PLAINTIFF'S EXHIBIT
GE-109

POWER

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Modern Plant Handbook Issue

MODERN PLANT SURVEY 37
Tabulated data on over 400 steam and hydro plants on order or under construction, plus graphic summaries of current design trends

POWER'S MODERNIZATION PROGRAM 57
A collection of successful modernization ideas and announcement of award recipients

DIRECTORY FOR MODERNIZATION 97
The only power-field directory. Lists more than 700 products, supplies and services made and supplied by over 1460 companies

CROSSFILE OF OBSOLESCENCE 187
Former manufacturers of power-field equipment, matched with successor company's name and address plus parts availability

THE SHOWCASE 193
A review of important new products, new bulletins and cards for ordering more data

1954 Design Survey of Typical New

Compiled by S S Waldron, Assistant Editor

Company	Location	Plant name	Consulting engineers	First operation new units	Throttle pressure, psig	Steam temp, F		BOILERS					
						Throttle	Reheat	Number	Capacity, each, 1000 lb per hr	Manufacturer	Surface, 1000 sq ft: Boiler & WW	Superheater	Reheater
Cleveland Electric Illuminating Co	Eastlake, Ohio	Eastlake		11-55	2400	1050	1050	1	1500	CE	44.5	161.9	34.8
The Detroit Edison Co	River Rouge, Mich.	River Rouge		2-56	2050	1050	1000	1	1720	BW	—	137.5	46.4
	St. Clair, Mich.	St. Clair		11-56	2050	1050	1000	1	1710	CE	26.5[8]	—	—
				10-54	1850	1000	1000	1	1070	BW	21.7	61.2	46.7
Chicago District Electric Gen Co	Hammond, Ind.	State Line	Sargent & Lundy	1956	2000	1050	1050	1	1350	CE	65.3	145.0	27.5
The Toledo Edison Co	Maumee Bay, Ohio	Bay Shore	G W Saatheff	3-55	2000	1050	1000	1	950	BW	19.0	76.7	40.6
Wisconsin Electric Power Co	Milwaukee County, Wis.	Oak Creek		12-55	2000	1000	1000	1	300	CE	48.0	11.8	3.8
Commonwealth Edison Co	Joliet, Ill.	Will County	Sargent & Lundy	1955	1800	1050	1000	1	1200	BW	16.7	54.5	32.4
				1955	1800	1050	1000	1	1200	BW	16.7	54.5	32.4
Electric Energy Inc	Joppa, Ill.	Joppa[4]	Ebasco Services Inc	5-55	1800	1050	1000	1	1200	CE	52.3	100.9	15.8
				8-55	1800	1050	1000	1	1200	CE	52.3	100.9	15.8
Alabama Power Co	Gorgas, Ala.	Gorgas Plant No. 1	Southern Services Inc	5-56	1800	1000	1000	1	1150	CE	52.3	89.9	16.9
Southern California Edison Co	Redondo Beach, Calif.	Redondo No. 2[9]	Stone & Webster Engrg Corp	10-54	1800	1000	1000	1	1140	BW	20.1	80.0	24.5
	El Segundo, Calif.	El Segundo[10]	Stone & Webster Engrg Corp	7-55	1800	1000	1000	1	1140	BW	20.1	80.0	24.5
Pacific Gas and Electric Co	Morro Bay, Calif.	Morro Bay	Bechtel Corp	5-55	1800	1000	1000	1	1135	CE	21.5	79.0	28.8
				5-56	1800	1000	1000	1	1135	CE	21.5	79.0	28.8
[redacted] Light Co	[redacted]	[redacted]		1955	1800	1000	1000	1	1060	FW	18.9	—	—
	Elrama, Pa.	Elrama		9-54	1500	1000	1000	1	875	BW	29.7	49.6	15.5
Duke Power Co	Draper, N. C.	Dan River		1955	1800	1000	1000	1	1050	CE	46.4	72.9	17.1
Carolina Power & Light Co	Moncure, N. C.	Cape Fear	Ebasco Services Inc	7-56	1800	1000	1000	1	1900	CE	25.2	42.4	22.5
Pennsylvania Electric Co	Shawville, Pa.	Shawville[3,4]	Gilbert Associates Inc	1954	1800	1050	1000	2	894	BW	18.0	53.0	21.2
Northern Indiana Public Service Co	Gary, Ind.	Unnamed			1800	1000	1000	1	860	CE	15.0	65.5	8.4
Cincinnati Gas & Electric Co	nr New Richmond, Ohio	Walter C Beckjord[4]	Sargent & Lundy	10-54	1800	1000	1000	1	820	BW	16.2	50.9	40.4
Connecticut Light & Power Co	Devon, Conn.	Devon	United Engrs & Constructors	1955	1800	1000	1000	1	800	CE	—	—	—
Public Service Company of Indiana, Inc	nr Terre Haute, Ind.	Wabash	Sargent & Lundy	1956	1800	1000	1000	1	805	RS	18.2	78.3	21.1
[redacted]	[redacted]	[redacted]	[redacted]	6-53	1450	1000	—	1	900	FW	13.5	31.8	0
				4-55	1550	1000	1000	1	1000	RS	22.1	62.4	40.4
Public Service Company of Oklahoma	Tulsa, Okla.	Tulsa	Sargent & Lundy	2-56	1525	1000	—	1	830	BW	12.3	25.4	0.0
Gulf States Utilities Co	Beaumont, Tex.	Neches	Stone & Webster Engrg Corp	4-56	1525	1000	1000	1	700	CE	21.1	—	—
Kentucky Utilities Co		E W Brown		1956	1500	1000	1000	1	750	BW	5.0	—	—
Arkansas Power & Light Co	North Little Rock, Ark.	Cecil Lynch	Ebasco Services Inc	5-54	1450	1000	—	1	1200	BW	14.3	23.5	0
	Stamps, Ark.	Harvey Couch	Ebasco Services Inc	5-54	1450	1000	—	1	1200	BW	14.3	23.5	0
Texas Power & Light Co	nr Frisco, Tex.	Collin	Ebasco Services Inc	3-55	1450	1000	1000	1	1150	CE	43.8	51.2	15.1
	nr Bogata, Tex.	River Crest	Ebasco Services Inc	6-54	1450	1000	—	1	950	BW	11.3	20.0	0
Dallas Power & Light Co	Dallas, Tex.	Mt. Creek[4]	Ebasco Services Inc	1-56	1450	1000	—	1	1050	RS	31.5	42.0	0
		Parkdale[4]	Ebasco Services Inc	1-55	1450	1000	—	1	1050	BW	12.9	22.2	0
Public Service Co of Colorado	Denver, Colo.	Arapahoe	Ebasco Services Inc	7-55	1450	1000	—	1	930	BW	29.3	55.0	0
[redacted]	[redacted]	[redacted]	[redacted]	10-53	1450	1000	—	1	900	FW	13.5	31.8	0
				12-53	1450	1000	—	1	900	FW	13.5	31.8	0
Oklahoma Gas & Electric Co	nr Oklahoma City, Okla.	Mustang[4]	Sargent & Lundy	5-55	1450	1000	1000	1	800	BW	13.1	38.9	38.9
[redacted]	[redacted]	[redacted]	[redacted]	4-56	1450	1000	1000	1	853	FW	29.5	17.0	27.1
Kansas City Power & Light Co	Kansas City, Mo.	Hawthorn	Ebasco Services Inc	6-53	1450	1000	1000	1	750	CE	33.8	47.5	13.3
				6-55	1450	1000	1000	1	750	CE	33.8	47.5	13.3
Virginia Electric & Power Co	Dumfries, Va.	Possum Point	Stone & Webster Engrg Corp	5-55	1450	1000	1000	1	750	CE	31.7	49.8	14.0
Arizona Public Service Co	Undermined	Ocotillo	Ebasco Services Inc	3-57	1450	1000	1000	1	750	CE	24.3	30.4	21.3
Indianapolis Power & Light Co	nr Martinsville, Ind.	White River	Gibbs & Hill Inc	12-55	1450	1000	1000	1	750	CE	39.2	44.3	14.1
Illinois Power Co	nr Danville, Ill.	Vermilion	Sargent & Lundy	10-56	1450	1000	1000	1	740	CE	20.5	43.5	10.1
Florida Power Corp	Enterprise, Fla.	Turner		10-55	1450	1000	1000	1	500	BW	16.9	32.3	25.8
Ohio Edison Co	Lorain, Ohio	Edgewater	Commonwealth Associates Inc	5-57	1450	1000	1000	1	590	BW	9.2	—	—
Niagara Mohawk Power Corp	Buffalo, N. Y.	C R Huntley		1953	1450	1000	1000	1	556	BW	4.9	24.8	11.1
				1954	1450	1000	1000	1	556	BW	4.9	24.8	11.1
Florida Power & Light Co	East Palatka, Fla.	Palatka	Ebasco Services Inc	5-56	1450	1000	1000	1	550	CE	13.8	—	—
Central Illinois Public Service Co	Hutsonville, Ill.	Hutsonville	Sargent & Lundy	1-53	1450	1000	1000	1	525	CE	28.9	50.5	9.1
				5-54	1450	1000	1000	1	525	CE	28.9	50.5	9.1
New Orleans Public Service, Inc	New Orleans, La.	A B Paterson	Ebasco Services Inc	3-54	1250	950		1	375	BW	7.5	16.9	—
	New Orleans, La.	Michoud	Ebasco Services Inc	1957	1450	1000		1	975	PC	31.4		

AC – Allis-Chalmers Mfg Co
Ad – Admiralty
AdI – Admiralty, inhibited
AlB – Aluminum bronze
AlBr – Aluminum brass
AnAd – Antimony inhibited admiralty
AsAd – Arsenic inhibited admiralty
AsCu – Arsenical copper
B – Blast-furnace gas
Br – Brass
BW – Babcock & Wilcox Co
C – Coal, bituminous
CE – Combustion Engineering, Inc
Con – Condenser deaeration
CP – C A Parsons
Cy – Cyclone furnace
D – Damper
DB – Dry bottom
Du – Dual turbine and motor drive
EL – Elliot Co
FW – Foster Wheeler Corp
G – Natural gas
GE – General Electric Co
Hy – Hydraulic coupling
L – Lignite
Lo – Louvers
M – Motor drive
Ma – Magnetic coupling
Mo – Two motors per fan
MV – Metropolitan-Vickers Electrical Co, Ltd
O – Oil
P – Pulverized-coal fir
PAd – Phosphorous inhib admiralty
Pl – Plate
R – Regulator
Re – Regenerative
RS – Riley Stoker Corp
S – Speed control

