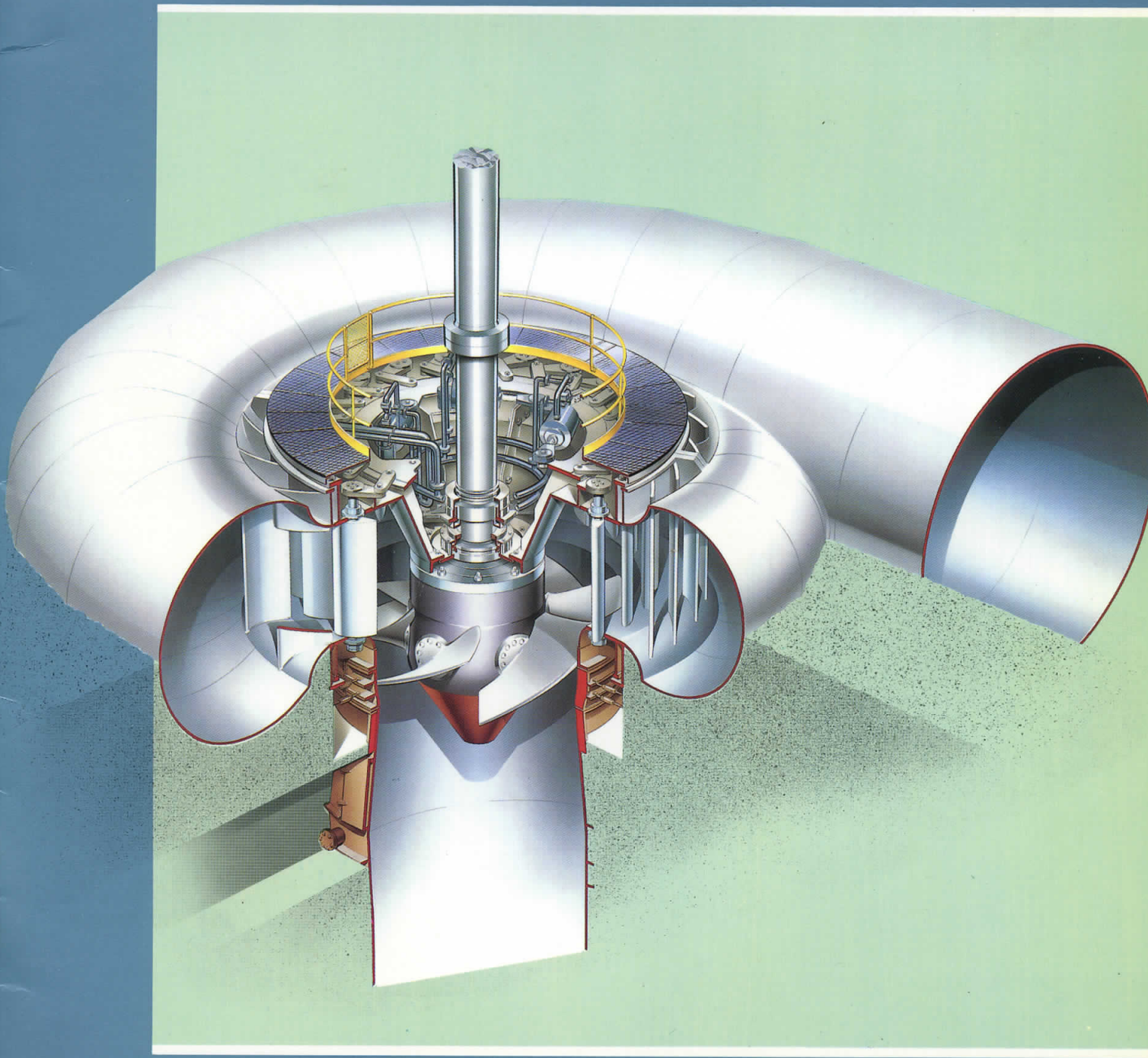
Kvaerner Hydro

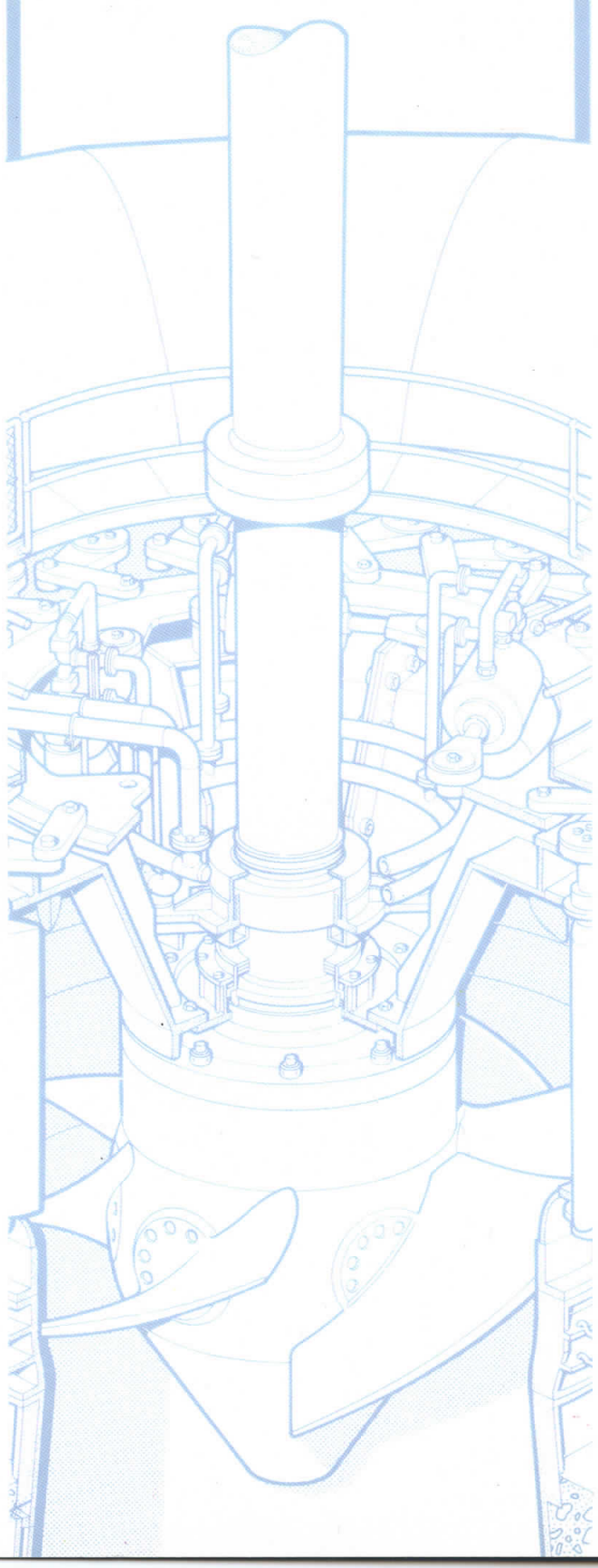
KVÆRNER

KAPLAN TURBINES



REFERENCE LIST

KAPLAN TURBINES



KVÆRNER

KAPLAN TURBINES

Kvaerner Hydro is the organisation comprising those divisions within Kværner Brug A/S of Norway, which are concerned with Hydro Electric Power and Water Control applications and its subsidiaries Sörumsand Verksted A/S in Norway, NOHAB-KMW Turbin AB in Sweden, Kvaerner Hydro Power Inc. in the U.S.A. and Boving & Co. Limited and Boving Newton Chambers Ltd., in the United Kingdom.

Kværner Brug is one of the main companies of the privately owned Kvaerner Industrier A/S, which is amongst the largest industrial groups in Norway, with activities ranging from oil and gas to fish processing and environmental protection as well as shipping and shipbuilding.

The operation of all the Kvaerner Hydro companies is closely co-ordinated and the technology and experience of each is available to all. Products available include:

Hydro turbines	Pelton, Francis, Reversible Pump, Kaplan, Propeller and Bulb.
Valves	Spherical, Butterfly and Flow Control Valves.
Governors	All electro-hydraulic types
Penstocks	Surface mounted or covered, tunnel and pressure shaft linings, bifurcations and trifurcations.
Gates	All Hydro Power and Water Control types.
Trash Rack Cleaning Equipment	Various types and sizes.
Fishway Services	Fish Passes and Fish Gates

Services, Repair, Refurbishment and Upgrading

Training
All services associated with hydro installations.

Since 1848, when our first turbine was delivered, Kvaerner Hydro companies have delivered thousands of hydro turbines, totalling over 80,000 MW in output. Continuous improvement and development enables us to offer hydro turbines of all types and associated mechanical equipment of the most modern design for the smallest as well as the largest projects.

Hydraulic and mechanical research, development and design is carried out in our modern laboratories and by experienced engineers using the latest computer techniques.

