure Vessel Inspectors
NEB	New England Boiler Co
NP	Nash Engineering Co
OCE	Owens-Corning Fiberglas Corp, Engineered Products Div
PC	Parkson Corp
PE	Peerless Equipment Co
PP	Pacific Pumps Inc, Div of Dresser Industries, Inc
PPC	Pennsylvania Pump & Compressor Co
RAT	Turbines Rateau
RC	Research-Cottrell, Inc
RD	Republic Div, Rockwell Mfg Co
RDC	Rexnord Inc, Rex Chainbelt Inc
RS	Riley Stoker Corp
SEE	SEMAP, France
SEE	Svenska Flaktaktiebolaget
SH	Siemens & Halske AG
SHA	Schack Engineering Co
SON	Sonderegger-Ingham
SP	Superheater Boiler Co
SS	Stein & Roubaix SA
SSL	Sutter Steam Co
W	Westinghouse Electric Corp, Westinghouse Electric Corp
WC	Wallace & Tiernan Inc
WE	Weil-McLain Co
WS	Wood Stoves Corp, Wood Products Div
WSP	Worthington Corp, Worthington Pump & Machinery Corp, Steam Generator Division
WT	Wellman Engineering Co
WT	Wellman Tank Corp
WW	Wickes Boiler Co, Wickes Boiler Co, Div of Riley Stoker Corp
YW	Yarnall-Waring Co
ZE	Zurn Industries, Erie Div
ZEW	Zurn Industries, Erie Div, Wheelabrator Corp
ZW	Zurn Industries, Wheelabrator Corp
ZWE	Zurn Industries, Wheelabrator Corp, Erie Div
ZWW	Zurn Industries, Wheelabrator Corp, Wheelabrator Div
AE	Ames Engineering Corp
AEE	Ames Engineering Corp, Environmental Equipment Div
AEP	Ames Engineering Corp, Power Equipment Div
AHE	Ames Heating Equipment Co
AP	Ames Pump Co
APE	Ames Pump Co, Ames Pump Co, Div of Riley Stoker Corp
AW	Ames Water Heater Co
AWE	Ames Water Heater Co, Ames Water Heater Co, Div of Riley Stoker Corp
BW	Babcock & Wilcox Co
CBE	Combustion Engineering, Inc
CBP	Combustion Engineering, Inc, Power Systems Div
CBR	Combustion Engineering, Inc, Raymond Div
CE	Combustion Engineering, Inc
CEE	Combustion Engineering, Inc, Environmental Equipment Div
CEP	Combustion Engineering, Inc, Power Systems Div
CER	Combustion Engineering, Inc, Raymond Div
CH	Chapman Engineering, Inc
CP	Chapman Brothers Pumps Inc
CT	Continental Boiler Works, Inc
CW	Clarage Fan Co
D	Detroit Stoker Co
DC	Dravo Corp, Industrial Products Div
DE	Detroit Edison Co
E	Erie City Iron Works
EA	Edwards Industrial Division, Dana Corp
EC	Electric Boiler Corp
EE	Edwards Engineering Corp
EJ	The Elliott Company
EPA	The Elliott Automotive Parts
FWE	Foster Wheeler Energy Corp
FC	Fisher Governor Co
FP	Fairbanks, Morse & Co, Pump Div
FT	Fulton Sylphon Div
FW	Foster Wheeler Corp
FWA	Foster Wheeler Corp, Atlantic Div
FWC	Foster Wheeler Corp, Connector Div
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JEE	John Zink Co, Eclipse Fuels Engineering Div
JZ	John Zink Co
KEE	Keeler Co
KEE	A Kreisinger Engineering Corp
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RD	Republic Div, Rockwell Mfg Co
RDC	Rexnord Inc, Rex Chainbelt Inc
RS	Riley Stoker Corp
SEE	SEMAP, France
SEE	Svenska Flaktaktiebolaget
SH	Siemens & Halske AG
SHA	Schack Engineering Co
SON	Sonderegger-Ingham
SP	Superheater Boiler Co
SS	Stein & Roubaix SA
SSL	Sutter Steam Co
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WC	Wallace & Tiernan Inc
WE	Weil-McLain Co
WS	Wood Stoves Corp, Wood Products Div
WSP	Worthington Corp, Worthington Pump & Machinery Corp, Steam Generator Division
WT	Wellman Engineering Co
WT	Wellman Tank Corp
WW	Wickes Boiler Co, Wickes Boiler Co, Div of Riley Stoker Corp
YW	Yarnall-Waring Co
ZE	Zurn Industries, Erie Div
ZEW	Zurn Industries, Erie Div, Wheelabrator Corp
ZW	Zurn Industries, Wheelabrator Corp
ZWE	Zurn Industries, Wheelabrator Corp, Erie Div
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APE	Ames Pump Co, Ames Pump Co, Div of Riley Stoker Corp
AW	Ames Water Heater Co
AWE	Ames Water Heater Co, Ames Water Heater Co, Div of Riley Stoker Corp