1954 Design Survey: Typical Industrial

Compiled by H. P. Kallen, Assistant Editor

Company	Location	Consulting Engineers	First operation new units	Nominal pressure, psi	Nominal steam temperature, F	BOILERS: Number	BOILERS: Capacity, each, 1000 lb per hr	BOILERS: Manufacturer	BOILERS: Firing	TURBINES: Capacity, 1000 kw	TURBINES: Type	TURBINES: Manufacturer	TURBINES: Backpressure, psia	TURBINES: No. of bleed or auto-extraction pts	Total boiler capacity, incl new units, 1000 lb	Total generator capacity, incl new units, 1000 kw
200 TO 300 PSI																
Canada Paper Co	Windsor Mills, Que.		2-55	300	450	1	175	RS	P,O						140	
Pepperell Mfg Co	Pepperell, Ala.		3-54	280	Sat	1	90	BW	G							
Lion Oil Co, Chemical Div	El Dorado, Ark.	Chemical Constr Corp		275	540	4	100	BW	G						518.6	19.8
American Locomotive Co	Schenectady, N.Y.	Stone & Webster Engrg Corp	1-55	265	550	3	300	BW	SS (196)	5.0		EI	5		420	8.0
US Army	Whittier, Alaska	Bechtel Corp	4-55	265	600	1	40		O	2.0	AE,Co		2[4]	1	160	6.0
Ames Textile	Cleveland, Ga.			254	Sat	1	3.0	CE	O,PF						3.0	
B & W Co, Tubular Prods Div	Beaver Falls, Pa.		4-53	250	405	2	40	BW	TG							
[redacted]	[redacted]	[redacted]	1954	250	500	2	80	FW	O,G							
[redacted]	[redacted]	[redacted]	3-52	250	500	2	75	BW	P[1]							
Ford Motor Co	Dearborn, Mich.	Kuljian Corp	5-54	250	650	3	900	CE	P[2]						6000	330
General Box Co	Louisville, Ky.		1953	250	Sat	2	25	Vo	O,G,WW							
Hockmeyer Bros Inc	Lowell, Mass.	Cotton, Pierce & Streander		250	Sat	1	30	CE	O						100	
Hyatt Brgs Div GMC	Harrison, N.J.			250		2	30	BW	O						40	
Omar Inc	Indianapolis, Ind.		6-53	250	334	1	20.3	BW	O							
State Hospital	Morganton, N.C.	Wiley & Wilson	52&54	250	506	2	35	EC	SS	0.5	Co	WE	5		120	5.0
						2	25	EM								
Syracuse Ornamental Co	Syracuse, N.Y.		12-53	250	338	1	7	BW	O,G						10	
Texas Co	El Paso, Texas	R.R. Popham	10-54	250	500	3	100	EC	O,G						300	
	Tulsa, Okla.		9-54	250	500	1	120	BW	O,G						450	
Wakefield Co	Kewanee, Ill.		6-53	250	500	2	25		G	2-2.8	AE,Co	GE		1	172	5.6
Whitaker Metals	N. Kansas City, Mo.		6-54	250	401	1	30	CE	G						14	
Danvers State Hospital	Hathorne, Mass.		10-54	235	401	3	25	IB	O	2-0.6		Mo	30		60	1.2
M & M Woodworking	Lyons, Ore.	C.C. Moore	1953	235	400	2	13.5	BW	O						27.2	
Albemarle Paper Mfg Co	Richmond, Va.		1-55	225	Sat	1	30	CE	O						30	
Anaconda Wire & Cable Co	Sycamore, Ill.		10-54	225	Sat	1	10	BW	O,G						20	
Harris County Courthouse	Houston, Texas	I.A. Naman	6-53	225	498	3	14	UI	G						42	
General Electric Co	Rome, Ga.	Robert & Co	10-54	220	Sat	3	30	BW	O,G						90	
Firestone Tire & Rubber Co	Des Moines, Iowa		3-54	210	Sat	1	75	BW	O,G						160	
Firestone Tire & Rubber Co	Hamilton, Ont.		5-54	210	Sat	2	65	BWG	SS (113)						130	
Anglo Fibrics Co Inc	Webster, Mass.			200	Sat	2	17.5	CB	O							
Anheuser-Busch Inc	Van Nuys, Calif.	Holmes & Narver	3-54	200	Sat	3	44	BW	O,G						150	
[redacted]	[redacted]	[redacted]	4-55	200	450	1	175	FW	P						310	
Chevrolet-Muncie Div GMC	Muncie, Ind.	H.E. Bevster	10-54	200	Sat	2	50	BW	TG						250	
						2	75	UI	SS							
Claremont College	Claremont, Calif.			200		1	45	BW	O,G						91	
						1	36	EC								
Firestone Tire & Rubber Co	Pottstown, Pa.	Day & Zimmermann Inc	1-54	200	Sat	1	100	BW	O,P						316	
General Electric Co	Appliance Park, Ky.	Albert Kahn	12-52	200	430	2	150	RS	TG (264)						450	
						1		Vo								
General Electric Co	Evendale, Ohio	Jackson & Moreland	10-54	200	388	2	85		P						170	
Hope Webbing Co	Pawtucket, R.I.		7-54	200	Sat	3	25	BW	O	2-1.75	AE	WE		1	50	1.5
Maytag Co	Newton, Iowa		6-53	200	418	1	50	BW	SS						250	
Orangeburg Mfg Co Inc	Newark, Calif.	Austin Co		200	389	1	20	CE	O,G	0.2		Mo	15			
Pasco Packing Co	Dade City, Fla.		3-54	200	Sat	1	150	BW	O	2-1.5	Co	GE	2[4]		360	3.0
RCA Tube Div	Harrison, N.J.		11-54	200	515	1	25	CE	TG (115)	0.5	NC	GE			65	0.5
US Navy	Whidbey Island, Wash.	Frasier Co	8-54	200	387	2	34	EC	O						98	
150 TO 199 PSI																
General Motors Corp	Arlington, Texas			190	384	3	60	BW	O,G						180	
[redacted]	[redacted]		12-53	180	Sat	1	20	FW	WW,SS (68)						50	1.0
Univ of Virginia	Charlottesville, Va.	Wiley & Wilson	12-53	180	Sat	2	50	UI	TG						160	
						4	15	Vo								
Canadian Nat'l Railways	St. John, N.B.		11-53	175	Sat	1	225	CV	SS (120)						28.5	
						1	65	EL	SS (48)							
Chemprotan Carbon Co	Trenton, N.J.		1954	175	480	1	46	UI	SS (115)	0.4	NC	Mo	18		120	0.4
[redacted]	[redacted]		6-54	175	Sat	1	30	FW	G						30	
Esso Standard Oil Co Inc	Bayonne, N.J.	Day & Zimmermann Inc	3-54	175	475	2	300	FW	O,PF						600	
Ford Motor Co	Dearborn, Mich.	Kuljian Corp	4-54	175	450	1	40		WH						200	
International Refineries Inc	Krenspark, Minn.	Cummus Co	4-53	175	525	2	60	CE	O,G						120	
Limestone Ammonia Base	Limestone, Me.	Guy B. Panero	1952	175	378	4	52.5	Vo	SS						250	
Newport Industries	Pensacola, Fla.		10-54	175	Sat	1	20	BW	O,PF						20	
Tee-Pak Inc	Kalamazoo, Mich.	Austin Co	1-52	175	377	1	60	UI	TG (128)						240	
[redacted]	[redacted]	[redacted]	1-53	175	Sat	1	10	FW	O,PF						5	
[redacted]	[redacted]	[redacted]	1-54	170	368	2	200	FW	O,PF						40	
Division Chemical Div W.R. Grace & Co	Lake Charles, La.	J.P. O'Connel		165	373	2	45	UI	G						80	
Farmers Union Cent Exch Inc	Laurel, Montana	Ebasco Services Inc	12-54	165	372	1	25	Vo	O						213	
S.D. Johnson & Son Inc	Racine, Wis.	C.R. Lewis & Assoc.	10-54	165		2	225	UI	TG						74	
						1	600	BW								
Massachusetts Chemical Corp	Acton Div., Mass.	Stamler Co	2-54	165	Sat	1	40	BW	WH,G							
Syracuse Lace Co	Syracuse, N.Y.			160		1	60	BW	SS							
New Braunfels Power Co	San Antonio, Texas	Kuljian Corp	1953	160	366	2	50	Vo	G						100	
International Nickel Co	Huntington, W. Va.		6-53	160	450	1	75	BW	G,WH,PF						115	
Jefferson Lake Sulphur Co	Lake Point, Texas		1953	160	353	1	45	BW	G	1.0		GE			120	1.0
Kayser Inc	Westover, N.C.			160	355	1	22	UI	SS (56)						16	
Laguna Honda Hospital	San Francisco, Calif.		6-54	160	370	2	52	BI	O,G	2.0	Co	DL	5		104	0.5
										3.0	Co	DL				
MacMillan Bloedel Ltd	Harmac, B.C.	H.A. Simons Ltd	8-54	160	370	1	300	CE	SS (207)						300	3.8
						2	150									
National Dew Tail Corp	[redacted]			160	250	1	25	BWG	UF (80)						100	
Oregon Pulp & Paper Co	Salem, Ore.	C.C. Moore	10-52	160	370	1	150	BW	SS 1001							
St. Lawrence Corp	East Angus, Que.	E. & B. Cowan	1953	160	465	1	100	BW	P						200	

AC – Allentown-Caloric Mfg Co
AE – Allis-Chalmers Mfg Co
B – Babcock
Bi – Bigelow Co
BW – Babcock & Wilcox Co
BWG – Babcock & Wilcox Stirling McCormick
C – Coen Co Inc
CB – Combustion Engineering Inc
CE – Combustion Engineering Inc
CO – Connelly Inc
CV – Canadian Vickers Ltd
DBr – Dominion Bridge Co Ltd
DL – De Laval Steam Turbine Co
E – Erie City Iron Works
EC – Edge Moor Iron Works Inc
EI – Elliott Co
EL – E. Leonard & Sons
EM – Edge Moor Iron Works Inc
FW – Foster Wheeler Corp
G – Gas
GE – General Electric Co
HF – Hogged fuel
IB – International Boiler Works Co
JI – John Inglis Co, Ltd
Ke – E. Keeler Co
KR – Kewanee-Ross Corp
MI – Murray Iron Works Co
Mo – Moore Steam Turbine Corp
NC – Non-condensing
O – Oil

Institutional Plants, 300 PSI and Below

Compiled by H. P. Kallen, Assistant Editor

Company	Location	Consulting Engineers	First operation new units	Nominal pressure, psi	Nominal steam temperature, F	BOILERS: Number	BOILERS: Capacity, each, 1000 lb per hr	BOILERS: Manufacturer	BOILERS: Firing	TURBINES: Capacity, 1000 kw	TURBINES: Type	TURBINES: Manufacturer	TURBINES: Backpressure, psia	TURBINES: No. of bleed or auto-extraction pts	Total boiler capacity incl new units, 1000 lb	Total generator capacity incl new units, 1000 kw
Westinghouse Electric Corp	Raleigh, N.C.	Robert & Co		160	Sat	2	25	BW	O,G						50	
Childrens' Hospital	San Francisco, Calif.	Keller & Ganner	2-54	155	368	2	33	EC	O,G	0.2		MI	5		66	0.2
Rayalite Products Ltd	Kamloops, B.C.	Cariboo Engrg Ltd	5-54	155	368	2	25	FW	O,G[3]						50	
Monsanto Co of America	Texas City, Texas		5-52	150	365	2	30	FW	O						60	
American Thread Co	Sevier, N.C.	J.E. Sirrine Co	9-52	150		2	40	CE	SS						80	
Ark Fuel Oil Corp	Greggton, Texas		12-53	150	365	3	30	BW	G						90	
Atlantic Creosoting Co Inc	Savannah, Ga.			150	Sat	2	20	BW	G,B							
Calcasieu Paper Co	Elizabeth, La.		12-53	150	450					3.2	Co	AC	2[4]			3.2
Cameron Iron Works Inc	Houston, Texas	Lockwood & Andrews	7-54	150	Sat	2	35	RS	G						70	
Canadian Pacific Ry Co	Banff Springs, Alberta		5-54	150	366	2	15	DBr	O,G						30	
College of William & Mary	Williamsburg, Va.		10-53	150	366	3	26	BW	O						78	
Continental Can Co Inc	Mt. Vernon, Ohio	Austin Co	1-53	150	366	1	40	BW	TG (88)						85	
Delco-Remy Div. GMC	Anderson, Ind.		11-54	150	365	3	80	Sp	SS						440	
						2	100									
Diamond Match Co	Superior, Montana		7-53	150	Sat	1	30	RS	SS,HF,Sa							
[redacted]	[redacted]		10-54	150	450	1	35	FW	SS (108)						80	
			1-54	150	Sat	1	30	FW	O						30	
			2-54	150	Sat	1	30	CE	O							
Ford Motor Co.	Pompton Lakes, N.J.		11-54	150	360	3	17.3	CB	G						51.8	
	Minoritas, Calif.	Hall Labs				2	50									
Ga Inst of Technology	Atlanta, Ga.	Robert & Co	7-54	150	Sat	1	60	BW	O,G						175	
						1	16									
G C & S F Railway Co	Sweetwater, Texas		4-53	150		1	5.2	CB	G							
Johns Hopkins Univ	Baltimore, Md.	Egli & Gompf	8-54	150	Sat	1	50	BW		3-25	NC		20		100	0.8
Kerr Bleaching & Finishing Works	Concord, N.C.		9-53	150	Sat	1	60	BW	SS (200)						120	
Marion Ind Div. Motor Products Corp	Marion, Ohio	Austin Co	1-54	150	212	1	17	CB	O,G						34	
R.O. Martin Lumber Co	Alexandria, Va.	A.M. Lockett & Co	3-54	150	Sat	1	30	BW	SS (93)						80	
Memorial Hospital	Mattoon, Ill.		6-54	150	240	2	7	CB	O,G							
Michael Reese Hospital	Chicago, Ill.	P. Haddis	11-54	150	365	3	70	Wi	O						170	
Murray Corp of America	Ecorse, Mich.	Boddy, Benjamin & Woodhouse Inc	10-54	150	Sat	1	50	Wi	SS (98)						65	
National Distillers Prods Corp	Memphis, Tenn.		7-53	150		2	8.8	CB	G,O						17.5	
Norwich Pharmacal Co	Norwich, N.Y.	Wigton-Abbott	12-52	150		1	15	Con	P							
						1	19	Ke	O							
[redacted]vron Packing Co	El Paso, Texas	Stearns-Rodgers Co	6-54	150		1	18	BW	G							
[redacted]alston Purina Co	Stockton, Calif.		1954	150	Sat	2	5.2	CB	O,G							
	Woodstock, Ont.		5-54	150	Sat	1	10	CB	O						14	
Rose Polytechnic Inst	Terre Haute, Ind.			150	Sat	1	15	Vo	TG						15	
Royal Canadian Navy Supply Depot	Ville La Salle, Que.	Rankin Co Ltd	12-52	150	353	2	13.7	CV	O,SS (120)							
St Elizabeth Hospital	Lincoln, Neb.	Leonard Tomlyn	6-54	150	370	1	5.2	WB	O,G						24.5	
						2	7.7	Vo								
St Maurice Chemicals Ltd	Varennes, Que.		5-53	150		2	20	JI	O						40	
Seaside Memorial Hospital	Long Beach, Calif.	Thompson Engrg	5-54	150	338	2	5.2	CB	O,G						15.6	
Southern Cotton Oil Co	Savannah, Ga.		6-54	150	366	1	30	CE	O						100	
Urania Lumber Co	Urania, La.		5-54	150	400	1	35	BW	WW,G	1.5	AE	GE	4[4]		73	2.5
						1	22									
						1	16									
Vanadium Alloys Steel of Can Ltd	London, Ont.	M.M. Dillon & Co	4-54	150	366	2	18	DBr	UF (72)						36	
Waterfalls Tissue Corp	Mechanic Falls, Me.		4-54	150	Sat	1	30	CE	O,PF						30	
Western Electric Co Inc	Tonawanda, N.Y.		4-54	150	365	1	25	RS	P						175	
Westinghouse Electric Corp	Vicksburg, Miss.	Kaiser Engrs	12-53	150	358	2	9.9	Wi	G,P,F						19.8	
149 PSI AND BELOW																
Corning Glass Works	Corning, N.Y.	St. John, Platt & Carlson	11-54	145	400	1	60	RS	SS (133)						120	
Finch Pruyn & Co Inc	Glens Falls, N.Y.	Chas T. Main Inc	1-54	145	Sat	1	57.5	CE	SS (150)						152	
Foote Mineral Co.	Sunbright, Va.	Albert C. Wood Assoc	1-55	145	Sat	1	60	Vo	SS						110	
South Wisconsin Colony	Union Grove, Wis.			145	465	2	20	UI	UF						64	0.2
						2	12									
Allegheny Ludlum Steel Corp	W. Leechburg, Pa.	Day & Zimmermann Inc	3-54	140	435	1	50	CE	SS						110	
Monarch Rubber Co	Hartville, Ohio	Joe Bresteve	11-53	140	Sat	1	22.5	BW	SS						42.5	
US Veterans Admin Center	Los Angeles, Calif.			140	360	4	60	UI	C,G						210	
Akron Tower Supply Co	Akron, Ohio	Beiswanger & Hoch	9-54	135	Sat	1	30	BW	SS						45	0.1
American Snuff Co	Springfield, Tenn.	Wilson-Weesner Wilkinson Co	12-54	135	Sat	2	8.6	CB	O,C							
Clemson Agricultural College	Clemson, S.C.	J.E. Sirrine Co	9-54	135	350	1	35	BW	SS (90)						105	
Dominion Rubber Co Ltd	Kitchener, Ont.		9-53	135	358	2	16	VK	O						48	
Reichhold Chemicals Inc	Ballard Vale, Mass.		11-53	135	350	1	17.5	CB	O						17.5	
[redacted]	[redacted]			135	356	1	12	FW	SS (37)						30	0.8
Crosley Div. Avco Mfg Co	Evendale, Ohio	Fosdick & Hilmer	2-53	130	350	2	37.5	BW	UF (101)						84	
Air Force Cambridge Research Center	Bedford, Mass.	Coolidge, Shepley, Bulfinch & Abbott	1-54	125	350	3	53		O						159	
Alden Rug Mills Inc	Lenni, Pa.		10-53	125	350	1	26	BW	O						41	
Alnee Wood Products Ltd	Montreal, Que.	A.G. Moore	9-52	125	275	2	6.9	CB	O						13.8	
Alrexon Co of Agoco	Rockdale, Texas		9-52	125	Sat	2	30	FW	G						60	
American Brass Co.	Buffalo, N.Y.	Anaconda Copper		125	416	3	25	PS	UF						75	
American-Marietta Co	Seattle, Wash.		8-54	125		1	10	CB	O						29	
Ark Tuberculosis Sanatorium	Booneville, Ark.	Max A. Mendourge		125		4	8	Vo	O,G							
Black & Decker Mfg Co	Hampstead, Md.	Austin Co	12-53	125	360	1	28	BW	G						36	
Borton Chemical Co	Chester, Pa.			125	Sat	2	16	CB	O						32	
Capin Crafts Inc	Dalton, Ga.	Robert & Co	4-54	125	Sat	1	30	CE	O						46	
Calif State Polytechnic Inst	San Luis Obispo, Calif.		6-54	125	352	2	20	EC	O,G						40	
Calif Youth Authority	Paso Robles, Calif.	S. Smyth	1-54	125		2	12.5	BW	O							
Chateau Lake Louise, Ltd	Lake Louise, Alberta		6-54	125	353	2	12	JI	O						24	