Brochures giving descriptions of our laboratory facilities and all of our products are available on request.

KVÆRNER

KAPLAN TURBINES

We have been a major designer and manufacturer of water turbines for over one hundred years. One of our significant achievements was the practical development of the Kaplan turbine starting in 1922 and resulting in the unit at Lilla Edet in Sweden which was the first large dimension Kaplan turbine in the world.

The brochure on our Hydraulic Turbine Laboratory illustrates our excellent facilities for model testing Kaplan turbines.

The mechanical design of Kaplan turbines has proceeded in parallel to the hydraulic development and we are able to supply all sizes of this type of turbine.

The reference list gives the main design data of all Kaplan turbines with an output of more than 10MW ordered since 1946 which have been designed and/or manufacutured completely or partly by ourselves.

Column headings in the table refer to:

Year:	The year in which the order was received.
Head:	Rated net head.
Output:	Maximum power developed during continuous operation.
Runner diameter:	The maximum diameter of the blades.

*	Denotes a joint project order in collaboration with another manufacturer.
**	Runners only supplied.
***	Propeller (fixed blades).

SOME NOTABLE EARLY INSTALLATIONS

Year	Power Station	Country	Head m	Output MW	Notes
1922	Lilla Edet	Sweden	6.5	8.2	Runner diameter 5.8m. The first Kaplan turbine in the world of large dimensions.
1929	Swir	USSR	11	27.6	Runner diameter 7.0m. Largest dia. and output in the world for a Kaplan turbine at that time.
1931	Wargön	Sweden	4.3	11.2	Runner diameter 8.0m. The largest dimensions in the world at that time.
1937	Stadsforsen	Sweden	27.8	35	In respect of output among the biggest in Europe for a Kaplan turbine at that time.
1939	Hojum	Sweden	31	47	The highest head and largest output for a Kaplan turbine in Sweden at that time.