tively few inject them into furnace

IPMENT			DUST		AIR HEATER		F-D FANS			I-D FANS			BOILER FEED SYSTEM				COMBUSTION CONTROL			PROJECT
Burner																				
No. per boiler	Manufacturer	Fuel additive	Dust collector type	Dust collector mfr.	Type	Manufacturer	No. per boiler	Manufacturer	Type drive	No. per boiler	Manufacturer	Type drive	No. of pumps	Manufacturer	Type drive	Feedwater treatment	Type	Control manufacturer	Chimney height, ft	
		N	N	N	N	N	1	CF	M	N	N	N	1	IR	M	Z,In	E	.	24	55
4	CE	N	N	N	N	N	1	...	T	...	.	T	1	.	T	Z	Co	BM,TIC	15	56
4	BW	N	N	N	N	N	1	CF	M	N	N	N	2	DHP	M,T	Z,Da,In	Co	BM	90	57
4 SA	TS	Fu	N	N	N	N	1	CF	M	N	N	N	2	IR	M	Z	E	CCI	...	58
4	CEC	N	Me	Bu	N	N	1	SW	T	1	SW	T	2	PE	M,T	In	Pn	F	80	59
4	BW	N	N	N	N	N	1	CF	M	N	N	N	2	GP	M,T	Z,Ir	Pn	BM		60
4 SA	COE	Fu	N	N	N	N	1	AE	M,T	N	N	N	1	IR	M	Z,In	Pn	BM,F	.	61
4 SA	CE	N	N	N	N	N	1	CF	M	N	N	N	39	WO	M,T	Z,In	Pn	.	...	62
4 SA	COE	N	N	N	N	N	1	FAA	M	N	N	N	1	WO	M,T	Z,In	Pn	...		63
4 SA	CE	N	N	N	N	N	1	AS	T	N	N	N	2	IR	T	Fl,Z,In	Pn	BM	30	64
4	COE	N	N	N	N	N	1	CF	M,T	N	N	N	2	IR,FRE	M,T	Z,In	Co	BM	55	65
4 SA	CE	Fu	N	N	N	N	1	BF	T	N	N	N	1	IR	M	Z,In	E	HAY	47	66
4 SA	PEC	N	Me	AC	Tu	UF	1	AS	M,T	1	AC	M,T	1	IR	M,T	Z	Pn	...	...	67
4	COE	N	N	N	N	N	1	COE	M	N	N	N	24	WO	M,T	Z,In	E	COE	58	68
4 SA	CE	N	N	N	Re	APC	1	....	M	N	N	N	2	BPC	M,T	Fl,Z,In	Pn	BM	140	69
4 SA	PEC	N	Me	AAF	Re	HOP	1	CBF	M	N	N	N	3	BW	M,T	Z,In	Pn[13]	BM	300	70
4 SA	PEC	N	...	...	N	N	1	CBF	M,T	N	N	N	2	WO	M,T	Z,In	Pn[13]	BM	200	71
4 SA	PEC	N	N	N	St,Re	APC	1	CHB	M,T	N	N	N	2	WO	M,T	So Fl,Z,In	Pn	...	200	72
4 SA	PEC	Bu	N	N	Re	APC	1	BF	M	N	N	N	2	GP	M	Z	E	HAY	150	73
4 SA	PEC	N	N	N	N	N	1	WE	M	N	N	N	2	WP1	M	In	Pn	BM	....	74
4 SA	BW	N	N	N	N	N	1	HOW	M	N	N	N	...	..	..	Fl,Z,In	..	....	....	75
4 SA	PEC	N	N	N	Re	APC	1	CF	M,T	N	N	N	....	....	..	Z,In	Pn	BM	55	76
4 SA	COE	N	N	N	N	N	1	FAA	M	N	N	N	1	DL	M	So,Z,In	Co	BM	....	77
4 SA	BW	N	N	N	N	N	1	....	M	N	N	N	1	GP	T	Ca Fl,Z	Pn	HCC	175	78
4 SA	COE	N	N	N	N	N	1	AL	M	N	N	N	1	IR	M	In	E	COE	..	79