P – Pulverized fuel firing
PF – Pressurized furnace
PU – Preferred Utilities Mfg Corp
RS – Riley Stoker Corp
Sa – Sawdust shavings
Sp – Springfield Boiler Co

SS – Spreader stoker
Str – Strutmers Wells Corp
TG – Traveling-grate stoker
UF – Underfeed stoker
UI – Union Iron Works
Vo – Henry Vogt Machine Co

VK – Vickers Keeler
WB – Wm Bros Boiler & Mfg Co
WE – Westinghouse Electric Corp
WH – Waste heat
Wi – Wickes Boiler Co
Wo – Worthington Corp

Ww – Wood waste
(1)(2)(3) – Stoker grate area, sq ft
1 – Also fires blast-furnace gas
2 – Also fires blast-furnace and coke-oven gas

3 – Refinery gas
4 – In. Hg absolute
5 – Future

team Central-Station Installations

Heat rate per cu ft, s	Furnace bottom	Economizer surface per boiler, 1000 sq ft	Air heater surface per boiler 1000 sq ft	Air heater type	F-D FANS: Drive	F-D FANS: Air-flow control	I-D FANS: Drive	I-D FANS: Gas flow control	Firing	FUEL: Type	FUEL: Heating value, 1000 Btu per lb	FUEL: Ash softening temperature, F	FEED PUMPS: Drive	FEED PUMPS: Flow control	TURBINES: Number	TURBINES: Capability, 1000 kw	TURBINES: Manufacturer	TURBINES: Backpressure, psia	TURBINES: No. bleed points	Full-load deaerator pressure, psia	CONDENSERS: Surface, 1000 sq ft	CONDENSERS: No. water passes	CONDENSERS: Tube material	Total boiler capacity incl new units, 1000 lb	Total generator capability incl new units, 1000 kw
18.5	DB	32.8	151.4	Re	M	D,V	M	D Hy	P,C [17]	C,G [17]	12.5		2 M	Hy	1	66 [6]	WE	1.25	5	73	45	2	Ad	520	66
18.5	DB	23.2	170.4	Re	M	D,V	M	D,V	P,G,O [18]	C,G,O [18]	12.5	2100	2 M	Hy	1	100 [6]	GE	1.25	5	98	50	1	Ad	1995	241
22.5				Re,Pl	M	V	M [1]	[1]	O	O	18.2		3 M	R	1	66 [6]	AC	1.25	5	66	60	2	Al B	2115	211
18.3	DB	33.2	197.7	Tu	M	D,V	M	D,V	C,O,P [16]	G,O,C [16]		2000	3 M		1	66 [6]	GE	1.25	5		55	2	Ad1	1243	116
16.4	DB	21.6	70.2	Re	M	V	M	Hy	P,O	C,O	13.4	2150	3 M	Hy	1	70 [6]	GE	0.75	5		45	2	Ad1	650	70
23.3		13.0	89.2	Re	M	V	[1]	[1]	C,O	G,O	1030 [5]		2 M	R	1	44 [6]	GE	0.95	5	51	37.5	2	Ad1	--	
20.5	DB	9.5	37.3	Re	V	D	M	Ma	P,O	C,O	18.7		2 M	R	1	44 [6]	WE	0.75	5	67	27.5	2	Al Br	700	97
20.5	DB	9.5	37.3	Re	M	D	M [1]	Ma [1]	P,O	C,O	18.7		2 M	R	1	44 [6]	WE	0.75	5	67	27.5	2	Al Br	1125	147
					M	V	[1]	[1]	O,C	O,G	18.4		2 M	R	1	30		1.0	5		--			1180	111
27.5			66.3	Re	M	V	[1]	[1]	G	G	10505		3 M	R	1	75	GE	0.75	5	80	60	2	AsCu	1550	180
32.0	--	-	421.3	Pl	M	V	[1]	[1]	G,O	G,O	974 [5]		2 M	R	1	33 [6]	GE	1.25	4	77	25	2	Ad	1410	145
31.2			58.6	Tu	M	V		D	G,O	G,O	1000 5		2 M		1	33 [6]	GE	0.75	4	100	30	2	AsAc	804	66
36.4			93.3	Tu	Mp	V	[1]	[1]	G	G	10005		2 M	Hy	1	33 [6]	WE	0.75	4	40	30	2	-		
22.0	DB	3.3	30.0	Tu	M	D	M	D	SS(481)	L	6.6 [5]	2080	2 M	R	1	25	GE	1.75	4	100	16	2	St	275	25
									G	G	1090														
18.8	DB	0	58.4	Re	M	V	M	D Hy	G	G	1030 [5]	-	1 M	R	1	25	WE	0.5	4	40	22.5	2	Ad1	1055	110
					M	D	M	D	G,O	G,O			1 M		1	20 [6]	GE	1.25	4		15	1	....	360	38
18.7		7.3	13.5	Tu	M	V	M	Hy	SS-380)	C	9.2	900	2 M,1 T	R	2	24 [6]	WE	0.75	4	75	18	2	Ad	352	48
															1	24 [6]	WE	0.75	4	75	18	2	Ad	512	72
29.8			14.9		Mp	V	Mp [1]	D [1]	SS 2901	C	10.3	2000	2 M	R	1	16.5	GE	0.75	4	24	13	2	Ad	178	18
34.9			10.9	Tu	M	V			O	O	18.5		2 M	-	1	12.7 [6]	EL	0.75	4	65	11	2	Ad	225	22
16.1	DB	25.8	228.8	Re	M	V	M	V	P	C	12.9	2250	3 M	Hy	2	200	GE	1.0	8	100	75	1	Ad1	2820	400
16.1	DB	25.8	228.8	Re	M	V	M	V	P	C	12.9	2250	3 M	Hy	1	200	GE	1.0	8	100	75	1	Ad1	4230	600
14.5	DB	26.0	162.8	Re	M	V	M	V	P	C	11.5	1950	3 M	Hy	4	150	WE	1.0	7	80	60	1	Ad1	4400	600
	DB	25.8	229.8	Re	M	V	M	V	P	C	11.5	1950	3 M	Hy	4	200	GE	1.0	8	100	80	1	Ad1	10040	1400
	DB	25.8	228.8	Re	M	V	M	V	P	C	11.5	1950	3 M	Hy	1	200	GE	1.0	8	100	80	1	Ad1	11450	1600
	DB	42.5	242.7	Re	M	V	M	V	P	C	11.2	1950	3 M	Hy	2	250	WE	1.0	8	110	95	1	Ad1	3560	500
19.5	DB	0	252.0	Re	M	V	M	V	P	C	11.5	1950	3 M	Hy	4	200	GE	1.0	8	100	95	1	Ad1	5640	800
18.6	DB	0	237.0	Re	M	V	M	V	P	C	11.5	1950	3 M	Hy	10	150	WE	1.0	7	80	70	1	Ad1	11000	1500
21.5	DB	25.3	197.6	Re	M	V	M	V	P	C	11.5	1950	3 M	Hy	4	125	GE	1.0	6	67	70	1	Ad1	4400	500
21.4	DB	0	157.0	Re	M	V	M	V	P	C	11.5	1950	3 M	Hy	2	125	GE	1.0	7	86	60	1	Ad1	6250	750
15.1	DB	34.8	177.0	Re	M	V	M	V	P	C	11.0	1950	3 M	Hy	4	125	GE	1.0	6	67	70	1	Ad1	4400	500
15.1	DB	34.8	177.0	Re	M	V	M	V	P	C	11.2	1950	3 M	Hy	2	125	WE	1.0	6	67	68.4	1	Ad1	6600	750
18.4	DB	22.0	234.0	Re	M	S,D Hy	M	S D Hy	O,G	O,G	18.8		3 M	Hy	1	156	GE	1.25	6	52	90	2	Ad	4100	512
19.4		16.6	100.6	Re	M	V	M	V	G,O	G,O	1080 [5]		2 M	Hy	1	72 [6]	GE	1.0			47.5	2	As Cu	992	112
20.5		8.0	10.2	Tu	M	D	M	D	SS(200)	C	13.6	2100	2 M	R	3	9.4	GE	0.75	3	75	8.0	2	Ad	300	28
17	DB	-	21.5	Re	M	D	M	D	P,O	C,O	13.2	2150	3 M	R	1	40 [6]	WE	0.75	5	115	25	1	Ad	920	80
17	DB		21.5	Re	M	D	M	D	P,O	C,O	13.2	2150			1	40 [6]	WE	0.75	5	115	25	1	Ad		
16.6			21.5	Re	M	D	M	D	P	C	12.1	2137	2 M	R	1	30 [6]	GE	1.25	5	40	29	2	Ad1	325	36
24.7			23.9	Re	Du	V	Du	V	O	O	18.5		1 M,1 T		1	25	GE	1.0	4	55	32	2	Ad	420	38
-	DB	12.0	23.0	Tu	Mp	V	Mp	V	SS(335)	C	12.6	2150	2 M	R	1	22.6	AC	1.0	4	61	17	2	Ad	680	52
					M	Hy	M	Hy	P	C	11.5	1800	2 M		1	22.6	...	0.75	4	Con	....	2	Al Br	340	37
				Re	M	Hy	M	Hy	P	C	10.8	2100	1 M		1	20	AC	0.75	4	21		2	Ad	1125	90
					M	D,V	Mp	D	O	O	18.1		2 M	R	1	7.5	WE	1.0	3	Con	9	2	Al Br	340	30
24.3	DB	DB	84.0	Tu	M	D	M	D	P	C	12.8	1900	1 M,1 T	R	1	25	MV	0.75	4	Con	20	2	Yo	610	55
24.5	DB	DB	41.7	Tu	M	V	M	D	P	C	10.9	1950	5 M, 1 Du	R	1	18.8	CP	0.9	3	Con	15	2	Al B	780	70
24.5	DB	DB	41.7	Tu	M	V	M	D	P	C	10.9	1950		R	1	18.8	CP	0.9	3	Con	15	2	Al B		
				Re	M	D	M	D	C	O	155 [15]		2 M	R	1	12.5 [9]	WE	1.25	4	23	13	2	Br	300	24
30	DB		18.8	Tu	Du	S	Du	S	P,O,C	C,O,G	13.7	2200	1M,1T,10u [8]		1	7.5	WE	1.0	1	Con	...			252	26
17.8	DB		12.8	Tu	M	V	M	D Hy	DS 468	L [7]	9.5	3000	2 M	R	1	20	CP	0.9	2	Con	16	2	Ad	360	40
17.7	DB		12.8	Tu	M	V	M	Hy	SS 560		9.0	2930	2 M	R	1	25	CP	0.8	3	Con	22	2	Ad	725	50
19.8	DB		47.3	Tu	M	V	M	Hy	G,O	C,O	1050 [5]		2 M	R	1	25	CP	0.6	3	Con	22	2	Ad	1025	75
16.9	DB	DB			Du	S	Du	S	SS 375	C	11.4	2090	2 M		1	7.5	GE	1.0	2	Con	11	2	Ad	280	22
					Du	S	Du	S	SS 375	C	11.4	2040	1T,1M	S,P	1	7.5	AC	1.0	2	20	11	2	Ac	90	9

SP – Springfield Boiler Co
s – header stoker
lag tab
ss – stainless steel
sup – Superior
T – Turbine drive

Tu – Tubular
V – Vane control
WE – Westinghouse Electric Corp
Wi – Wickes Boiler Co
Yo – York-Shipley
(481) – Stoker grate area, sq ft

1 – Pressurized furnace
2 – Hp 3600 rpm, lp 1800 rpm
3 – Revised data, previously listed 3/52
4 – Revised data, previously listed 9/53
5 – Btu per cu ft
6 – Pretested standard unit
7 – Sub-bituminous coal
8 – Waterwall surface

9 – Listed 9/53 as Redondo Beach
10 – Listed 9/53 as Redondo. Originally scheduled for Redondo No. 2
11 – One new unit each listed for John Sevier and Kingston. Others revised data, previously listed 3/52 or 9/53
12 – Also F. J. Kennedy & Co
13 – 1000 Btu per gallon

14 – Additional 10-mw auxiliary generator on main shaft
15 – Additional 7.5-mw house generator on main shaft
16 – Future pulverized-coal firing
17 – Future gas firing
18 – Future oil firing