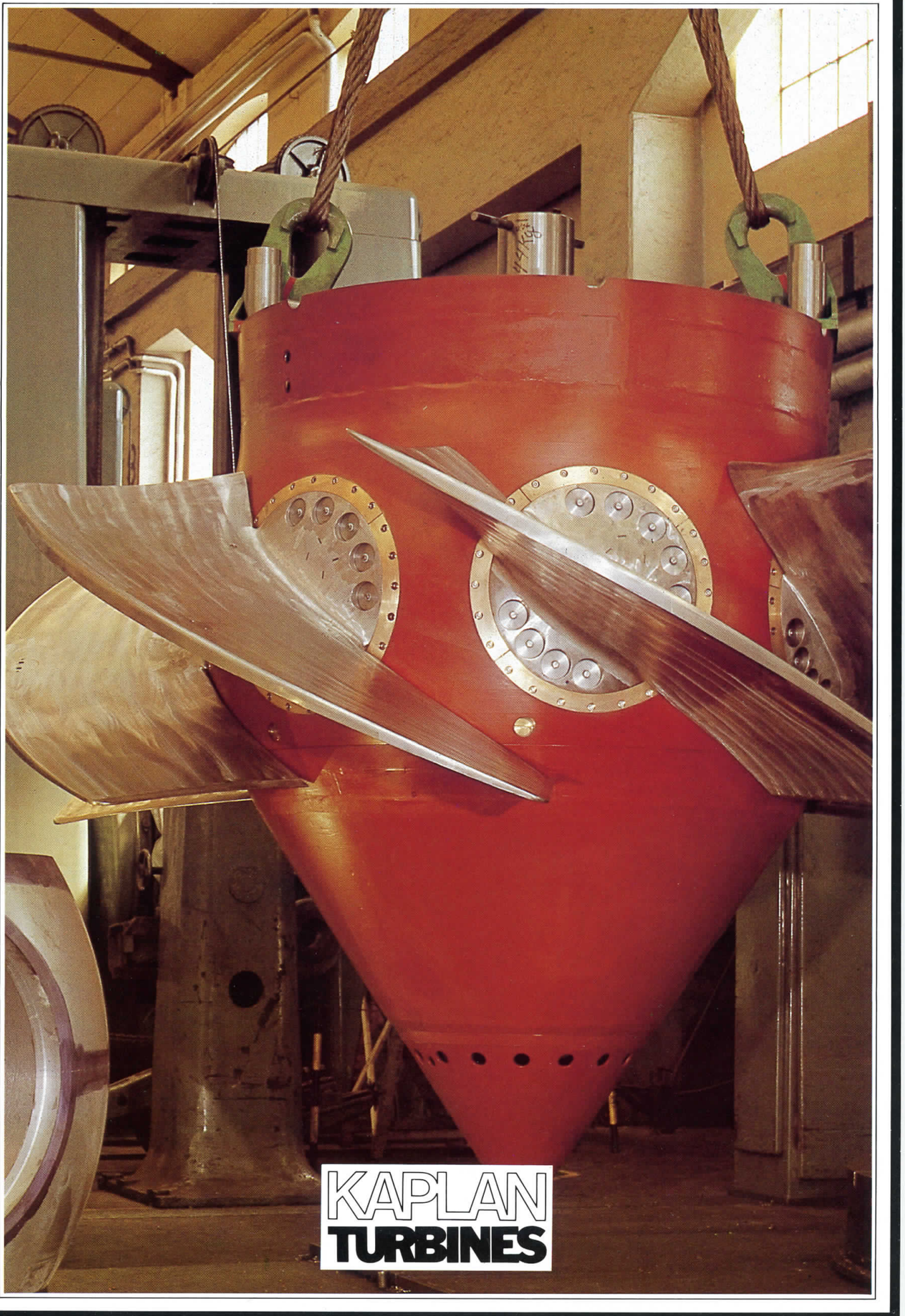
Year	Customer	Power Station/Country	Number of Units	Head m.	Output per unit MW	Speed r.p.m.	Runner dia. m.	Notes
1946	Swedish State Power Board	Hölleforsen, Sweden	3	27.0	45.0	125.0	5.51	
1946	Hammarforsens Kraft AB	Hammarforsen Sö, Sweden	2	19.0	22.5	136.4	4.45	
1946	Billeruds AB	Jössefors, Sweden	1	23.0	28.0	136.4	4.45	
1946	Electricity Supply Board	Cathaleen's Falls, Ireland	2	28.2	23.3	187.5	3.82	
1946	Stora Kopparbergs Bergslag AB	Gråda, Sweden	2	11.5	11.3	115.0	4.56	
1946	Tammerfors Linne-och-Jern Manufaktur Aktie-Bolag	Mankala, Finland	3	9.9	10.33	107.1	4.67	**
1946	Tammerfors Linne-och-Jern Manufaktur Aktie-Bolag	Kuusankosi, Finland	1	10.0	10.96	107.1	4.67	**
1946	Tammerfors Linne-och-Jern Manufaktur Aktie-Bolag	Pyhakoski, Finland	1	32.8	38.79	150.0	4.56	**
1946	Pakistan Water and Power Development Authority	Rasul, Pakistan	2	24.5	11.50	214.3	2.97	
1947	V/O Machinoimport	Jäniskoski, USSR	2	21.5	14.7	187.5	3.60	
1947	Swedish State Power Board	Stadsforsen 3, Sweden	1	27.8	45.0	125.0	5.51	
1947	Skellefteå Stads Kraftverk	Granfors, Sweden	1	17.7	16.0	136.4	4.13	
1947	V/O Machinoimport	No. 1468683, USSR	2	12.8	15.0	107.1	4.87	
1947	Egyptian Government	Aswan Dam, Egypt	5	27.0	47.8	100.0	5.83	
1947	Swedish State Power Board	Forsmo, Sweden	1	35.0	31.33	167.0	4.20	
1948	Uganda Electricity Board	Owen Falls, Uganda	4	19.0	16.6	150.0	4.14	
1948	Swedish State Power Board	Forsmo, Sweden	1	35.0	31.33	167.0	4.20	
1948	Kraft AB Ljusne Strömmar	Ljusne, Sweden	2	16.05	16.86	125.0	4.65	
1948	Sundsvallsbolagens Gemensamma Förvaltnings AB	Skallböle, Sweden	2	20.5	12.16	166.7	3.40	
1949	Bergeforsens Kraft AB	Bergeforsen, Sweden	3	22.8	39.0	115.4	5.51	
1950	Skellefteå Stads Kraftverk	Finnfors, Sweden	1	20.0	18.2	136.4	4.13	
1950	Harrsele Kraft AB	Pengfors, Sweden	2	14.7	21.0	125.0	4.67	
1950	Gulsele AB	Gulsele, Sweden	2	27.5	20.7	187.5	3.60	
1950	V/O Machinoimport	Kegum 4, USSR	1	15.9	18.8	107.1	4.87	
1950	Swedish State Power Board	Ligga, Sweden	2	39.5	77.7	125.0	5.83	
1951	A/S Union (Union Co.)	Skotfos, Norway	1	10.0	11.8	107.1	4.77	