4 SA	BW	N	N	N	N	N	1	CF	M	N	N	N	2	GP	M	MuO,In	E	ECA	50	80
4 SA	CE	N	N	N	Re	APC	1	WE	....	N	N	N	Ex	Ex	Ex	Z,In	Pn	BM	....	81
4 SA	CE	N	N	N	N	N	1	CF	M	N	N	N	39	APD	M	In	Pn	BM	40	82
4 SA	CE	N	N	N	N	N	1	CHB	M	N	N	N	3 Ex	WO,AC	M	Z,In	E	CCI	225	83
4 SA	BW	N	N	N	N	N	1	SW	M	..	.. .	....	1	IR	M	In	N	N	50	84
4 SA	...	N	Me	WP	N	N	1	AS	M	1	GF	T	Ex	Ex	M,T	Z,So MuO	Pn	BM	258	85
4 SA	BW	N	N	N	N	N	1	CF	M	N	N	N	2	WO	M,T	Fl,Z,In	Co	BM	100	86
4 SA	COE	N	N	N	Re	APC	1	FAA	M	N	N	N	1	WO	M	Z	Pn	HCC	....	87
4 SA	MW Z1	N	N	N	N	N	1	CF	M	N	N	N	Ex	....	....	.	E	CCI	....	88
4 SA	COE	Fu	N	N	N	N	1	AL	M	N	N	N	2	IR	M	Z	Pn	BM	125	89
4	COE	N	N	N	N	N	1	AL	M	N	N	N	2	....	M	Z,In	E	CCI	57	90
4	PEC	N	N	N	Re	HOP	1	WE	M	N	N	N	Ex	Ex	Ex	Ex	Pn[13]	....	....	91
4	PEC	Fu	Me	UOP	Re	APC	1	....	T	1	...	T	2	..	M,T	In	Pn	BM	....	92
4 SA	BW	N	N	N	N	N	1	CF	M	N	N	N	2	IR	M,T	Z	Pn	BM	53	93
4 SA	CE	N	N	N	N	N	1	....	M	N	N	N	1	AC	M	Z	Co	BM	40	94
4 SA	PEC	Fu	N	N	N	N	1	WE	M	N	N	N	2	IR	M	Z,In	Pn	BM	50	95
4 SA	WEB	N	Me	UOP	N	N	1	CF	M	1	CF	M	Ex	.	.. .	Z,In	Pn	BM	....	96
4 SA	COE	N	N	N	N	N	1	AL	M	N	N	N	1	COP	T	In	E	COE	...	97
4 SA	PEC	N	N	N	N	N	1	..	...	N	N	N	1	WO	M	Z	E	...	....	98
4 SA	COE	N	N	N	N	N	2	AL	M	N	N	N	3	....	M	Ex	...	...	....	99
4 SA	BW	N	Me	UOP	N	N	1	CF	M	N	N	N	1	WO	M	Z,In	Pn	BM	150	100
4	PEC	N	N	N	N	N	1	CF	M	N	N	N	Ex	Ex	Ex	Ex	Pn	BM	....	101
4	COE	N	N	N	N	N	2	AL	M	N	N	N	21	UP	M	Ex	E	COE	30	102
4 SA	COE	N	N	N	N	N	1	AL	M	N	N	N	...	...	...	Z	E	COE		103
4 SA	PEC	N	N	N	N	N	1	CF	M	N	N	N	3	WO	M,T	Z,In	Co	HCC,H,CCI	100	104
4 SA	COE	Fu	N	N	N	N	1	COE	M	N	N	N	2	IR	M,T	Z,Da,In	E	COE	140	105
4 SA	BW	N	N	N	N	N	1	CF	M	N	N	N	Ex	Ex	Ex	Z,Ir	Pn	BM	250	106
4	CE	W	N	N	N	N	1	...	M	N	N	N	....	...	....	Z,In	E	...	....	107
4 SA	COE	N	N	N	N	N	1	COE	M	N	N	N	2	IR	M	Z,In	Pn	COE	40	108

- ...ester Energy Sys. Mfg. and Assoc. Corp.
- ...ler Wheelabrator Corp.
- ...B Best Combustion Equipment Co.
- ...mption Corp.
- ...estern Precipitator
- ...ter of Joy Mfg. Co.
- ...ronan Fumes, Inc.
- ...ronson Fuel Mfg. Co.
- ...ation Zone Co.