1954 Design Survey: Typical Industrial

Compiled by H. P. Kallen, Assistant Editor

Company	Location	Consulting Engineers	First Operation, New Units	Nominal steam pressure, psig	Nominal steam temperature, F	BOILERS: Number	BOILERS: Capacity, each, 1000 lb per hr	BOILERS: Manufacturer	BOILERS: Boiler & WW surface, 1000 sq ft	BOILERS: Superheater surface, 1000 sq ft	Furnace volume, 1000 cu ft	Heat release, 1000 Btu per cu ft per hr	Furnace bottom
600 PSI AND ABOVE													
Eastman Kodak Co	Rochester, N. Y.	Burns & Roe	6-56	1575	900	1	400	BW	9.5	18.8	10.5		ST
International Paper Co	Panama City, Fla.		9-54	1450	950	1	330	BW	15.5		13.2	36.0	
Electro Metallurgical Co[20]	Marietta, Ohio	Ford, Bacon & Davis	1953	1325	950	4	550	BW	12.6		53.6		DB
Great Northern Paper Co	East Millinocket, Me.	Stone & Webster Engrg Corp	7-54	1200	850	2	300	CE	14.6	10.4	21.6	15.9	DB
American Enka Corp	Enka, N. C.		12-53	1075	720	1	150	BW	9.3	2.1			
[redacted]	[redacted]		7-52	960	950	3	175	FW	2.4		9.8		DB
[redacted]	[redacted]	United Engrs & Constructors	8-53	950	900	2	250	FW	26.8	5.8	20.6	19.3	
Texas Co	[redacted]		9-54	900	750	1	275	FW	22.3	4.0	12.0	30	DB
Weirton Steel Co	Weirton, W. Va.	Rust Engrg Co	10-53	900	820	1	325	CE	48.1		29.6	17.2	DB
Allis-Chalmers Mfg Co	Milwaukee, Wis.	Sargent & Lundy	1-55	875	710	1	150	RS	17.7	2.1	10.3	13.4	DB
			8-54	875	830	1	142	CE	29.8	4.3	13.9	23.1	
Gaylord Container Corp	Bogalusa, La.		7-54	875	830	1	250	RS	26.5	7.2	16.7	{17.6 / 24.5}	
Blanchard Paper Co	Grand Rapids, Minn.	Heinrich & Lutz	12-54	850	800	1	195	BW	19.0	2.3	9.4	26.2	
Brown Co	Berlin, N. H.	Jackson & Moreland	3-55	850	750	1	225	CE					
Cities Service Refining Corp	Lake Charles, La.	C W Saathoff	1-54	850	825	3	375	BW	21.7	4.4	14.6	38.1	
Greenwood Mills	Greenwood, S. C.	Frank Hill Engrs	7-55	850	900	1	300	BW	6.0				ST
Hollingsworth & Whitney Co	Waterville, Me.	Fay, Spofford & Thorndyke	1955	850	725	1	225	RS					DB
John Deere Tractor Works	Waterloo, Iowa		7-54	850	835	1	185	So	9.4		10.5	21.4	
National Container Corp	Clyattville, Ga.		12-53	825	825	{2 / 2}	100 / 150	CE	15.5	4.9 / 8.9	9.6 / 10.5	38.6	DB / DB
Saxon Cotton Mills	Grace, S. C.		11-53	750	750	1	200	BW	11.4	2.7			DB
Hollingsworth & Whitney Co	Mobile, Ala.	Rust Engrg Co	1953	725	750	1	150	CE	16.4		9.7	31.8	
John Strange Paper Co	Menasha, Wis.	Cummins & Barnard, Inc	10-54	725	850	1	125	UI	18.3	6.9	7.9		DE
Standard Oil Co of Indiana	Mandan, N. Dakota		1-53	700	735	2	150	BW	11.2	2.4			
McLouth Steel Corp	Trenton, Mich.		7-53	675	825	3	120	BW	17.7	2.9			
Kellogg Co	Battle Creek, Mich.	Sargent & Lundy	11-54	650	750	1	100	RS	9.6	2.5	6.7	19.3	DB
Shell Oil Co	Wood River, Ill.		8-54	650	750	2	250	RS	24.5	4.4	12.7	30.0	DB
West Va Pulp & Paper Co	Covington, Va.		10-55	650	700	1	325	BW	31.0	6.6	21.3	21.2	DE
Westinghouse Electric Corp	Lester, Pa.		12-53	650	800	1	75	BW	7.0	2.3			
Chemstrand Corp	Pensacola, Fla.	E I Du Pont de Nemours & Co	9-53	640	725	4	180	CE	16.3	3.0	8.7	29.6	
General Electric Co	Pittsfield, Mass.		12-54	640	825	1	200	CE	18.5	4.5	10.4	30.0	DB
Cion Oil Co	Luling, La.	Chemical Const Corp	5-54	630	750	3	125	Vo	11.2	2.1	5.8	15.4	
East Texas Pulp & Paper Co	Evadale, Texas	H A Simons Ltd	9-54	625	750	1	230	BW	12.9	3.6			
			9-54	625	750	1	170	CE	20.6	6.2	12.6		ST
National Petro-Chemicals Corp	Tuscola, Ill.	J F Pritchard	6-53	625	750	3	200	CE	23.7		15.8	16.3	DB
Ohio Oil Co	Robinson, Ill.	Rhodes Equip Co / Arthur G McKee		625	755	1	150	RS	15.7	3.8	11.7		DB
				625	750	2	200	CE	13.2		7.5	18.5	DB
American Motor Car Co, Hudson Div	Detroit, Mich.	Boddy-Benjamin Assoc	1-53	615	725	3	100	BW	9.2		4.6	32.8	
Buckeye Cellulose Corp	Foley, Fla.	A M Kinney	5-54	600	750	2	175	BW	15.0	4.8	12.9	17.2	DB
			5-54	600	750	1	152	CE	15.4	4.5			
			6-54	600	750	1	219	BW	33.5	7.7			
Continental Oil Co	Ponca City, Okla.	Stone & Webster Engrg Corp	6-54	600	750	1	150	Vo	16.2	2.0	8.1	23.2	
Foster Grant Co Inc	Baton Rouge, La.			600	490	2	30	WB	3.8				
Gilman Paper Co	St Marys, Ga.		9-54	600	750	1	300	BW	22.2	2.3	13.5	29.6	DE
Manchester Board & Paper Co	Richmond, Va.	Slaughter, Saville & Blackburn	2-54	600	700	1	65	BW					
Sinclair Refining Co	Marcus Hook, Pa.	Gibbs & Hill	9-54	600	750	1	250	CE	25.0	4.0	12.0	25.3	DE
BELOW 300 PSI													
Linde Air Products Co	Long Reach, W. Va.	Day & Zimmermann Inc	6-55	535	625	2	60	CE	5.2		2.3		
Downingtown Paper Co	Downingtown, Pa.	Albert C Wood Assoc	1-55	450	650	1	150	CE	18.4		10.0		DE
Republic Rubber Div	Youngstown, Ohio		11-53	450	550	1	150	BW	12.8				DB
U S Air Force Base	Goose Bay, Labrador	Fay, Spofford & Thorndyke	9-54	450	550	3	60	UI					
Univ of Notre Dame	Notre Dame, Ind.	Albert Kahn	8-53	450	700	2	70	UI	3.1	1.4	3.6	39.2	
Walworth Co	Kewanee, Ill.		6-53	{450[9] / 185}	500	2	60	BW	7259				
						2	26	EM					
Colorado State Hospital	Pueblo, Colo	Rocky Mountain Engrg Co	2-55	{425[9] / 135[10]}	350[9]	2	30	RS	9.7	4.2[9]	3.8	29.6	DB
Wisconsin Electric Power Co	Port Edwards, Wis		9-55	425	720	1	150	CE					
Rohm & Haas Co	Bristol, Pa.	Dilbert Assoc	9-54	425	600	1	100	BW	10.6	1.6	4.7	27.1	
Univ of Michigan	Ann Arbor, Mich.	Cummins & Barnard Inc	1-55	425	750	1	125	MI			7.7	25.2	
Carbide & Carbon Chemicals Co[20]	Torrance, Calif.		4-55	415	565	2	60	BW	5.8	0.3	2.2	34.2	DB
Spencer Chemical Co	Vicksburg, Miss.		10-53	415	750	2	100	BW	3.9				
American Enka Corp	Lowland, Tenn.		1-55	400	725	1	130	BW	11.3	1.7	3.5		DB
Brea Chemicals Inc	Brea, Calif.		4-54	400	448	3	60	EC	6.4		1.9	35.5	
Carnegie Inst of Technology	Pittsburgh, Pa.	Peter F Loftus Co	1955	{[40][9] / 155[10]}	750[9] / 470[10]	2	65 / 60	EM / BW	9.1 / 6.4	2.7 / 2.3	2.3 / 2.3	35.2[10] / 30.2[10]	
Champion Paper & Fiber Co	Canton, N. C.		2-54	400	750	1	250	RS	29.1		14.2	30.3	
Crystal Tissue Co	Middletown, Ohio		12-54	400	750	1	100	RS	13.4		6.0		DB
U C & E Div, Union Carbide Co	Niagara Falls, N. Y.	Jack D Hinds	11-53	400	745	1	60	BW	7.7		2.3		
Lowe Paper Co	Riceboro, Ga.	F L Smith	9-54	400	550								
Metal & Thermit Corp	Rahway, N. J.		1-54	400	550	1	40	BW	2.9			27.0	DB
Utah-Idaho Sugar Co	Moses Lake, Wash.		9-53	400	575	1	250	RS	39.9	2.1	13.9		

AC – Allis-Chalmers Mfg Co
Ad – Admiralty
AE – Automatic extraction
Al,Br – Aluminum brass
An – Anthracite
B – Bark
BB – Brown Boveri Corp
BFG – Blast-furnace gas
BL – Black liquor
Bl – Bleed
Br – Brass
BW – Babcock & Wilcox Co
BWG – Babcock & Wilcox Co Integral Furnace
C – Coal, bituminous
CB – Cleaver-Brooks Co
CE – Combustion Engineering, Inc
Co – Condensing
Cy – Cyclone furnace
D – Damper
DB – Dry bottom
E – Electrostatic
EC – Erie City Iron Works
Ef – Elliott Co
EM – Edge Moor Iron Works Inc
FW – Foster Wheeler Corp
G – Gas
GE – General Electric Co
Hy – Hydraulic coupling
IB – International Boiler Works Co
L – Lignite
M – Motor drive
Ma – Magnetic coupling
Me – Mechanical
MI – Murray Iron Works Co
MiP – Mixed pressure
Mo – Two motors per fan
MT – One motor, one turbine per fan
Mu – Muntz metal
NC – Non-condensing
O – Oil
P – Pulverized fuel firing
PF – Pressurized furnace
Pl – Plate
R – Regulator