Guide vane and runner blade for 8.3 m runner diametet Kaplan turbine

Year	Customer	Power Station/Country	Number of Units	Head m.	Output per unit MW	Speed r.p.m.	Runner dia. m.	Notes
1951	Uganda Electricity Board	Owen Falls, Uganda	2	19.0	16.6	150.0	4.14	
1952	Calgary Power Ltd. through Hydro Turbine Co. Ltd.	Bearspaw, Canada	1	14.7	15.3	128.6	4.45	
1952	Skandinaviska Elverk	Dőnje, Sweden	2	30.5	19.5	187.5	3.40	
1952	Swedish State Power Board	Midskog 3, Sweden	1	26.5	56.3	115.4	6.04	
1953	Swedish State Power Board	Forsmo, Sweden	2	34.0	43.0	167.7	4.40	
1953	Swedish State Power Board	Umluspen, Sweden	2	30.0	52.8	150.0	4.88	
1954	Gulsele AB	Gulsele 3, Sweden	1	27.5	20.7	187.5	3.60	
1954	Pengfors AB	Pengfors 3, Sweden	1	14.7	21.0	125.0	4.67	
1954	Bålforsens Kraft AB	Bålforsen, Sweden	2	31.0	43.0	150.0	4.61	
1954	Uganda Electricity Board	Owen Falls, Uganda	2	19.0	16.60	150	4.14	
1954	AB Svarthålsforsen	Svarthålsforsen, Sweden	3	15.2	22.73	107.0	5.40	
1955	A/S Viul Træsliberi	Viul, Norway	1	17.0	10.3	167.7	3.40	
1956	Bergeforsens Kraft AB	Bergeforsen 4, Sweden	1	22.8	39.0	115.4	5.51	
1956	Electro Quimica Brasiliera SA	Brecha, Brazil	1	20.6	15.1	180.0	3.60	
1956	Swedish State Power Board	Jărkvissle, Sweden	2	13.6	50.4	75.0	7.53	
1956	Bjurfors AB	Bjurfors Nedre, Sweden	3	19.5	29.3	125.0	4.77	
1956	State Hydro-Electric Department	Waipapa, New Zealand	3	16.2	17.9	125.0	4.88	
1956	Swedish State Power Board	Lasele, Sweden	2	52.0	64.1	150.0	4.80	
1957	Graningeverkens AB	Kvistforsen, Sweden	2	49.3	71.6	150.0	4.88	
1957	Vesterdalelfvens Kraft AB	Mockfjărd, Sweden	1	26.0	22.7	187.5	3.60	
1957	Skellefteå Kraft AB	Båtfors, Sweden	2	16.9	20.8	125.0	4.67	
1957	Damodar Valley Corporation	Panchet Hill, India	1	24.7	41.0	125.0	5.40	
1958	Iron Ore Company of Canada Ltd. through A. Johnson & Co. (Canada) Ltd.	Menihek, Canada	1	12.2	10.6	150.0	3.92	
1958	Örebro Elektriska AB	Långströmmen, Sweden	2	36.0	26.2	187.5	3.60	
1958	Holmens Bruks och Fabriks AB	Junsterforsen, Sweden	1	36.0	35.7	187.5	3.70	
1958	Swedish State Power Board	Vargfors, Sweden	1	48.0	80.7	150.0	4.88	