...ELS

- ...ter Corp.
- ...ronautic Dept.
- ...ngasse
- ...ters
- ...Black liquor
- ...Ball mill
- ...Additive injected at burners
- ...Coal, bituminous
- ...Combination
- ...Chain grate
- ...Pneumatic and mechanical
- ...ig
- ...urnaces
- ...ulverizer
- ...Electrical precipitator
- ...Additive injected at economizer
- ...Electrostatic
- ...gas
- ...ower

- ...Evaporation
- ...Existing
- ...Field erected
- ...Fire tube boiler
- ...Forced circulation
- ...Additive in fuel in storage
- ...Gas
- ...Hydrogen
- ...Water
- ...Input make water
- ...Internal water treatment
- ...Limited
- ...Oil
- ...Multiclone
- ...Multistage demineralizer
- ...Multiclones demineralizer
- ...None
- ...Nitrogen deoxidizer
- ...Tank
- ...Other
- ...Pulverized coal
- ...Pulverizer
- ...Purifier
- ...Regenerative
- ...Rotary kiln
- ...Refuse wood burner

- Re - Regenerative
- SA - Steam-atomizing
- Sat - Saturated
- Sc - Sawdust
- SH - Space heating
- Sh - Shell and tube
- So - Sorbene
- SS - Spreader stoker
- St - Steel
- T - Turbine
- Ta - Tangential
- TC - Traveling-grate stoker
- Tu - Tubular
- TU - Closed circuit TV
- UF - Underfeed stoker
- UO - Utility oil
- VC - Vibrating-grate stoker
- WD - Wood
- WS - Wet scrubber
- Z - Zeolite

FOOTNOTES

- ... pumps in 3 boilers
- ... 4 pumps for 3 gas, furnace exit economizer exit
- ... 3 pumps in 2 boilers
- ... 4 pumps in 3 boilers
- ... Propane system

- ... Backup for coal
- ... Above two.
- ... Continuous ionization demineralizing
- ... Black liquor spray oscillator
- ... 2 pumps for 4 boilers
- ... 2 pumps for 5 boilers
- ... 2% excess air
- ... With Foster Wheeler economizer
- ... Refinery gas and light condensate
- ... Vertical glass tubes in bank
- ... 4 condensers after final
- ... mechanical drive turbocompressors
- ... Cooling with H_2 in turn water-cooled
- ... 3 pumps for 5 boilers
- ... STOP in future
- ... Pulverized coal and bark in future
- ... 5 G- 2 for wood
- ... 3 pumps for 6 boilers
- ... HTW system, nitrogen-pressurized
- ... Water 85 psig-225 F tank
- ... 3 pumps for 5 boilers
- ... HTW, steam-pressurized
- ... Also coke-oven gas
- ... 2 pumps for 4 boilers
- ... Steam dome tank
- ... HTW cascade installation