Institutional Steam Plants, Above 600 PSI

Economizer surface, per boiler, 1000 sq ft	Air-heater surface per boiler, 1000 sq ft	Air heater type	Draft-control type	F-D FANS: Drive	F-D FANS: Air volume control	I-D FANS: Drive	I-D FANS: Gas volume control	Firing	Fuel: Type	Fuel: Heating value, 1000 Btu per lb	Fuel: Ash-softening temperature, F	Feed pumps: Drive	Feed pumps: Flow control	Turbines: Capacity, 1000 kw	Turbines: Speed, rpm	Turbines: Manufacturer	Turbines: Backpressure, psia	Turbines: No of bleed or auto-extraction pts	Turbines: Type	Condensers: Surface, 1000 sq ft	Condensers: No water passes	Condensers: Tube material	Total boiler capacity incl new units, 1000 lb	Total generator capacity incl new units, 1000 kw
600 PSI AND ABOVE																								
3.2	33.5	Tu	F	M	Hy	M	D	Cy, PF	C					12.5		WE		4	MP,BI					
7.7	33.7	Tu	Co	V	D	T	S	O	O	18.4		2T	S	20	3600	GE			[1]				1400	34.0
								SS(320)	W	4.7														
		Re	We,L	H		M		P	C			2M,1T		4-40	3600	GE	1.5-5	1[19]	AE	4-30	2		2600	16.0
	68.1	Re		M	V	M	D	O	O	18.5		3T	S	12.5	2400	GE	35-55	1	AE,NC				600	12.5
	37.4							Cy,O[9]	C,O[9]															
	13.1	Re		M	D	T	S,D	G	G	1.0[2]		2T	R	7.5	3600	GE	50	1	AE,NC				525	22.0
15.7	31.6	Tu		T	S	T	S,D	BFG	BFG	0.05[2]		3T	S	15	5000	GE	295		NC				1510	45.0
									O	16.9														
	73.2	Re		M,T		M,T	V	O,G	G	1.7[2]		1T	S										1100	
									C[4]	13.0 09[2]		2M												
	64.0	Tu		M		V		P	C	11.8	2000	2M	R	7.5	3600	AC	2[5]	1	AE,Co	7.3	2	Ad	625	13.9
	16.6	Re	We	M	V	M	V	P	C															
6.9		Tu		M		M	Hy	WH	BL,G															
								[SS(407)	B	4.6														
7.0	29.4	Tu	We	M	D	M	D	G	G	1.0[2]		2T	S	15.0	3600	GE	3[5]	1	AE,Co	14.0	2	Ad	1500	55.0
								SS	C	13.0	2350												360	10.0
4.4	18.7	Tu	We	M		M	Ma																775	48.0
		Tu						P,O	C,O															
	37.0	Tu		M	V	M,T	V	O,G	O,G	1.1[2]		5T	S,R	2-25	3600	GE	2[5]	2	AE,Co	18.5	2	Al,Br	1125	50.0
	58.9	Tu		Mo	V			Cy,PF	C	13.6	2400	2M		25.0	3600	RB				25	2	Mi	300	25.0
		Re	We	M	D	T	S,D	P,O	C,O			1M,1T	R,S	7.5	3600	WE	135	1	BI,NC				450	16.7
									G	1.0[2]														
11.4			We	T	V	T	S	[SS(341)	C	12.2	2180	2T	S,R	7.5	3600	GE	3[5]	2	AE,Co	7.0	2		515	17.0
6.3	15.0	Tu	We,E	M	D	M	D	O,SS	O,BL	18.5		1M,1T	S	2-7.5	3600	WE	50[7]	2	AE,Co			Br	500	15.0
6.3	17.9																							
2.4	35.9							P,O	C,O															
	14.8	Tu	We	M	V	T	S	O,G SS[6]	O,G,B	4.5[6]														
18.0			We	Mo	V	Mo	D	SS(322)	C	11.5	2160	1M,1T	R	5.0	3600	AC	50	1	BI,NC				230	5.0
								O,G	O,G															
	26.9							BFG,O	BFG,O					4.0	3600	WE	150		NC					
	16.2	Tu	We	M		M		P	C	13.2	2300	1T	S										300	3.0
									O	18.5														
	25.0	Tu		T	S	T	S	[O	G	1.2[2]		1T	R										1850	20.0
								TG	C,B	12.5	2800												1300	57.0
16.3			We	M	S,D	T	S,D	O,SS[9]	O															
	4.6							G[8]	G	1.0[2]		4T	S	5.0	3600	WE	190		NC				720	5.0
2.9	5.3	Tu		T	S,D	T	S,D																600	22.5
	12.4	Re	We	M	D,V	M	D	P,O	C,O	13.9	2200												575	
	15.6	Tu		2M,1T	D,V	2M,1T	D,V	WH,Cy,PF	G	1.0[2]		2M,1T												
								[SS(157	B															
3.0	18.2	Tu	We	M	V	M	D	G	G	1.0[2]														
12.0	13	13	E	M	V	M	Hy	BL	BL	6.5		1M,1T		7.5	3600	GE	75	1	AE,NC				400	7.5
	25.6	Tu	We	Mo	V	M	D	P,G	C,G	11.5	2100	3M,3T	R	2-5.0	3600	AC			AE,Co	6.0	2	Ad	600	10.0
	15.4	Tu	We	MT	S,D,Ma	MT	S,D,Ma	P,O,G	C,O,G	[17]	2000	2M,1T		2-4.0	3600	EI	1.0[5]	1	AE,Co	4.8	2	Ad	350	8.0
	15.5	Tu	We	MT	V	MT	V	P,O,G	C,O,G	[17]	2000	2M,1T												
														1.6	3600	WE		1	BI,Co	5.0	2	Ac	300	11.5
5.2			We	T	S,D	T	S	SS(210)	C	14.2	2800	1M,2T		3.8		GE								
	25.5	Tu		T	S,V	T	S,D	C	O	15[14]		1T	S	7.5	3600	GE	65	1	AE,NC					
	14.6	Tu	We	M	V	T	S,D	O[15],SS(230)	O[15],B	8.5[16]		1T	S	6.0	3600	GE	65	1	AE,NC				721	15.0
6.5	13	13	E	M	D	T	S,D	WH	BL	7.0		1T	S	1.5	3600	WE	2[5]		Co	6.0	2			
	16.1	Tu		T	S	T	S	O,G	O,G	1.1[2]		3T	S	7.5	3600	WE	2.5[5]	1	AE,Co	13.0	2	Ad	600	15.5
				T	S			G	G	1.0[2]		2T	R	2-0.5	1800	EI	30		NC				60	1.0
				M	V							1M		1-15	3600	GE	1	2	AE,Co	12.0	2	Ac	620	23.0
	48.1	Tu	We	M	D	M	D	O,B	O,B			1M,1T	R,S	2.0		WE	65		NC				65	2.0
			We	M	V	M	D	TG	C			2T	S										250	
	24.0	Re		T	S,D	T	S,D	O,G	O,G															
BELOW 600 PSI																								
2.0				T	S,D	T	S,D	SS(110)	C	13.3	2300	3T	S										100	
	18.0		We	M	V	T	S,D	P,O	C,O	13.5														
	18.3	Tu	We	M	V	M	D	C	C	13.9	2300	1M	R										100	2.3
		Tu		T	V	T	V	O	O			1M,2T	R,S	2.0	3600	Wo	2[5]	1	BI,Co		2		180	7.0
2.8			We	MT	D	MT	D	SS(142)	C	11.6	2100	2M,1T	S	2.0	3600	EI	1.5[5]	1	AE,Co	2.3	2	Al,Br	180	4.0
2.6									C	11.0														
				MT	D	MT		SS	G	1.0[2]	2050	3M,3T	R	2-2.5	3600	GE	5	1	AE,Co				172	5.0
	5.6	Tu	We	T	V	T	E	TG(208)	C	11.7	2200												160	
												1M,1T	R,S											
			E	M	S,V	M	Hy	WH	BL			1T	S,R										340	2.0
3.6			We	M	D	T	D	SS(206)	C	12.5	2000													
12.2			We	M	V	M	D	UF(341)	C	13.5	2100	1M,1T	R											
																							120	
	5.2	Tu		T	S			PF	O,G			2T	S										240	
	5.1	Tu		MT		MT		G	G			1M,1T												
	27.5	Tu	We	T	S,V	T	D	P	C	13.6	2500	1M,2T	S	3-5.0	3600	EI		1	AE,Co	6.5	2	Ad	650	15.0
				1M,2T	D	1M,2T	D	G	G	1.0[2]		1M,1T	P										150	
1.9			We	M	V	T	S	UF(191)	C	12.2	2470	1T	S										115	
1.1			We	M	V	T	S	SS(136)				1M	R											
3.7	26.5	Tu	We	Mo	V	T	S	SS(492	C	13.0	2300	1M,2T								2-8.0	2	Ac	1435	51.0
								[	B,Wk															
	10.6	Tu	We	M	D	M	D	F	C	13.5	2800													
2.5				M	D	M	D	WH-0	O	18.4		1M,1T	R	4.0	3600	GE	2[5]	1	AE,Co	5.3	2	Ac	50	4.0
														5.0	3600	WE	2[11]	1	MP				85	3.5
	2.4	Tu		M	D	M	D	P,O	C,O															
10.5		F	We	T	S,D	T	S,D	E	E	12.5		2T	S	4.0	3600	EI	40		NC				250	

Re – Regenerative
RS – Riley Stoker Corp
S – Speed control
Sp – Springfield Boiler Co
SS – Spreader stoker
ST – Step-fat
T – Turbine drive
TG – Traveling-grate stoker
Tu – Tubular

UF – Underfeed stoker
UI – Union Iron Works
V – Vane control
Vo – Henry Vogt Machine Co
W – Wood
WB – Wm Bros Boiler & Mfg Co
WE – Westinghouse Electric Corp
Wh – Waste heat
Wo – Worthington Corp

Wk – Wood waste
(320) – Stoker grate area, sq ft
[1] – Automatic extraction, mixed pressure
[2] – 1000 Btu per cu ft
[3] – Burning gas
[4] – Also blast-furnace and coke-oven gas
[5] – In. Hg absolute
[6] – Burning bark
[7] – Also 2-in. Hg absolute

[8] – Tilting burners
[9] – Future
[10] – Initial
[11] – Induction point
[12] – Also CO gas
[13] – Steam preheater
[14] – 1000 Btu per gal
[15] – Supplementary fuel
[16] – Burning dried bark

[17] – Heating value:
Coal-11,000 Btu per lb
Oil-160,000 Btu per gal
Gas-1150 Btu per cu ft
[18] – Heating value blast-furnace gas-90 Btu per cu ft
[19] – Single automatic-extraction point, four bleed points
[20] – Div of Union Carbide & Carbon Corp

Initial capacity, hp	Added capacity no. of units	Added capacity date	Ultimate capacity, hp	No. of units installed	Waterwheel capacity, hp	Waterwheel type	Speed, rpm	Static head, ft	Design head, ft	[3] Waterwheel manufacturer	[3] Governor manufacturer	Scroll case, concrete or steel	Penstock-valve, type	Generator capacity, kva	Synchronizing, automatic or manual	[4] Thrust-bearing location	Design power factor	Kilovolts	Cycles	[3] Generator manufacturer
107 300			107 300	2	42 000	Francis	128.6	155	145	BL	W	Plate st	Head gt	33 333	Auto or man	BG	0.9	13.8	60	GE
				1	21 000	Francis	180	169	145	BL	W	Plate st	Head gt	16 677	Auto or man	BG	0.9	13.8	60	GE
				1	2 300	Francis	500	155	145	MS	W	Plate st	Head gt	1 750	Manual	AG	0.8	2.4	60	GE
6 000			6 000	2	3 000	Propeller	120	20	20	JL	W	Concrete	Head gt	2 500	Automatic	BG	0.8	2.4	60	WE
30 220			45 330	2	15 110	Francis	256.7	166-152	165	MS	W	Plate st	Dow	13 500	Manual	AG	0.9	6.9	40	GE
18 000			27 000	3	9 000	Francis	180	86	77	AC	W	Plate st	Head gt	8 000	Auto or man.	AG	0.80	11.5	60	AC
750			750	1	750	Francis	514	67	67	JL		Cast iron	Head gt	625	Automatic	HS	0.80	2.4	60	EM
1 960			1 960	1	530	Francis	200	26	26	JL		Concrete	Head gt	Connects to existing GE generators						
220 000			275 000	4	55 000	Francis	128.6	159-119	150	MS	W	Plate st	Head gt	39 000	Manual	BG	0.90	13.8	60	WE
7 700			7 700	1	7 700	Francis	327	148-110	136	JL	W	Plate st	Head gt	6 900	Auto & man	AG	0.80	4.16	60	GE
4 070			4 070	1	4 070	Francis	257	57	57	MS	W	Concrete	Head gt	3 500	Manual	AG	0.80	6.6	60	WE
365			365	1	365	Francis	225	23	23	JL		Concrete	Head gt	312	Manual	AG	0.80	0.6	60	WE
				1			164							600			0.80	0.6	60	EM
57 000			57 000	1	57 000	Kaplan	138.5	99-72	96	AC	W	Concrete	Head gt	43,750	Auto. or man	BG	0.80	11.5	60	AC
25 400			25 400	1	25 400	Francis	120	85	83	MS	W	Plate steel	Head gt	21 500	Automatic	BG	0.90	11.5	60	AC
30 650			30 650	1	30 650	Francis	120	104	101	MS	W	Plate st	Head gt	25 000	Automatic	BG	0.90	11.5	60	GE
30 600			30 600	1	30 600	Francis	120	102	101	MS	W	Plate st	Head gt	25 000	Automatic	BG	0.90	11.5	60	GE
18 650			18 650	1	18 650	Francis	112.5	69	67	MS	W	Plate st	Head gt	16 000	Automatic	BG	0.90	6.9	60	AC
22 000			22 000	1	22 000	Francis	120	105	104	MS	W	Plate st	Head gt	25 000	Automatic	BG	0.90	11.5	60	GE
26 000			26 000	1	26 000	Francis	327		330	NN	W	Plate st	Pivot	26 000		AG	0.90	13.8	60	WE
393			393	1	393	Francis	166	21	21	JL		Concrete	Head gt	Drives mill machinery						
3 000			3 000	1	3 000	Francis	180	44	44	JL		Concrete	Head gt							GE
23 975	1	1953	32 350	3	6 975	Propeller	80	23-18	21	AC	W	Concrete	Head gt	5 333	Manual	BG	0.90	13.8	60	GE
				1	3 000	Kaplan	125.5	23-18	21	MS	W	Concrete	Head gt	2,500	Manual	AG	0.90	4.16	60	GE
620			620	1	620	Francis	225	21	21	JL		Concrete	Head gt	500		AG	0.80	2.4	60	EM
317			317	1	317	Francis	150	15	15	JL		Concrete	Head gt	Connects to existing EM generator						
1,272			1,272	4	318	Francis	177	18	18	JL		Concrete	Head gt	Connects to existing generators						
572			572	4	143	Francis	82	8	8	JL		Open flume	Head gt	Connects to existing generators						
207 050	2	1953	274 050	6	33 500	Francis	112.5	94	90	AC	AC	Plate st	Head gt	23,888	Manual	BG	0.80	13.8	60	WE
				2	3 025	Francis	327	94	90	AC	AC	Plate st	Head gt	3,000	Manual	AG	0.70	2.4	60	WE
				2	35 500	Francis	112.6	94	90	AC	AC	Plate st	Head gt	23,888	Manual	BG	0.80	13.8	60	WE
16 300			16 300	4	3,200	Francis	240	48	48	MS		Plate st	Head gt	2,750	Automatic	HS	0.90	13.8	60	WE
				1	3,500	Kaplan	277	48	48	MS	W	Concrete	Head gt	3,125	Automatic	AG	0.80	13.8	60	WE
440 000			440 000	5	88 000	Francis	90	187-100	150	BL	W	Plate st	Head gt	84,210	Manual	BG	0.95	13.8	60	GE
194 000			485 000	2	97 000	Francis	94.7	210-130	170	...		Plate st	Head gt	70,000	Manual	BG	0.95	13.8	60	....
460 000	4	1955	460 000	8	57 500	Francis	85.7	145-76	112	AC	W	Plate st	Head gt	42,105	Manual	BG	0.95	13.8	60	WE
162 000			162 000	2	54 000	Kaplan	75	66-40	48	BL	W	Concrete	Head gt	35,100	Manual	BG	0.95	13.8	60	GE
6 750			6 750	3	2 250	Francis	900	123	123	JL		Plate st	Head gt	Drives pumps						
290 200	3	1953	290 200	6	45 000	Francis	85.7	108-60	90	NN	W	Plate st	Head gt	35,555	Manual	BG	0.90	13.8	60	WE
				1	17 000	Francis	138.5	108-60	90	BL	W	Plate st	Head gt	13 333	Manual	BG	0.90	13.8	60	WE
				2	1 600	Francis	450	108-60	90	JL	W	Service unit	Head gt	1,250	Manual	AG	0.80	0.48	60	WE
19 660			19 660	2	9 400	Francis	275	176-108	152	JL	W	Plate st	Head gt	7,500	Manual	AG	0.90	13.8	60	GE
				1	860	Francis	720	176-108	152	JL	W	Service unit	Head gt	750	Manual	AG	0.80	0.48	60	GE
4 400			4 400	2	2 200	Francis	277	60	60	JL	W	Plate st	Head gt	1,500	Automatic	AG	0.80	2.4	60	EC
140 000			140 000	4	35 000	Kaplan	128.6	82-36	74.5	NN	W	Concrete	Head gt	27,800	Automatic	BG	0.90	14.4	60	GE
770			770	1	770	Propeller	277	38	38	JL		Concrete	Head gt	625	Manual	AG	0.80	0.6	60	WE
13 040			13 040	1	13 040	Francis	400	235-220	230	MS	W	Plate st	Head gt	10,000	Automatic	AG	0.90	4.16	60	WE
12 570			12 570	1	12 570	Francis	600	522-458	502	MS	W	Plate st	Butterfly	12,000	Automatic	AG	0.90	4.16	60	GE
328			328	1	328	Francis	240	32	32	JL		Concrete	Head gt	Connects to existing Westinghouse generator						
388 600	3	1953	388 600	7	55 000	Francis	100	150-111	135	NN	AC	Plate st	Head gt	44 444	Manual	BG	0.90	12.8	60	GE
				2	1 800	Francis	600	150-111	135	JL	W	Plate st	Head gt	1,250	Manual	AG	0.80	0.48	60	GE
118 400			118 400	2	55 000	Francis	100	170-104	136	NN		Plate st	Head gt	44 444	Manual	BG	0.90	12.8	60	WE
				1	8,400	Francis	277	170-104	136	JL		Plate st	Head gt	6 667	Manual	AG	0.80	13.8	60	WE
630			630	1	630	Propeller	180	16	16	JL	W	Concrete	Head gt	563	Manual	AG	0.80	0.60	60	WE
25 600	2	1955	39 600	2	7 000	Francis	200	65-52	60	JL	W	Plate st	Head gt	6 250	Manual	HS	0.80	4.16	60	AC
6, 000			6, 000	2	30, 500	Francis	105.9	93-81	92	MS	W	Concrete	Head gt	25 000	Manual	BG	0.90	6.9	60	GE
42 000			42 000	3	14,000	Terry	75	30-14	26	NN	W	Concrete	Head gt	11,111	Manual	BG	0.90	13.8	60	WE
50 000			50 000	2	25 000	Kaplan	138.5	75-58	61	NN	W	Concrete	Head gt	20 000	Auto or man.	BG	0.90	13.8	60	WE
13 800			13 800	1	13 800	Francis	180	123-55	100	JL	W	Plate st	Head gt	11,111	Auto or man.	BG	0.90	6.9	60	WE
118 500	1	1954	154 000	2	41 500	Francis	94.7	129-4	100	MS	W	Concrete	Head gt	33 333	Manual	BG	0.90	13.8	60	GE
				2	35 500	Francis	90	95-47	80	MS	W	Concrete	Head gt	25 886	Manual	BG	0.90	13.8	60	GE
21 000			21 000	3	21 000	Francis	180	166-76	124	JL	W	Plate st	Head gt	16 667	Automatic	BG	0.90	13.8	60	WE
80 000	1	1955	160 000	2	40 000	Francis	120	195	190	NN	W	Plate st	Head gt	64 000	Manual	BG	0.90	13.8	60	WE
hp 2900-cfs 205-ft head pump ⟶				1	80 000	Francis	105.9	195	190	AC	AC	Plate st	Head gt	76,000	Manual	BG	0.90	13.8	60	AC
50 000	1	1955	75 000	3	25 000	Francis	163.6	154-118	140	MS	W	Plate st	Head gt	20 000	Manual	BG	0.90	13.8	60	WE
377 000	3	1953	377 000	5	62 500	Francis	105.9	214-111	160	BL	W	Plate st	Head gt	50 000	Manual	BG	0.90	13.8	60	GE
				1	2 000	Francis	600	204-111	160	JL	W	Service unit	Head gt	1 500	Manual	AG	0.80	0.48	60	EC
180 000	1	1955	180 000	4	45 000	Kaplan	75	69-25	45	BL	W	Concrete	Head gt	31 250	Manual	BG	0.80	13.8	60	GE
60 000			60 000	2	30 000	Kaplan	60	32	32	NN		Concrete	Head gt	13 333	Manual	BG	0.90	13.8	60	WE
272 000			272 000	4	68 000	Francis	128.6	229-134	196			Plate st	Head gt	42 105	Manual	BG	0.95	13.8	60	
104 000			104 000	2	52 000	Francis	120	196-128	168	MS	W	Plate st	Butterfly	41 667	Manual	BG	0.90	13.8	60	WE
64 000			96 000	4	16 000	Francis	100	90-56	69	BL	W	Concrete	Head gt	12,500	Manual	BG	0.90	13.8	60	AC
47 000			94 500	2	23 500	Francis	150	183-104	132	MS	W	Plate st	Butterfly	17 895	Automatic	BG	0.95	13.8	60	EC
41 400			41 400	2	20 700	Francis	128.6	129-79	90	NN	W	Plate st	Head gt	16 667	Manual	BG	0.90	13.8	60	AC
88 500			133 000	6	14 750	Francis	164	114-66	100	AC	W	Plate st	Head gt & butterfly	11,667	Auto & man	AG	0.90	6.9	60	GE
47 500			47 500	1	47 500	Francis	450	84-62.5	64.5	PW	W	Cast st	Head gt	35 000	Automatic	AG	0.95	13.8	60	EC
108 000			108 000	2	45 000	Francis	514	83.5-107.5	104.5	PW	W	Cast st	Butterfly	38 000	Auto or man	AG	0.90	13.8	60	WE
a 15 700-hp 300-rpm, 440-ft head pump ⟶				1	22 000	Francis	257		290	AC	AC	Plate st	Butterfly	8 500	Manual	AG	1.00	13.8	60	AC
300			300	1	300	Francis	400	34-22	34	JL	W	Concrete	Head gt	200	Manual	AG	0.80	2.4	60	GE
450			450	1	450	Francis	600	75	75	JL	W	Plate st	Head gt	375		AG	0.80	2.4	60	WE