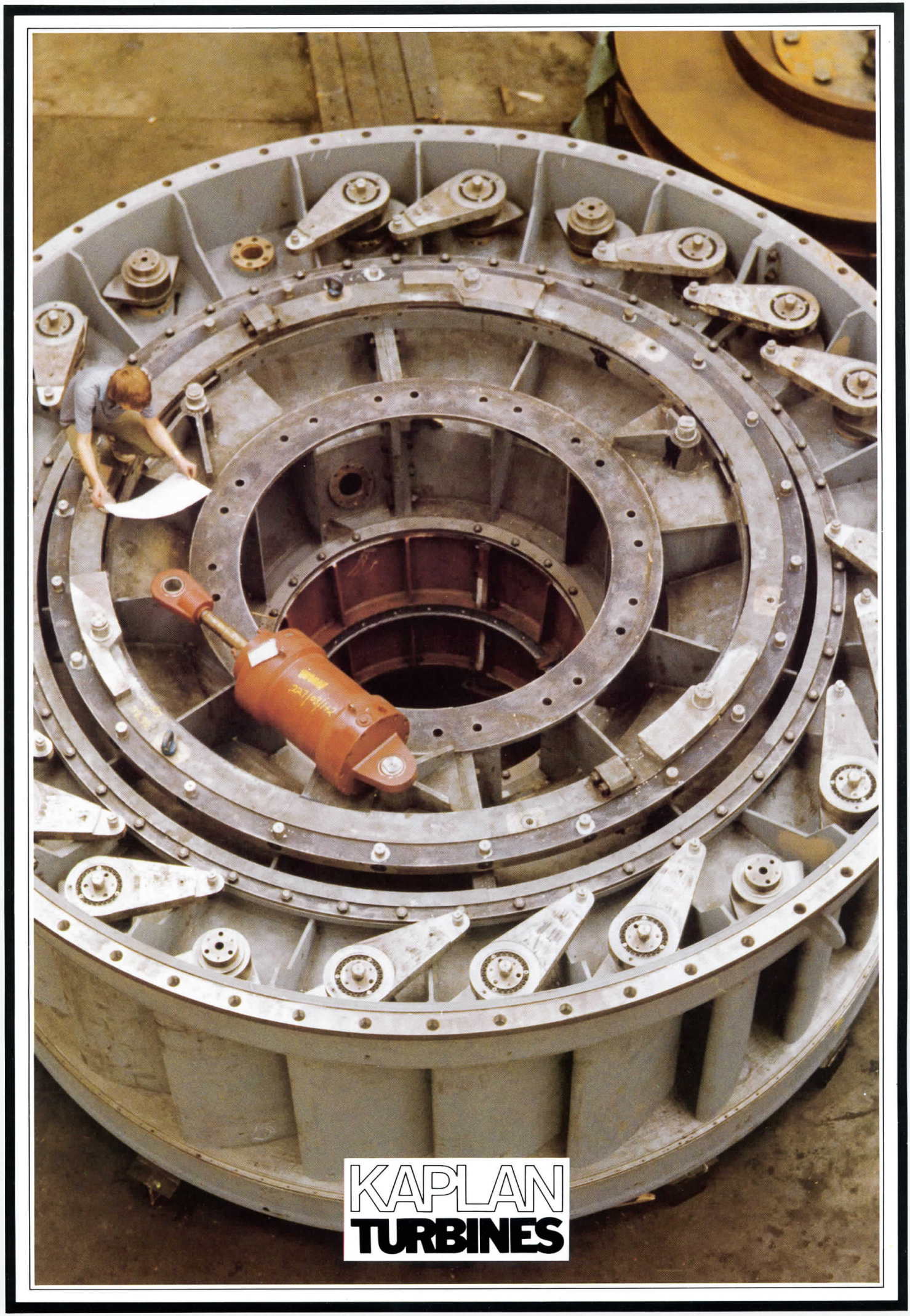
Roseires Runner

Year	Customer	Power Station/Country	Number of Units	Head m.	Output per unit MW	Speed r.p.m.	Runner dia. m.	Notes
1958	Swedish State Power Board	Rusfors, Sweden	1	11.7	49.0	71.4	8.10	
1959	Bjurfors AB	Bjurfors Övre, Sweden	3	11.1	17.4	107.1	4.88	
1959	Swedish State Power Board	Laxede, Sweden	2	25.4	71.7	107.1	6.50	
1959	North of Scotland Hydro-Electric Board	Aigas, Scotland	2	16.2	10.4	187.5	3.34	
1959	North of Scotland Hydro-Electric Board	Kilmorack, Scotland	2	16.2	10.4	187.5	3.34	
1959	North of Scotland Hydro-Electric Board	Inverawe, Scotland	1	29.3	31.4	166.7	4.06	
1959	Administración General de las Usinas Eléctricas y los Teléfonos del Estado U.T.E.	Rincon de Baygorria, Uruguay	3	14.7	35.0	79.0	6.70	
1960	A/S Drammenselvens Papirfabrikker	Geithusfoss, Norway	1	9.5	12.8	100.0	4.88	
1960	Fuerzas Eléctricas de Cataluña, SA	Termens, Spain	1	26.0	11.7	250.0	2.75	
1960	Fuerzas Eléctricas de Cataluña, SA	Lerida, Spain	1	26.8	12.1	250.0	2.75	
1960	Stockholms Superfosfat Fabriks AB	Storåströmmen, Sweden	2	17.2	16.0	166.7	3.70	
1961	Norrånge Kraft AB och Arbrå Kraftverk	Norrånge, Sweden	2	21.0	26.4	136.4	4.35	
1961	Stora Kopparbergs Bergslag AB	Åsen, Sweden	1	22.0	25.7	150.0	4.05	
1961	Örebro Elektriska AB	Krokströmmen, Sweden	1	57.7	50.5	230.8	3.50	
1961	Sameiet Skogfoss Krafverk	Skogfoss, Norway	2	19.7	27.1	136.4	4.35	
1961	Hedmark Kraftverk	Lutufallet, Norway	1	13.7	14.7	150.0	4.10	
1961	Swedish State Power Board	Porsi, Sweden	2	33.0	74.3	115.0	6.30	
1961	Swedish State Power Board	Tuggen, Sweden	1	26.6	50.24	125.0	5.70	
1962	Edsele Kraftaktiebolag	Edsele, Sweden	2	26.5	33.0	166.7	4.10	
1962	Hydro Electricity Commission of Tasmania	Meadowbank, Australia	1	28.2	41.8	150.0	4.50	