4 STEAM SYSTEMS

Table 3 135 psig and below

HTW, Overseas systems

When hourly production is b

PROJECT	COMPANY	LOCATION	CONSULTING ENGINEER	Date of initial operation	New or existing plant	Principal steam use	BOILERS						FUEL
							No. new units, type	Manufacturer	Capacity each, 1000 lb per hr or M Btu	Operating pressure, psig	Operating temp, F	Heating surface, 1000 sq ft, incl boiler, waterwall and superheater	Type
109	Hercules, Inc	Covington, Ga		1968	Ex	Pr	1 Pk	MW	25	135	Sat		O,G
110	Crompton-Shenandoah Co	Waynesboro, Va		1968	Ex	Pr	1 Pk	KEE	60	130	360	5.6	O,G
111	University of Delaware	Newark, Del	H L Stay & Assoc	1968	Ex	SH	1 Fi	CE	50	130	Sat		O
112	Florida State University	Tallahassee, Fla	Connel, Pierce, Garland & Friedman	1968	Ex	SH	1 Pk	BW	120	125	Sat		O,G
113	Goodyear Tire & Rubber Co	Akron, Ohio	Glaus, Pyle & Schomer	1967	Ex	Pr,SH	2 Pk	BW	100	125	450	6.1	O,G
114	National Brewing Co	Baltimore, Md	Egli & Gompf	1967	Ex	Pr	1 Fi	CE	90	125	353	8	G
115	F & M Schaefer Brewing Co	Brooklyn, NY	Harold H Friedman & Assoc	1967	Ex	Pr	1 Pk	CE	75	125	Sat	5.3	O
116	Aluminum Co of Canada Ltd	Kitimat, B C, Can	Acres Quebec, Ltd	1967	Ne	Pr,SH	1 Pk	BW	70	125	Sat	4.3	O
117	Sicks Rainer Brewing Co	Seattle, Wash	L Rustvold & R Kesinger	1968	Ex	Pr	1 Fi	CES	65	125	354	5.5	O,G
118	University of Arizona	Tucson, Ariz	Keller & Gannon	1967	Ex	SH	1 Pk	CE	54	125	Sat	7.1	G
119	Rensselaer Polytechnic Institute	Troy, NY		1968	Ex	SH	1 Pk	BW	50	125	353	4.4	O
120	Madison State Hospital	Madison, Ind	James T Lee & Assoc	1968	Ex	Po,SH	1 Fi	KEE	50	125	Sat	7	O
121	Blitz-Weinhard Co	Portland, Ore		1968	Ex	Pr,SH	1 Pk	CE	50	125	Sat	....	O,G
122	Aetna Life Insurance Co	Hartford, Conn		1963	Ex	SH	2 Fi	BW	40	125	Sat	....	O,G
123	Wolverine Worldwide, Inc	Muscatine, Iowa		1968	Ex	Pr	1 Pk	MW	40	125	Sat	....	G
124	St John's Hospital	Springfield, Ill	Berners, Schober & Kulp	1969	Ex	Pr,SH	2 Fi	CE	40	125	Sat	....	O,G
125	Abbott Laboratories	Rocky Mount, NC	A M Kinney, Inc	1968	Ne	Pr,SH	2 Pk	MW	40	125	Sat	4.9	O,G
126	Stanley Home Products, Inc	Easthampton, Mass		1968	Ex	SH	1 Pk	MW	35	125	Sat	....	O,G
127	Iowa Methodist Hospital	Des Moines, Iowa	Brooks-Borg & Skiles	1967	Ex	SH	2 Pk	MW	30	125	Sat	....	O,G
128	Travenol Laboratories	Hays, Kan	Howell-Stiggleman Co	1967	Ne	Pr	1 Pk	BW	30	125	350	3.6	O,G
129	Lima Memorial Hospital	Lima, Ohio	Terry P Smith, Inc	1968	Ex	SH	1 Pk	MW	27.5	125	Sat	....	O,G
130	Miles Laboratories, Inc	West Haven, Conn	A M Kinney, Inc	1968	Ne	Pr,SH	2 Pk	BW	26.5	125	353	3	O,G
131	Fancher Furniture Co	Salamanca, NY	John Rogers Co	1968	Ex	SH	1 Pk	MW	26	125	Sat	....	G,Wd
132	Holy Name Hospital	Teaneck, NJ		1968	Ex	SH	1 Pk	BW	24	120	Sat	2.7	O,G
133	Victoria General Hospital	Halifax, N S	Acres Atlantic, Ltd	1969	Ex	SH	1 Pk	FW	100	100	Sat	7.5	O