EM – Electric Machinery Mfg Co
GE – General Electric Co
JL – James Leffel & Co
KMW – KMW of Sweden
MS – S Morgan Smith Co
MSC – S Morgan Smith, Canada Ltd
MVE – Metropolitan-Vickers Electrical Co Ltd
NEC – Northern Electric Co Ltd
NN – Newport News Shipbuilding & Dry Dock Co
OCL – Dominion Canada Ltd
PO – Pacific Dominion Co
PW – Pelton Water Wheel Co
SGE – Swedish General Electric Co Ltd
VEW – Vancouver Engineering Works Ltd

W – Woodward Governor Co
WE – Westinghouse Electric Corp
WEI – Westinghouse Electric International Co

[4] AG indicates thrust bearing is above generator rotor; BG thrust bearing is below generator rotor; HS, horizontal-shaft machine.

[5] Dam and tunnels with steel pipe conduits are being built by the New York City Board of Water Supply as part of the Delaware River water system.

[6] Two power plants are being built, one in Mexico and one in the United States, each with three 14,750-hp units.

[7] Vertical-shaft 6-nozzle type.

[8] was Furman Shoals

1951 Design Survey: Typical Hydroelectric

Compiled by F A Annett
Contributing Editor

Company or government agency	Designing or consulting engineers	Project name	[1]New or redeveloped	River	State or Province	Project started, date	[2]Dam type	Crest length, ft	Max. height, ft	Initial operation date
MOUNTAIN STATES continued										
Parowan City Corp		Red Creek	New		Utah	1953				1954
Lower Valley Power & Light, Inc	Lower Valley Power & Light, Inc	Strawberry Creek	New	Strawberry Creek	Wyo.	1953	CG	700	70	1953
U S Bureau of Reclamation	U S Bureau of Reclamation	Alcova	New	North Platte	Wyo	1951	EF	753	255	1954
U S Bureau of Reclamation	U S Bureau of Reclamation	Hungry Horse	New	So Fork Flathead	Mont.	1948	CA	2,100	564	1952
U S Bureau of Reclamation	U S Bureau of Reclamation	Canyon Ferry	New	Missouri	Mont.	1949	CG	1,000	220	1953
Montana Power Co	**Ebasco Services, Inc**	**Kerr**	New	Flathead	Mont.	1930	CA	285	270	1938
U S Corps of Engineers	Sverdrup & Parcel, Inc	Albeni Falls	New	Pend Oreille	Idaho	1951	CG	755	83	1954
U S Bureau of Reclamation	U S Bureau of Reclamation	Palisades	New	Snake	Idaho	1952	EF	2,200	260	1956
Washington Water Power Co	**Ebasco Services, Inc**	**Cabinet Gorge**	New	Clark Fork	Idaho	1951	CA	320	170	1952
PACIFIC COAST STATES										
U S Corps of Engineers	U S Corps of Engineers	Chief Joseph	New	Columbia	Wash.	1949	CG	2,315	235	1955
U S Corps of Engineers	U S Corps of Engineers	McNary	New	Columbia	Wash.	1947	CG&EF	8,000	[3]67	1953
U S Corps of Engineers	U S Corps of Engineers	The Dalles	New	Columbia	Wash.& Ore.	1951	CG			1958
U S Corps of Engineers	U S Corps of Engineers	The Dalles Fishwater	New	Columbia	Ore.	1951				
PUD No. 1 Chelan County	Stone & Webster Engrg Corp	Rock Island	New	Columbia	Wash.	1930	CG	1,080	120	1931
PUD No. 1 Pend Oreille County	Harza Engineering Co	Box Canyon	New	Pend Oreille	Wash.	1952	SG	700	105	1954
Pacific Power & Light Co	Ebasco Services, Inc	Yale	New	Lewis	Wash.	1951	EF	1,600	323	1953
City of Seattle	Dr J L Savage	Ross	New	Skagit	Wash.	1937	CA	1,300	540	1952
Centralia Elec Pwr Heat & Lt Dept		Nesqually No. 1	New	Nesqually	Wash.	1953				1955
U S Bureau of Reclamation	U S Bureau of Reclamation	Chandler	New	Yakima	Wash.	1953	CG	768	8	1955
U S Bureau of Reclamation	U S Bureau of Reclamation	Chandler	New	Yakima	Wash.	1953	CG	768	8	1955
Portland General Electric Co	L C Stevens; Portland Gen Elec Co	T W Sullivan	Red.	Willamette	Ore.	1952	CG	4,300	55	1953
California Oregon Power Co	**Pioneer Service & Engrg Co**	**Clearwater No. 1**	New	Clearwater	Ore.	1951	EF	334	30	1953
California Oregon Power Co	Pioneer Service & Engrg Co	Clearwater No. 2	New	Clearwater	Ore.	1951	RFTC	157	26	1953
California Oregon Power Co	Pioneer Service & Engrg Co	Lemolo No. 1	New	North Umpqua	Ore	1953	RFCF	885	120	1955
California Oregon Power Co	**Pioneer Service & Engrg Co**	Lemolo No. 2	New	North Umpqua	Ore.	1953	CG&B	196	55	1956
U.S. Corps of Engineers	U S Corps of Engineers	Detroit	New	North Santiam	Ore.	1947	CG	1,525	450	1953
U S. Corps of Engineers	U S. Corps of Engineers	Big Cliff	New	North Santiam	Ore.	1951	CG	295	172	1954
U S Corps of Engineers	U.S. Corps of Engrs, Stevens & Thompson Engrs	Lookout Point	New	Middle Fork Willamette	Ore.	1949	CG&EF	4,240	258	1954
U S Corps of Engineers	U S Corps of Engineers	Dexter	New	Middle Fork Willamette	Ore.	1953	EF	2,335	80	1955
Pacific Gas & Electric Co	Pacific Gas & Electric Co	Murphys	Red	North Fork Stanislaus	Calif.	1953	CG,S&B			1953
Pacific Gas & Electric Co	**Pacific Gas & Electric Co**	Pit No 4	New	Pit	Calif.	1953	CG,S&B	415	74	1955
U.S. Corps of Engineers U S Bureau of Reclamation	U.S Bureau of Reclamation U S Corps of Engineers	**Folsom**	New	American	Calif.	1947	CG&EF	10,230	340	1955
U.S Bureau of Reclamation	U.S Bureau of Reclamation	Nimbus	New	American	Calif.	1952	CG	813	50	1955
Imperial Irrigation District	Gibbs & Hill, Inc	Drop No. 2	New	All American Canal	Calif.	1952				1953
Hercules Powder Co		Hercules	New		Calif.	1953				1954
U.S. POSSESSIONS										
U S Bureau of Reclamation	U S. Bureau of Reclamation	Eklutna	New	Lake Eklutna	Alaska	1951	EF			1954
Ketchikan Public Utilities		Beaver Falls	New		Alaska	1952				1954
Kekaha Sugar Co		Kauai	New		Hawaii	1951				1953
Puerto Rico Water Resources Authority	Jackson & Moreland	Yauco No. 1	New	Guayo	P.R	1953	CG	585	190	1955
Puerto Rico Water Resources Authority	Jackson & Moreland	Yauco No. 2	New	Yauco	P.R.	1952	CG	591	178	1954
CANADA					Province					
Anglo-Newfoundland Development Co		Bishop Falls	Red	Exploits	N.F	1952				1953
Newfoundland Light & Power Co	Montreal Engineering Co	Horse Chops	New	Horse Chops	N.F	1951	EF	2,700	36	1953
Iron Ore Company of Canada	Montreal Engineering Co	Menihek	New	Ashuanipi	Lab. N.F.	1952	CG&EF	20,000	60	1954
Nova Scotia Light & Power Co	Montreal Engrg Co & N.S. Light & Pwr Co	Nictaux Lake	New	Nictaux	N.S.	1952	RE	1,100	90	1954
New Brunswick Electric Power Comm	Power Corp of Canada	Tobique	New	Tobique	N.B.	1950	CG	350	90	1953
Quebec Hydro-Electric Commission	H G Acres & Co	Beauharnois No. 2	New	St. Lawrence	Que	1948	P&G	4,500	31	1951
Quebec Hydro-Electric Commission	H G Acres & Co Frazer Brace Engrg	Rapids No. 2	New	Ottawa	Que.	1951	CG	1,326	110	1954
Quebec Hydro-Electric Commission	H G Acres & Co	Bersimis-Lac Casse	New	Bersimis	Que.	1953	RF	2,215 1,342	200 230	1956
Aluminum Company of Canada	Shawinigan Engineering Co	Peribonka No. 2	New	Peribonka	Que.	1951	CG	3,000	130	1953
Shawinigan Water & Power Co	Shawinigan Engineering Co	Trenche	New	St. Maurice	Que.	1946	CG			1950
Shawinigan Water & Power Co	Shawinigan Engineering Co	Rapide Blanc	New	St. Maurice	Que.	1930	CG		132	-
Shawinigan Water & Power Co	Shawinigan Engineering Co	La Tuque	New	St. Maurice	Que.	1938	CG	1,225	131	1940
Sutt Power Co	Stadler Hunter & Co	Marguerite	New	Marguerite	Que	1951	CG	450	120	1954
Lake Megantic Municipal Corp		Graynurst	New	Chaudiere	Que	1952				1953
Price Bros & Co Ltd	Montreal Engineering Co	Jim Gray	New	Shipshaw	Que	1953	Earth	1,000	145	1953
Price Bros & Co Ltd	Montreal Engineering Co	Brochet	New	Shipshaw	Que	1953	Earth	1,335	92	1953
Hydro-Electric Power Comm of Ontario	Hydro-Electric Power Comm of Ontario	Sir Adam Beck-Niagara No. 2	New	Niagara	Ont.	1950				1954
Hydro-Electric Power Comm of Ontario	Hydro-Electric Power Comm of Ontario	Pine Portage	New	Nipigon	Ont.	1947	CG	3,900	150	1950
Ontario Minnesota Pulp & Paper Co Ltd	Company engineers	Fort Frances	Red	Rainy	Ont.	1954	CG	700	50	1955
Great Lakes Power Co	Harza Engineering Co	McPhail Falls	New	Michipicoten	Ont.	1951	C&E	620	70	1954
Manitoba Hydro-Electric Board	H G Acres & Co	McArthur Falls	New	Winnipeg	Man	1952	CG&EF	31,000	30	1954
Calgary Power Co	Montreal Engineering Co	Bearspaw	New	Bow	Alta	1953	CG&EF	1,200	56	1955
Calgary Power Co	Montreal Engineering Co	Ghost Extension	New	Bow	Alta	1952				1954
Aluminum Company of Canada	B C International Engrg Co	Kemano	New	Nechako	B C	1951	RF	1,550	317	1954
British Columbia Electric Co	Shawinigan Engineering Co British Columbia Electric Co	Bridge River	New	Bridge	B C	1946	EF	1,300	90	1948
British Columbia Electric Co	B C International Engrg Co	Seton	New	Seton & Cayoosh Cr	B C	1954	TC Concrete	900 450	30 75	1956
Cons. Mining & Smelting Co of Canada	Stone & Webster Canada Ltd	Waneta	New	Pend Oreille	B C	1951	CG	350	250	1954
British Columbia Power Commission	H G Acres & Co	John Hart	New	Campbell	B C	1945	CG	2,400	140	1949
British Columbia Power Commission	B C Power Comm H G Acres & Co	Puntledge	Red	Puntledge	B C	1953	CG	200	35	1954
British Columbia Power Commission	B C Power Commission	Quinsmacheen	New	Spuzzmacheen	B C	1953	CG	120	35	1954
Alaska Pine & Cellulose Ltd		Port Alice	New		B.C	1952				1953