Krokströmmen Runner (High head)

Year	Customer	Power Station/Country	Number of Units	Head m.	Output per unit MW	Speed r.p.m.	Runner dia. m.	Notes
1962	Hydro Electricity Commission of Tasmania	Repulse, Australia	1	25.2	29.1	136.4	4.50	
1962	Hydro Electricity Commission of Tasmania	Cluny, Australia	1	18.6	17.5	115.4	4.50	
1962	Swedish State Power Board	Tuggen, Sweden	1	26.6	50.24	125.0	5.70	
1963	Nord-Trőndelag Elektrisitetsverk, and Norges Vassdrags-og Elektrisitetsvesen	Rőyrvikfoss, Norway	1	28.5	16.1	250.0	2.90	
1963	Dynős AB	Borgforsen, Sweden	2	14.0	13.6	150.0	3.90	
1963	Sollefteåforsens AB	Sollefteå, Sweden	3	10.0	26.0	75.0	6.60	
1963	Fuerzas Eléctricas Del Noroeste S.A.	Velle, Spain	2	14.1	47.8	75.0	7.10	
1963	Fuerzas Eléctricas Del Noroeste S.A.	Castrelo, Spain	2	20.0	64.6	93.8	6.80	
1963	Fuerzas Eléctricas Del Noroeste S.A.	Frieira, Spain	2	23.5	79.4	93.8	6.80	
1963	Swedish State Power Board	Gardikfors, Sweden	1	39.0	60.62	150.0	5.00	
1963	Kraftlaget Opplandskraft	Hunderfossen, Norway	2	45.7	49.81	167.0	4.40	
1963	A/S Kykkelsrud and Oslo Lysverker	Kykkelsrud-Fossumfoss, Norway	2	25.0	55.0	115.4	5.75	
1964	Vősa Kraft AB	Vősa, Sweden	1	10.6	15.2	115.4	4.88	
1964	Stockholms Superfosfat Fabriks AB	Laforsen 3, Sweden	1	34.5	26.1	187.5	3.65	
1964	Krångede AB	Moforsen, Sweden	3	27.0	48.0	125.0	5.20	
1964	Uganda Electricity Board	Owen Falls, Uganda	1	19.0	16.6	150.0	4.14	
1964	Korsselbrőnna AB	Hőllforsen, Sweden	2	8.6	15.70	94.0	5.10	
1964	Kraftlaget Opplandskraft	Harpefoss, Norway	2	32.45	46.05	150.0	4.60	
1964	Norsk Hydro-Elektrisk Kvaelstofaktieselskab	Eidfoss, Norway	1	10.0	15.143	100.0	5.10	
1965	Trondheim Elektrisitetsverk	Gresslifoss, Norway	1	30.0	23.0	214.3	3.50	
1965	Tana River Development Co. Ltd.	Kindaruma, Kenya	2	35.1	23.9	214.3	3.25	
1965	Hidro-Eléctrica Do Douro	Carrapatelo, Portugal	3	31.0	70.0	115.4	5.80	
1965	Korsselbrőnna AB	Betsele, Sweden	2	9.5	17.47	94.0	5.10	
1965	Skellefteå Stads Kraftverk	Granfors, Sweden	1	18.5	17.6	150.0	4.10	
1966	Blybergs Kraft AB	Blyberg, Sweden	1	10.6	15.1	115.4	4.88	
1966	Swedish State Power Board	Grytfors, Sweden	1	21.2	32.0	136.4	4.80	