134	Creighton University	Omaha, Neb		1968	Ex	SH	1 Pk	BRO	60	100	Sat	5.2	O,G
135	White Bros Rose Corp	Medina, NY		1968	Ex	SH	1 Pk	UR	30	100	Sat	3.2	O
136	State Capital Building	Des Moines, Iowa	Moore & Bouse	1968	Ex	SH	1 Pk	MW	25	100	Sat	....	O,G
137	St John's Hospital	St Paul, Minn	D W Hickey & Co	1968	Ex	SH	1	BRO	17.5	100	Sat	1.55	O,G
138	Radford College	Radford, Va	Wiley & Wilson	1967	Ex	SH	3 Fi	KEE	40	90	Sat	4.3	O,G
	HIGH-TEMPERATURE WATER SYSTEMS												
139	U S Naval Academy	Annapolis, Md	W A Brown	1968	Ne	SH	3 Pk	1 BW	100[24]	400	440	13.4	O,G
140	Emhart Corp	Berlin, Conn	Ford, Bacon & Davis, Inc	1967	Ex	Pr,SH	2 Pk	1 BW	50[24]	400	400	5.1	O
141	Oakland University	Rochester, Mich	Migdal, Layne & Sachs	1967	Ex	SH	1 Pk	CE	32[27]	250	400	2.7	G
142	Central Plants, Inc	Los Angeles, Calif	Daniel, Mann, Johnson & Mendenhall	1966	Ne	SH	2 Pk	1 BW	30[24]	300	375	3.4	O,G
143	Dubois Chemicals Div, W R Grace & Co	Sharonville, Ohio	A M Kinney Co	1967	Ne	Pr,SH	2 Pk	1 BW	20[24]	250	300	2.1	O,G
144	White Plains Plaza	White Plains, NY	Slocum & Fuller	1967	Ne	SH	1 Pk	1 BW	10[24]	450	400	....	O
	OVERSEAS STEAM SYSTEMS												
145	Rheinische Olefinwerke	Wesseling, Germany		1967	Ne	Po,Pr	1 Pk	BW	220	2050	980	34	G
146	Esso AG	Karlsruhe, Germany	Ing Fichtner, Stuttgart	1967	Ne	Po,Pr	1 Fi	BW	242	1650	978	13.3	O,G[15]
147	B Rawe & Co	Neuhaorn, Germany	Ing Schumacher, Muenster	1967	Ex	Po,Pr	1 Fi	BW	100	1300	985	9.5	G
148	Heiz Kraftwerk Stuttgart GmbH	Stuttgart-Wangen, Germany		1968	Ex	Po,SH	1 Fi	KSG	275	1280	932	27.5	O
149	Esso Chimie	Port Jerome, France		1967	Ex	Po,Pr	1 Fi	SR	615	1220	932	59	O,G[15]
150	Cellulose Bilterud, SARL	Figueirada Foz, Portugal	Sandwell and Co, Ltd	1966	Ne	Pr	1 Fi	FW	110	1060	930	14	O
151	Cellulose Bilterud, SARL	Figueirada Foz, Portugal	Sandwell and Co, Ltd	1966	Ne	Pr	1 Fi	BW	157	1060	900	....	O
152	Parsons & Whittemore, Inc	Arauco, Chile	H A Simons Ltd	1969	Ne	Po,Pr	1 Fi	BW	340	650	750	....	C,O,Bk
153	Parsons & Whittemore, Inc	Arauco, Chile	H A Simons Ltd	1969	Ne	Po,Pr	1 Fi	BW	300	650	750	21	O,BL
154	Central Pulp Mills, Ltd	Fort Songad, India	Sandwell International Inc	1968	Ne	Po,Pr	1 Fi	BW	50	600	750	14	BL
155	Central Pulp Mills, Ltd	Fort Songad, India	Sandwell International Inc	1968	Ne	Po,Pr	1 Fi	BW	77	600	750	4.5	O
156	Alcan Jamaica Ltd	Kirkvine, Jamaica	H G Acres & Co, Ltd	1967	Ex	Po,Pr	1 Fi	BW	210	420	760	19.6	O
157	Union Sucrière de l'Arsne	Laon, France		1968	Ex	Po,Pr	1 Fi	SR	110	410	680	17	O
158	Shikrait Ltda	Lages, Brazil	Sandwell International Inc	1967	Ex	Pr	1 Fi	BW	27.6	350	675	4.6	BL
159	Union Laitière Cooperative	Toulouse, France		1969	Ne	Pr	1 Fi	BW	33	255	Sat	....	O
160	COPRINDUAG	Grasse, France		1968	Ex	Pr	1 Pk	BW	362	220	446	7.4	L