[1]The term "New" applies to a project on a site not developed before. Redeveloped indicates a project on a site that has been developed before and now has new turbines, settings, generators or a new plant.

CG, concrete gravity; CG&EF, concrete gravity and earth fill; CG,S&B, concrete gravity, slab and buttress; CG&B, concrete slab and buttress; EC, earth and concrete; EF, earth fill; EF&RF, earth, riprap rock; EP, E&RF, earth and rock fill; P&G, piers and gates; RE, rock earth; RF, rock fill; TC, timber crib; SC, sector gates; TC, timber crib.

[3]AC – Allis-Chalmers Mfg Co
BL – Baldwin-Lima-Hamilton Corp
CAC – Canadian Allis-Chalmers Ltd
CGE – Canadian General Electric Co Ltd

CWC – Canadian Westinghouse Co Ltd
DEC – Dominion Engineering Co Ltd
EC – Elliott Co
EE – English Electric Co Ltd
EEC – English Electric Co of Canada Ltd
FM – Fairbanks Morse Mfg Co

Initial capacity, hp	Added capacity, no. of units	Added capacity, date	Ultimate capacity, hp	No. of units installed	Waterwheel capacity, hp	Waterwheel type	Speed, rpm	Static head, ft	Design head, ft	[3] Waterwheel manufacturer	[3] Governor manufacturer	Scroll case, concrete or steel	Penstock valve, type	Generator capacity, kva	Synchronizing, automatic or manual	[4] Thrust-bearing location	Design power factor	Kilovolts	Cycles	[3] Generator manufacturer
565			565	1	565	Impulse	600	745	732	PW	W									
1 450	1	1952	2 175	1	725	Impulse	514	450-520	450	MS	W		Head gt	525	Manual	HS	0.80	2.4	60	EM
53 000			53 000	2	26 500	Francis	163.6	165-143	155	NN	W	Plate st	Butterfly	16,950	Manual	AG	0.95	6.9	60	EC
420 000	2	1953	420,000	4	105,000	Francis	180	485-262	400	AC	W	Welded pl st	Head gt	75,000	Manual	AG	1.00	13.8	60	GE
70 500	2	1954	70,500	3	23,500	Francis	150	160-80	125	NN	W	Plate st	Head gt	16,667	Manual	AG	1.00	6.9	60	GE
77 000	1	1953	231 000	3	77,000	Francis	112.5	191	189	2NN,1BL	W	Plate st	Head gt	56 000	Manual	BG	0.90	13.8	60	WE
58 800			55,800	3	19,600	Kaplan	54.5	33-8	22	BL	W	Concrete	Head gt	15 778	Manual	BG	0.90	13.8	60	GE
158 000			158,000	4	39,500	Francis	163.6	245-114	190	MS		Welded pl st	Butterfly	30,000	Manual	AG	0.95	11.5	60	PO
282,000	2	1953	282,000	{3	70,500	Propeller	120	100-85	99	BL	W	Plate st	Head gt	55,555	Manual	BG	0.90	13.8	60	WE
				{1	70,500	Kaplan	120	100-85	99	BL	W	Plate st	Head gt	55,555	Manual	BG	0.90	13.8	60	WE
				{10	180,000	Francis	100	183-148	165	NN	AC	Plate st	Head gt	67 386	Manual	BG	0.95	13.8	60	WE
2,000,000			2,220,000	{6	100,000	Francis	100	183-148	165	MS		Plate st	Head gt	67,386	Manual	BG	0.95	13.8	60	
				{2	3,500	Francis	514	183-148	165	PW	PW	Plate st	Head gt			BG			60	
1,567,200	{2	1952	2,225,900	{34	111,300	Kaplan	85.7	92-62	80	MS	AC	Concrete	Head gt	73,684	Manual	BG	0.95	13.8	12-GE	2-EE
	{4	1954		{2	4,500	Francis	277	92-62	80	PW	W	Concrete	Head gt	3,750	Manual	AG	0.80	4.16	50	EM
1,770,800			2,761,200	{14	123,800	Kaplan	85.7	91-60	81	BL		Concrete	Head gt	82,105	Manual	BG	0.95	13.8	60	
				{2	16,800	Kaplan	200		74	AC		Concrete	Head gt							
84 000	{3	1952	286,000	{4	21,000	Propeller	100	51-20	32	AC	AC	Concrete	Head gt	16,667	Manual	BG	0.90	13.8	60	GE
	{3	1953		{6	34,000	Kaplan	100	51-20	45	AC	AC	Concrete	Head gt	25,000	Manual	BG	0.90	13.8	60	AC
98 000			125 500	4	24,500	Kaplan	100	46-20	41	AC	W	Concrete	Head gt	16,667	Manual	BG	0.90	13.8	60	EC
140 000			280 000	2	70,000	Francis	150	272-190	224	MS	W	Plate st	Head gt	60,000	Automatic	BG	0.90	13.8	60	GE
360 000	2	1953	440 000	3	120 000	Francis	150		355	BL	W	Welded pl st	Butterfly	100,000	Auto. or man.	AG	0.90	13.8	60	WE
7 500			7,500	1	7,500	Francis	400		205	MS				6,250		AG	0.80	2.4	60	WE
17 000			17 000	2	8,500	Francis	240	125-107	116	JL	PW	Plate st	Head gt	6,315	Manual	AG	0.95	4.16	60	EM
5 200			5 200	2	2,600	Francis	240	125-107	116	JL		Plate st	Head gt	Drives Worthington pumps						
20 000			20 000	12	1,600	Propeller	242	44-16	40	PW		Open flume	Head gt	1 200	Automatic	AG		4.16	60	WE
21 000			21 000	1	21,000	Francis	514	661-620	634	MS	W	Welded pl st	Butterfly	17,647	Automatic	AG	0.85	7.2	60	WE
36 000			36 000	1	36,000	Francis	450	750-745	742	MS	W	Steel	Butterfly	30,588	Automatic	AG	0.85	11.5	60	GE
40,000			40,000	1	40,000	Francis	400	756-745	710	AC	W	Welded pl st	Butterfly	30,527	Automatic	AG	0.95	11.5	60	WE
46,000			46 000	1	46,000	Francis	400	727-704	705	AC	W	Welded pl st	Butterfly	34,737	Automatic	AG	0.95	11.5	60	WE
140 000			140 000	2	70,000	Francis	163.6	375-225	285	BL	W	Plate st	Head gt	55,555	Manual	BG	0.90	13.8	60	WE
26,500			26,500	1	26,500	Francis	163.6	98-73	91	BL	W	Plate st	Head gt	20,000	Automatic	BG	0.90	13.8	60	WE
157,500			157,500	3	52,500	Francis	128.6	233-126	185	PW	W	Plate st	Head gt	42,222	Manual	BG	0.90	13.8	60	GE
20,700			20 700	1	20,700	Kaplan	128.6	58-51	51	NN		Concrete	Head gt	15,000	Automatic	BG	1.00	13.8	60	GE
5,300			5,300	1	5,300	Impulse	400		690	PW	PW		Spherical	4,500	Automatic	AG	0.85	2.4	60	GE
128 400			128,400	2	64 200	Francis	225	382-367	349	NN	W	Welded pl st	Butterfly	50,000	Manual	AG	0.90	13.8	60	GE
222,000			222,000	3	74,000	Francis	163.6	340-145	300	NN		Plate st	Head gt	60,000	Manual	AG	0.90	13.8	60	WE
18 800			18 800	2	9,400	Kaplan	150	51-20	42	MS	PW	Concrete	Head gt	7,500	Manual	AG	0.90	4.16	60	EC
15 000			15,000	2	7,500	Kaplan	100	25.5	25.5	BL	W	Concrete	Head gt	6,500		BG	0.80	6.9	60	GE
480			480	1	480	Impulse	1,775	1,085	1,085	MS			Drives power-recovery unit							
7 000			50,000	2	25,000	Francis	600	870-780	800	NN	W	Cast steel	Butterfly	16,667	Manual	AG	0.90	6.9	60	OCL
7,200			7,200	2	3 600	Impulse	360		760	MS				2,500	Manual	HS	0.80	2.4	60	GE
1,500			1 500	1	1,500	Impulse	300		255	PW	W			1,250	Manual	AG	0.80	6.9	60	GE
34 000			34 000	1	34 000	Impulse	257	878-793	740	PW	W	Cast st	Spherical	25,000	Auto. or man.	AG	0.80	13.8	60	WEI
13,500			13,500	2	6,750	Francis	514	348-240	310	JL	W	Cast st	Roto	5,000	Auto. or man.	AG	0.90	4.16	60	WEI
16,200			18 900	2	2,700	Francis	231	35	35	MS		Concrete	Head gt	2,256	Manual	HS	0.90	6.9	50	CWC
10 000			10,000	1	10,000	Francis	450	290	276	DEC	W	Plate st	Butterfly	9,000	Automatic	AG	0.85	6.9	60	CGE
12,000			12,000	2	6,000	Propeller	150	34	34	CAC	W	Concrete	Head gt	5,000	Manual	AG	0.85	6.9	60	CWC
9 000			9,000	1	9,000	Francis	600	405	362	DEC	W	Cast steel	Butterfly	8,500	Automatic	AG	0.80	6.9	60	CWC
27 000			27 000	2	13,500	Kaplan	225	80-66	75	MSC	W	Plate st	Head gt	12,500	Manual	AG	0.80	6.9	60	CGE
				Beauharnois No. 1 completed in 1949, has 758,000 hp installed in 14 – 53,000-hp and 2 – 8,000-hp units																
503 000	2	1953	2,136 000	{6	53,000	Francis	75	82-75	80	CAC	W	Concrete	Head gt	51,000	Automatic	AG	0.80	13.8	60	5 CWC
				{6	53,000	Francis	75	82-75	80	DEC	W	Concrete	Head gt	51,000	Automatic	AG	0.80	13.8	60	7 CGE
32,000			64 000	2	16,000	Francis	120	69-64	68	DEC	W	Concrete	Head gt	15,000	Manual	BG	0.85	6.9	60	CWC
600 000			1,200 000	4	150,000	Francis	277	875-850	785	EEC	W	Plate st	Spherical	120 000	Automatic	AG	0.95	13.8	60	MVE
285 000			285 000	5	57 000	Francis	105.9	115-95	116	DEC	W	Concrete	Head gt	53,500	Manual	AG	0.70	13.8	60	CGE
325 000	1	1955	390,000	6	65 000	Francis	125.6	160	160	DEC	W	Plate st	Head gt	53,000	Automatic	AG	0.90	13.8	60	CGE
200 000	1	1955	244 500	{5	40,000	Francis	109.1	117-93	108	DEC	DEC	Plate st	Head gt	36,000	Manual	BG	0.85	11.0	60	CWC
				{1	44 500	Francis	109.1	117-93	108	DEC	W	Plate st	Head gt	36,000	Manual	BG	0.85	11.00	60	SGE
178 000	1	1955	222 500	{5	44,500	Francis	109.1	114-104	114	DEC	DEC	Plate st	Head gt	40 000	Manual	AG	0.90	11.0	60	CGE
				{1	49 000	Francis	112.5	114-104	114	DEC	W	Plate st	Head gt	40,000	Manual	AG	0.90	11.0	60	CGE
26 000			26 000	2	13 000	Francis	200	122-70	100	CAC	W	Plate st	Butterfly	11,000	Manual	AG	0.80	13.8	60	CGE
4,500			4 500	2	2,250	Francis	370	64	64	DEC		Plate st	Head gt	2,000	Manual	BG	0.80	2.3	50	NEC
35 000			70 000	2	35 000	Francis	277	338	338	CAC	W	Plate st	Butterfly	35,000	Automatic	AG	0.85	13.8	60	CWC
9 000			9 000	1	9,000	Propeller	180	46	46	CAC	W	Concrete	Head gt	7,500	Automatic	AG	0.85	6.9	60	CGE
1,200 000	4	1955	1 600 000	12	100,000	Francis	150	305-294	292	DEC	W	Plate st	Head gt	{80 000	Automatic	AG	0.95	13.8	60	8 CGE
														{80,000	Automatic	BG	0.95	13.8	60	4 CWC
82 900	2	53-54	164 000	{2	41,000	Francis	109.1	110-106	106	CAC	W	Plate st	Head gt	33 000	Manual	AG	0.90	13.8	60	CWC
				{2	41,000	Francis	109.1	110-100	105	MSC	W	Plate st	Head gt	35,000	Manual	BG	0.90	13.8	60	CWC
16 000			16 000	6	2 000	Propeller	200	29	29	CVL	W	Concrete	Head gt	2,000	Manual	AG	0.8	6.9	60	CGE
15 000			15 000	2	7,500	Kaplan	200	50-47	46	MSC	W	Concrete	Head gt	9 000	Manual	AG	1.00	11.5	60	CGE
80 900	4	1955	80 200	8	10,000	Propeller	85.7	25.5	23.5	DEC	W	Concrete	Head gt	8,500	Automatic	BG	0.90	6.9	60	CGE
21 600			21 600	3	21 600	Kaplan	128.6	56-24	48	KMW	KMW	Concrete	Head gt	18 000	Automatic	BG	0.85	13.8	60	CWC
37 450			67 450	1	30,000	Francis	150	97-92	107	EEC	W	Plate st	Head gt	25,000	Automatic	BG	0.85	13.8	60	CWC
				{1	140,000	Impulse	327	2,570	2,500	DEC	W	Cast steel	Butterfly	100 000	Manual	AG	0.80	13.8	60	EEC
429 000			2,049 000	{4	140 000	Impulse	327	2,570	2,500	CAC	W	Cast steel	Butterfly	100 000	Manual	AG	0.80	13.8	60	CGE
				{4	140,000	Impulse	327	2,570	2,500	PW&VEW	PW	Cast steel	Butterfly	100 000	Manual	AG	0.80	13.8	60	CWC
186 000	1	1954	629 000	{12	60 000	Impulse	300		1,130	PW&VEW	W	Cast steel	Spherical	50 000	Manual	AG	0.90	13.8	60	CWC
				{1	50,000	Impulse	300		1,130	PW&VEW	PW	Cast steel	Spherical	50,000	Manual	AG	0.90	13.8	60	CWC
58 500			58,500	1	58,500	Francis	120	164-129	147	CAC	W	Plate st	Head gt	40 000	Automatic	BG	1.00	13.8	60	CWC
240,000			480,000	8	120 000	Francis	120	215-171	220	DEC	W	Plate st	Butterfly	90 000	Manual	BG	0.85	13.8	60	CWC
56 000	4	50-53	168 000	6	28 000	Francis	327.3	435-352	390	DEC	W	Plate st	Butterfly	25,000	Manual	AG	0.80	13.8	60	CWC
35 000			35 000	1	35,000	Francis	277	364-355	345	CAC	W	Plate st	Pivot	30 000	Automatic	AG	0.90	13.8	60	CWC
				{3	3 000	Francis	600	220-215	217	EEC	W	Plate st	Pivot	2,750	Manual	HS	0.90	4.16	60	EEC
5 500			8 500	{2	1,250	Francis	600	220-215	217	EEC	W	Plate st	Pivot	1,250	Manual	HS	0.80	4.16	50	EEC
3,200			3 200	1	3,200	Francis	300		429	CVL		Cast steel		2,500	Manual	HS	0.80	6.9	60	EC