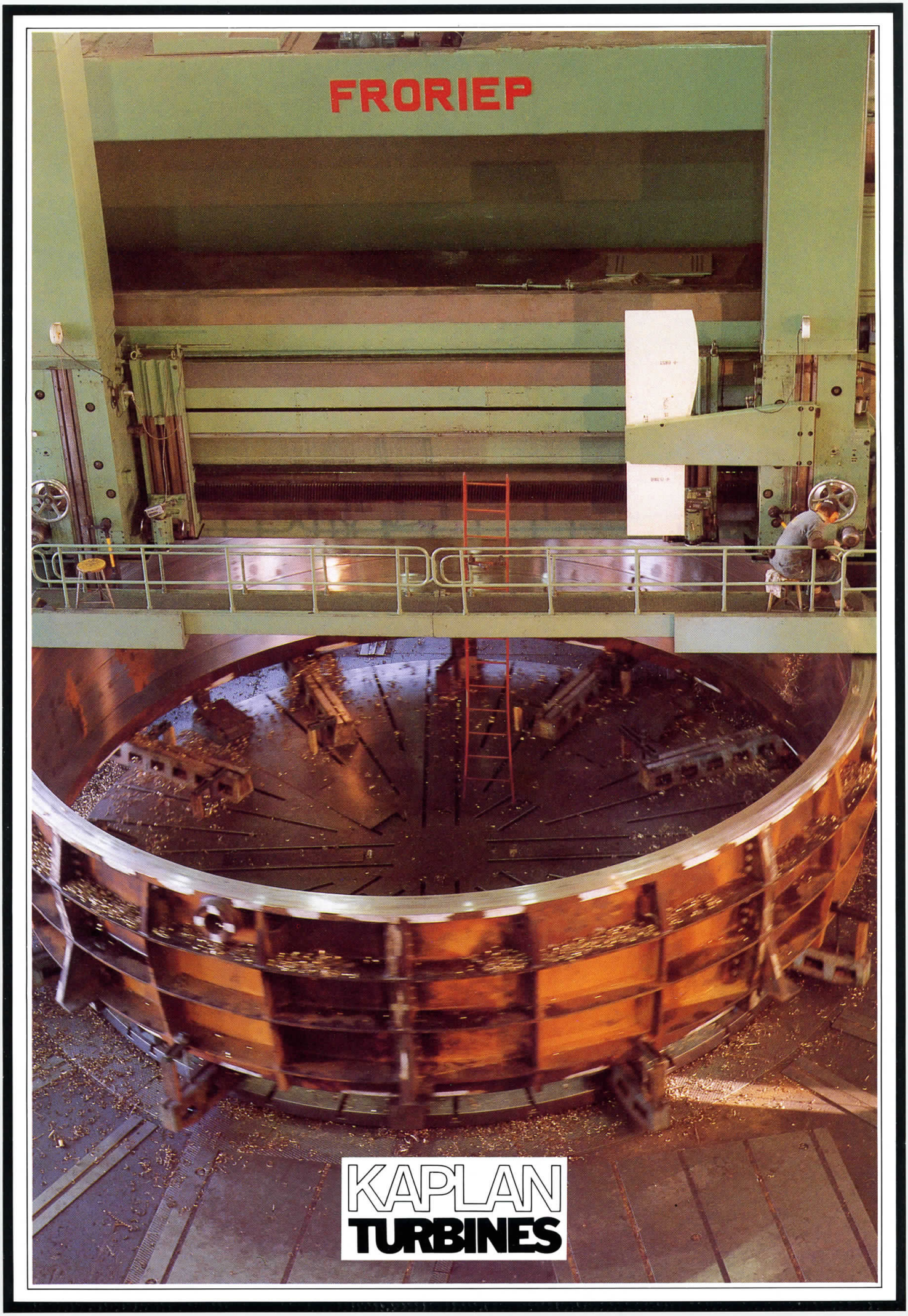


Assembly of Nagarjunasagar guide apparatus at Markhams of Chesterfield

Year	Customer	Power Station/Country	Number of Units	Head m.	Output per unit MW	Speed r.p.m.	Runner dia. m.	Notes
1966	Uganda Electricity Board	Owen Falls, Uganda	1	19.0	16.6	150.0	4.14	
1966	AB Skandinaviska Elverk	Dönje, Sweden	1	33.0	29.85	187.5	3.55	
1967	Gulsele AB	Hällby, Sweden	1	27.5	75.4	115.4	6.10	
1967	Hydro Electricity Commission of Tasmania	Paloona, Australia	1	30.8	31.2	187.5	3.93	
1967	Swedish State Power Board	Ajaure, Sweden	1	51.5	70.93	166.7	4.465	Diagonal Turbine
1967	Bergvik & Ala AB	Höljebro, Sweden	1	14.0	15.1	125.0	4.30	
1968	Spjutmo Kraft AB	Spjutmo, Sweden	1	20.1	37.5	136.4	5.05	
1968	Swedish State Power Board	Boden, Sweden	2	12.2	39.6	93.8	6.60	
1968	A/S Hafslund	Vamma, Norway	1	27.2	110.0	100.0	7.30	
1968	Hidro-Eléctrica do Douro	Regua, Portugal	3	25.3	14.9	107.1	6.10	
1968	Skellefteå Kraft AB	Rengård, Sweden	1	19.0	37.1	115.4	5.30	
1968	Hamar Vang og Furnes Komm. Kraftselskap	Löpet, Norway	1	18.0	25.6	136.4	4.67	
1968	Österreichische Donaukraftwerke AG	Wallsee, Austria	2	10.6	40.5	65.2	7.80	
1969	Gullspångs Kraftaktiebolag	Gullspång, Sweden	1	20.8	40.6	125.0	5.30	
1969	Swedish State Power Board	Akkats, Sweden	1	42.8	153.0	115.4	6.80	
1969	Centrais Elétricas do Pará S.A.	Curúa-Una, Brazil	3	21.7	10.3	200.0	3.10	
1969	Iberduero S.A.	Cernadilla, Spain	1	55.6	30.64	250.0	3.05	
1970	Swedish State Power Board	Nämforsen 3, Sweden	1	21.0	62.0	100.0	6.50	
1970	Skellefteå Stads Kraftverk	Krångfors, Sweden	1	29.5	26.8	187.5	3.90	
1970	A/S Vamma Fossekompagni	Vamma, Norway	1	27.2	110.0	100.0	7.30	
1972	China National Machinery Import and Export Corp.	Ba Pan Cha, Peoples Republic of China	3	18.0	44.0	115.4	5.50	
1973	Swedish State Power Board	Randi, Sweden	1	23.0	103.7	100.0	7.00	
1973	Gullspångs Kraft AB	Sveg, Sweden	1	19.0	34.2	115.4	5.30	
1973	Gullspångs Kraft AB	Byarforsen, Sweden	1	9.3	17.0	93.8	5.60	
1973	Stora Kopparbergs Bergslags AB	Kvarnsveden, Sweden	1	12.9	29.2	107.1	5.80	
1973	Östersunds Elektriska AB	Näsaforsen, Sweden	1	15.8	14.0	166.7	3.75	
1973	Österreichische Draukraftwerke AG	Rosegg, Austria	2	23.0	41.0	136.4	5.00	
1973	Centrais Elétrica de Furnas	Pôrto Colômbia, Brazil	4	19.3	85.2	85.7	7.50	