000 lb most boilers in U.S. are packaged type

EQUIPMENT: Burner: No. per boiler	Burner: Manufacturer	Fuel additive	DUST: Dust collector type	DUST: Dust collector mfr	AIR HEATER: Type	AIR HEATER: Manufacturer	F-D FANS: No. per boiler	F-D FANS: Manufacturer	F-D FANS: Type drive	I-D FANS: No. per boiler	I-D FANS: Manufacturer	I-D FANS: Type drive	BOILER FEED SYSTEM: No. of pumps	BOILER FEED SYSTEM: Manufacturer	BOILER FEED SYSTEM: Type drive	BOILER FEED SYSTEM: Feedwater treatment	COMBUSTION CONTROL: Type	COMBUSTION CONTROL: Control manufacturer	Chimney height, ft	PROJECT
SA	COE	N	N	N	N	N	1	AL	M	N	N	N	1	IR	T	Ex	E	COE	....	109
SA	TS	N	N	N	N	N	1	CF	M	N	N	N	2	DL	M,T	Z,In	Pn	HCC	160	110
SA	TS	Fu	N	N	N	N	1	CF	M,T	1	CF	M,T	3	FRE	T	In	Pn	BM	40	111
SA	BW	N	N	N	Re	APC	1	FAA	T	N	N	N	1	IR	M,T	Z,Da,In	E	HAY	...	112
SA	BW	N	N	N	N	N	1	.	M	N	N	N	2	IR	M	Sc,Z,In	Pn	BM	230	113
	PEC	N	N	N	N	N	1	CF	M	N	N	N	1	WO	T	Ft,Z,In	Pn	...	150	114
	PEC	N	N	N	N	N	1	FAA	M	N	N	N	Ex	Ex	Ex	In	Pn	HCC	....	115
SA	BW	N	N	N	N	N	1	CBF	M	N	N	N	2	CPL	M	Z,In	Pn[13]	BM	100	116
SA	CE	N	N	N	N	N	1	CHB	M	N	N	N	1	WPM	M	Z,In	Pn	BM	....	117
	TS	N	N	N	N	N	N	N	N	1	CF	M	1	IR	T	Z,In	Pn	ROC	....	118
SA	BW	Fu	N	N	N	N	1	CF	M	N	N	N	2	WO	M	Z,In	Pn	BM	118	119
	N	N	N	N	N	N	1	CHB	M	1	CHB	M	2	PE	M,T	Z,In	Co	HAY	150	120
	COE	N	N	N	N	N	N	N	N	N	N	N	2	GP	M	In	Co	....	....	121
SA	BW	Bur	N	N	N	N	1	....	M	N	N	N	1	....	M	In	Pn	RD	..	122
SA	COE	N	N	N	N	N	1	AL	M	N	N	N	1	GP	M	Z,In	Pn	RD	....	123
	CE	N	N	N	N	N	N	N	N	N	N	N	....	....	M	Z,In	E	CE	...	124
SA	COE	N	N	N	N	N	1	COE	M	N	N	N	1	WO	M,T	In	E	HCC	42	125
	.	Fu	N	N	N	N	1	L,W	M	N	N	N	2	WPI	M,T	In	Co	...	150	126
SA	COE	N	N	N	N	N	1	AL	M	N	N	N	2	IR	M	Z,In	E	COE	....	127
SA	BW	N	N	N	N	N	1	CF	M	N	N	N	2	COC	M	Ft,Z	Pn	BM	45	128
SA	PEC	N	N	N	N	N	1	CF	M	N	N	N	2	COC	M	Z,Ev	E	H	....	129
SA	COE	N	N	N	N	N	1	COE	M	N	N	N	1	WO	M	MuD,In	Pn	COE	30	130
	. .	N	N	N	N	N	1	CF	M	N	N	N	2	MR	M	In	E	H	80	131
SA	BW	Fu	N	N	N	N	1	CF	M	N	N	N	1	SHA	M	Z	Co	BM	146	132
SA	PEC	N	N	N	N	N	1	CBF	M,T	N	N	N	3	Ex	M,T	N	Pn	BM	....	133
	TS	N	N	N	N	N	N	N	N	N	N	N	2	APD	M	Z,In	E	....	135	134
SA	COE	N	N	N	N	N	N	N	N	N	N	N	2[24]	IR	M	Z,In	Co	....	50	135
SA	COE	N	N	N	N	N	1	AL	M	N	N	N	Ex	Ex	Ex	...	Pn	RD	....	136
	COE	N	N	N	N	N	1	AL	M	N	N	N	1	GP	M	N	E	COE	....	137
SA	COE	N	N	N	N	N	1	COE	M	N	N	N	2	PE	M,T	In	E	COE	....	138
AA	COE	N	N	N	N	N	1	AL	M	N	N	N	1	....	M	Z	E	HAY	....	139
RB	WNB	N	N	N	N	N	1	CHB	M	N	N	N	....	....	....	Z,In	E	BM	20	140
	PEC	N	N	N	N	N	1	CF	M	N	N	N	....	....	....	....	E	PEC	....	141
	IBW	N	N	N	N	N	1	1 BW	M	N	N	N	....	....	....	....	E	....	20[8]	142
AA	FLA	N	N	N	N	N	N	N	N	N	N	N	....	....	....	....	....	....	....	143
RB	WNB	Fu	N	N	N	N	1	TR	M	N	N	N	....	....	....	Z,In	E	CCI	....	144
	BW	N	N	N	St,Tu	BW	2	BW	T	2	BW	T	2	HAL	M,T	Ex	Co	SH	165	145
	SON	N	N	N	St,Re	BW	1	BW	M	N	N	N	2	HAL	M	Ex	....	....	485	146
	BW	N	....	....	St,Re	BW	1	BW	M	N	N	N	2	HAL	M	Ev,In	Co	SH	255	147
Be	KSG	N	N	N	Re	KL	1	BW	M	N	N	N	Ex[19]	KSB	M,T	MuD,In	E	JCE	328	148
2 SA,Ta	SR	N	N	N	Tu[16]	ECO	3	LP	M	N	N	N	2	KSB	M,T	MuD,In	E	BM	200	149
SA	PEC	N	N	N	Re	KL	1	SW	M	N	N	N	....[3]	KSB	M,T	MuD,In	Pn	F	145	150
SA	BW	N	E	SFF	St	...	1	SW	M	1	SW	M	....[3]	KSB	M,T	MuD,In	Pn	BM	180	151
	BW	N	Me	FAA	Tu	AS	1	....	M	1	....	M	[33]	...	....	MuD	....	....	....	152
1 BL	BW	N	E	....	St	...	1	....	M	1	....	T	[33]	....	....	MuD	....	....	...	153
SA,1[10]	BW	N	Me	BW	St	AMB	2	CF	M	1	CF	M	1	WO	M,T	Ca,Ft,MuD,In	Pn	BM	8[18]	154
SA	BW	N	N	N	N	N	1	CF	M	N	N	N	1	WO	M,T	Ca,Ft,MuD	Pn	BM	65[18]	155
SA	BW	N	...	....	Re	HOP	1	WE	M	N	N	N	Ex	....	....	Ex	Pn	BM	150	156
SA	SR	Bur,Eco	N	N	N	N	1	VEN	M	N	N	N	2	RAT	M	Ev,In	E	SH	100	157
	BW	N	WS	BW	St	AS	1	CF	M	1	CF	T	2[11]	WO	M,T	Ca,So,Z,In	N	N	34[18]	158
Be	PIL	N	N	N	N	N	1	...	...	N	N	N	2	KSB	M	So,Ev,In	E	....	40	159
	N	N	Me	GEN	N	N	2	VEN	M	1	VEN	M	1	SUL	M	Ca,So,Ft,Z,In	Co	SEF	....	160