JL – James Leffel & Co
KMW – KMW of Sweden
MS – S Morgan Smith Co
MSC – S Morgan Smith, Canada Ltd
MVE – Metropolitan Vickers Electrical Co Ltd
NEC – Northern Electric Co Ltd
NN – Newport News Shipbuilding & Dry Dock Co
OCL – Oerlikon, Canada Ltd
PC – Pacific Oerlikon Co
PW – Pelton Water Wheel Co
SGE – Swedish General Electric Co Ltd
VEW – Vancouver Engineering Works Ltd
W – Woodward Governor Co
WE – Westinghouse Electric Corp
WEI – Westinghouse Electric International Co

[4] AG, indicates thrust bearing is above generator rotor; BG, thrust bearing is below generator rotor; HS, horizontal-shaft machine.

[5] Dam, tunnels with steel pipe conduits are being built for the New York Board of Water Supply as part of the Delaware River water system.

[6] Two power plants are being built, one in Mexico and one in the United States, each with three 14,750-hp units.

[7] Vertical-shaft 6-nozzle type.

[8] Was Fulton Shoals.

Government-Agency Hydroelectric Plants

(Does not include municipal plants)

Government Agency	Project	State or Possession	River	Ultimate capacity, hp	Initial capacity, hp	Installed capacity, hp	On order or being installed, hp
U. S. Bureau of Reclamation	Eklutna	Alaska	Lake Eklutna	50,000	50,000		50,000
	Grand Coulee	Wash.	Columbia	3,102,000	538,000	3,102,000	
	Hungry Horse	Mont.	So. Fork	420,000	420,000	420,000	
PUD No. 1, Chelan County	Rock Island	Wash.	Columbia	288,000	84,000	288,000	
U. S. Corps of Engineers	Bonneville	Ore. & Wash.	Columbia	729,000	137,000	729,000	
	Big Cliff	Ore.	North Santiam	25,500	25,500		25,500
	Lookout Point	Ore.	Mid. Fk. Willamette	157,500	157,500		157,500
	Detroit	Ore.	North Santiam	140,000	140,000	140,000	
	Dexter	Ore.	Mid. Fk. Willamette	20,700	20,700		20,700
	Chief Joseph	Wash.	Columbia	2,700,000	1,600,000		1,600,000
	Dalles	Ore. & Wash.	Columbia	2,761,000	1,770,800		1,770,800
	McNary Dam	Ore. & Wash.	Columbia	2,226,500	1,567,200	222,600	1,344,600
	Albeni Falls	Idaho	Pend Oreille	58,800	58,800		58,800
PUD No. 1, Pend Oreille County	Box Canyon	Wash.	Pend Oreille	122,500	98,000		98,000
U. S. Bureau of Reclamation	Anderson Ranch	Idaho	Boise	55,500	37,000	37,000	
	Minidoka	Idaho	Snake	25,500	9,000	19,500	
	Palisades	Idaho	Snake	158,000	158,000		158,000
	Shasta	Calif.	Sacramento	522,000	419,000	522,000	
	Keswick	Calif.	Sacramento	102,000	102,000	102,000	
	Folsom	Calif.	American	225,000	225,000		225,000
Imperial Irrigation District	Drop No. 4	Calif.	All-Am. Canal	28,300	13,300	28,300	
U. S. Bureau of Reclamation	Parker Dam	Ariz. & Calif.	Colorado	160,000	120,000	160,000	
	Davis Dam	Ariz. & Calif.	Colorado	311,000	311,000	311,000	
	Hoover Dam	Ariz. & Nev.	Colorado	1,857,000	522,000	1,742,000	
	Elephant Butte	N.M.	Rio Grande	34,500	34,500	34,500	
	Green Mountain	Colo.	Blue	30,000	30,000	30,000	
	Estes Park	Colo.	Colo. Big Thompson	63,000	63,000	63,000	
	Pole Hill	Colo.	Colo. Big Thompson	47,500	47,500		47,500
	Flatiron	Colo.	Colo. Big Thompson	108,000	108,000		108,000
	Kortes	Wyo.	North Platte	55,500	55,000	55,000	
	Boysen	Wyo.	Big Horn	21,000	21,000	21,000	
	Alcova	Wyo.	North Platte	53,000	53,000		53,000
	Seminoe	Wyo.	North Platte	45,000	45,000	45,000	
	Canyon Ferry	Mont.	Missouri	70,500	70,500	23,500	47,000
U. S. Corps of Engineers	Fort Peck	Mont.	Missouri	150,300	70,000	120,000	
Platte Valley Public Pwr. & Irr. Dist.	Sutherland	Neb.	North Platte	35,000	35,000	35,000	
Loup River Public Power Dist.	Columbus	Neb.	Loup	54,000	54,000	54,000	
Central Neb. Public Pwr. & Irr. Dist.	Jeffery Canyon	Neb.	Platte	26,000	26,000	26,000	
	Johnson No. 1	Neb.	Platte	26,000	26,000	26,000	
	Johnson No. 2	Neb.	Platte	50,000	25,000	25,000	
U. S. Corps of Engineers	Fort Randall	S. D.	Missouri	460,000			460,000
	Oahe	S. D.	Missouri	485,000	194,000		
	Garrison	N. D.	Missouri	440,000	440,000		440,000
	Garvins Point	S. D. & Neb.	Missouri	162,000	162,000		162,000
	St. Mary's Falls	Mich.	St. Mary's	72,750	23,925	23,325	
	Norfolk	Ark.	North Fork	168,000	42,540	84,540	
	Blakely Mountain	Ark.	Ouachita	104,000	104,000		
	Bull Shoals	Ark.	White	419,000	211,000	211,000	
	Table Rock	Ark.	White	272,000	272,000		
	Narrows	Ark.	Little Missouri	36,000	24,000	24,000	
Grand River Dam Authority	Pensacola Dam	Okla.	Grand	120,750	90,750	120,750	
U. S. Corps of Engineers	Fort Gibson	Okla.	Grand	96,000	64,000	64,000	
	Tenkill Ferry	Okla.	Illinois	47,000	47,000	47,000	
	Dennison Dam	Okla. & Texas	Red	282,080	56,080	114,080	
Lower Colorado River Authority	Buchanan Dam	Texas	Colorado	51,900	34,600	51,900	
	Marshall Ford	Texas	Colorado	90,000	90,000	90,000	
	Granite Shoals	Texas	Colorado	66,000	66,000	66,000	
	Marble Falls	Texas	Colorado	42,000	42,000	42,000	
Brazos River Conserv. & Reclam. Dist.	Possum Kingdom	Texas	Brazos	51,000	34,000	34,000	
International Boundary & Water Comm.	Falcon Dam	Texas & Mex.	Rio Grande	88,500	88,500	88,500	
U. S. Corps of Engineers	Whitney Dam	Texas	Brazos	41,400	41,400	41,400	
	Wolf Creek	Ky.	Cumberland	377,000	377,000	377,000	
Tennessee Valley Authority	Kentucky	Ky.	Tennessee	220,000	176,000	220,000	
	Pickwick	Tenn.	Tennessee	382,200	96,000	382,200	
	Wilson	Ala.	Tennessee	630,000	206,000	630,000	
	Wheeler	Ala.	Tennessee	360,000	90,000	360,000	
	Guntersville	Ala.	Tennessee	141,000	102,000	141,000	
	Hales Bar	Tenn.	Tennessee	140,000	72,000	140,000	
	Chickamauga	Tenn.	Tennessee	144,000	106,000	144,000	
	Watts Bar	Tenn.	Tennessee	210,000	126,000	210,000	
	Norris	Tenn.	Clinch	132,000	132,000	132,000	
	Fort Loudoun	Tenn.	Tennessee	176,000	88,000	176,000	
	Cherokee	Tenn.	Holston	156,000	93,000	156,000	
	Douglas	Tenn.	French Broad	154,000	83,000	118,500	35,500
	South Holston	Tenn.	South Holston	49,500	49,500	49,500	
	Fort Patrick Henry	Tenn.	So. Fork Holston	50,000	50,000	50,000	
	Boone	Tenn.	So. Fork Holston	103,500	103,500	103,500	
	Watauga	Tenn.	Watauga	69,000	69,000	69,000	
	Fontana	N. C.	Little Tennessee	274,500	183,000	274,500	
	Apalachia	Tenn.	Hiwassee	196,000	196,000	196,000	
	Hiwassee	N. C.	Hiwassee	150,000	80,000	80,000	80,000
	Nottely	Ga.	Nottely	21,000	21,000		21,000
	Ocoee No. 3	Tenn.	Ocoee	33,500	33,500	33,500	
	Ocoee No. 2	Tenn.	Ocoee	25,000	25,000	25,000	
U. S. Corps of Engineers	John H. Kerr	Va. & N. C.	Roanoke	290,000	290,000	290,000	
	Central Hill	Tenn.	Caney Fork	188,750	188,750	188,750	
	Dale Hollow	Tenn.	Obey	55,000	50,000	55,000	
	Cheatham	Tenn.	Cumberland	130,000	130,000		130,000
	Allatoona	Ga.	Etowah	102,900	102,900	102,900	
	Buford	Ga.	Chattahoochee	113,400	113,400		113,400
	John Woodruff	Ga.	Chattahoochee	42,000	42,000		42,000
	Clark Hill	Ga. & S. C.	Savannah	388,600	388,600	388,600	
U. S. Corps of Engineers & Santee Cooper Authority	Santee Cooper	S. C.	Santee	215,220	175,720	175,720	
Southwestern Power Administration	Bull Shoals	S. C.	Dakota	22,200	22,200	22,200	
Total (Incl. ...)				25,665,885	15,508,320	14,739,700	2,482,740

NOTE: Exclusive of plants with installations of 10,000 hp capacity and below totaling 207,300 hp. have been omitted.