- Engrg Div, Mechanic-Ross Corp
- Blowtemator Corp
- Best Combustion Equipment Co
- Corp
- Precipitator
- Jos Mfg Co
- Pumps Inc
- Pump Mfg Co
- Zink Co
- Ex - Evaporator
- Ex - Existing
- F - Field erected
- Fst - Field tube screen
- F - Forced draft
- Fu - Additive in fuel in storage
- G - Gas
- H - Hydrogen
- Ma - Male
- HW - High temp water
- M - Mechanical deaerating
- Mi - Mixed bed demineralizer
- MuD - Multi bed demineralizer
- N - None
- Ne - Nelson Co
- NG - Natural gas
- Oil - Oil
- Pul - Pulverized coal
- Pn - Packaged
- Pn - Pneumatic
- Pr - Power
- P - Processing
- Pss - Pressurized
- PB - Pulverized bubble
- Re - Regenerative
- SA - Steam-atomizing
- Sat - Saturated
- Sc - Sawdust
- SH - Scale hearing
- Sh - Shell and tube
- Sc - Sorbene
- SC - Screened slower
- St - Steam
- T - Turbine
- Ta - Tangential
- Tr - Traveling-grate stoker
- Tu - Tubular
- TC - Closed circuit TV
- U - Underfeed stoker
- Un - Unbalanced
- VS - Vibrating-grate stoker
- WF - Water
- WS - Wet scrubber
- Z - Zeolite

FOOTNOTES

- 2 pumps for 2 boilers
- Also uses refuse gas, furnace gas, coke-oven gas
- 3 pumps for 3 boilers
- Like #2 & 3 stoker
- Also CO gas and refinery gas
- F-W for existing system
- Dry backout for coal
- Above roof
- Continuous ion-exchange demineralizing
- Black liquor spray oscillator
- 2 pumps for 4 boilers
- 3 pumps for 5 boilers
- 3% excess air
- With Foster Wheeler economizer
- Refinery gas and light condensate
- Vertical glass tubes in bank
- Air condensers after final mechanical drive turbocompressors
- Cooling with Ni...m, titanium water-cooled
- 4 pumps for 5 boilers
- 1500 in future
- Pulverized coal and bark in future
- 1 SA, 2 hot water
- 2 pumps for 4 boilers
- HTW system - nitrogen-pressurized
- With de-aerating heater
- 3 pumps for 4 boilers
- HTW system-pressurized
- Also coke-oven gas
- 3 pumps for 4 boilers
- Steam cooled for a HTW cascade installation.