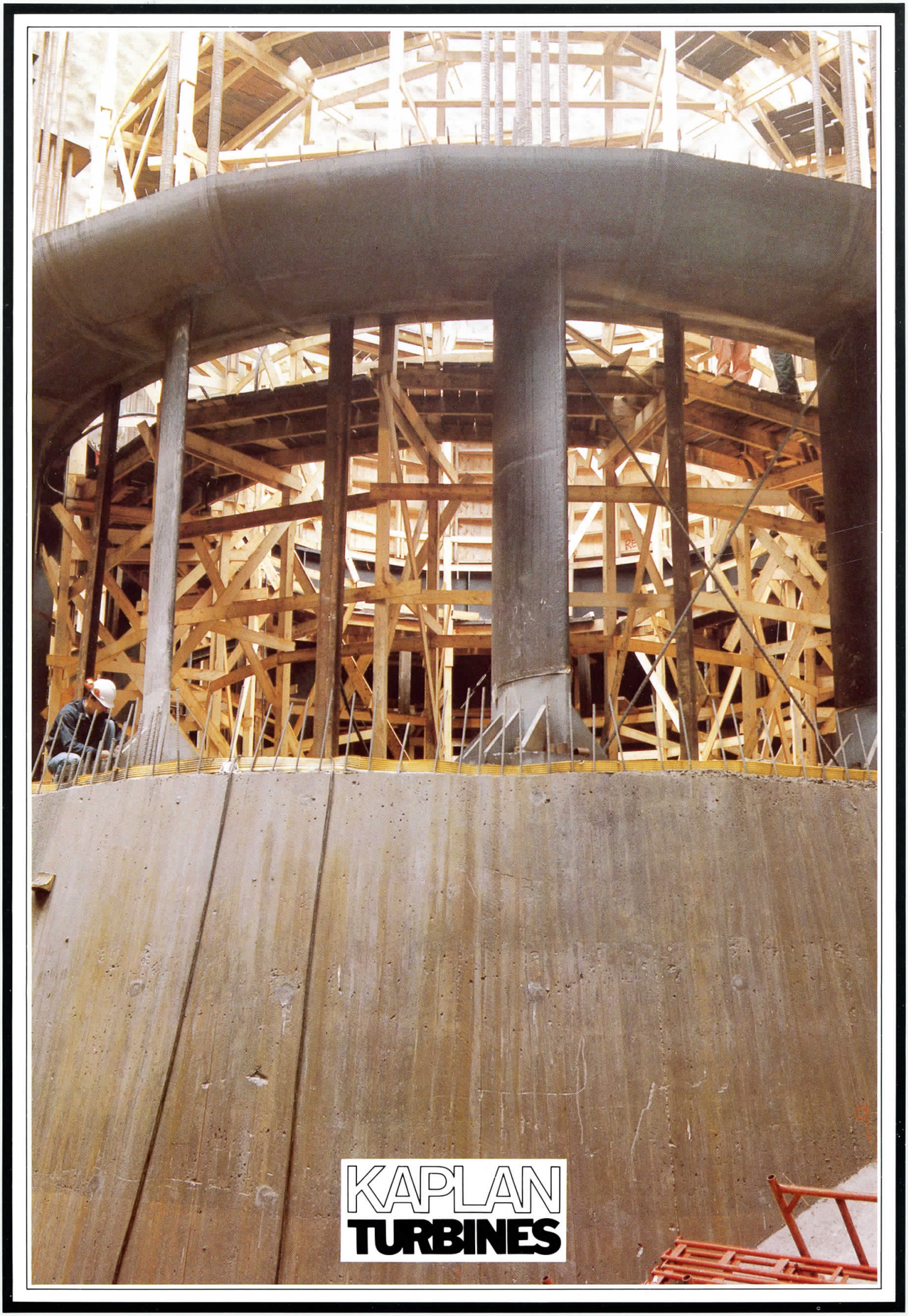
Kpong Chenderoh runners at Markhams of Chesterfield

Year	Customer	Power Station/Country	Number of Units	Head m.	Output per unit MW	Speed r.p.m.	Runner dia. m.	Notes
1974	A/S Hafslund	Sarp, Norway	1	19.6	82.7	93.8	7.30	
1974	Aust-Agder Kraftverk	Rygene, Norway	1	36.2	55.1	166.7	4.56	
1975	Buskerud Kraftverker	Djupdal, Norway	1	14.0	15.0	136.4	4.10	
1975	Sameiet Skogfoss Kraftverk A/S Sydvaranger	Melkefoss, Norway	1	10.0	22.9	93.8	6.00	
1975	Companhia Portuguesa de Electricidade	Valeira, Portugal	3	27.2	83.537	115.4	6.00	
1975	Iberduero S.A.	Villalcampo, Spain	1	38.4	120.2	107.1	6.80	
1976	Bergvik & Ala AB	Halvfari, Sweden	1	23.0	25.1	187.5	3.80	
1976	Iberduero S.A.	Castro, Spain	1	38.4	120.2	107.1	6.80	
1977	Skellefteå Kraftverk	Finnfors, Sweden	1	20.0	22.6	166.7	4.20	
1977	Volta River Authority	Kpong, Ghana	4	11.75	45.7	62.5	8.25	***
1977	Hamar, Van og Furnes Komm. Kraftselskap	Strandfossen, Norway	1	11.3	23.4	100.0	5.60	
1977	Oppland Fylkes E.verk	Faslefoss, Norway	1	34.0	17.8	250.0	2.85	
1978	Sameiet Skogfoss Kraftverk	Melkefoss, Norway	1	10.0	22.86	93.8	6.00	
1979	Swedish State Power Board	Stenkullafors, Sweden	1	22.0	56.8	115.4	6.10	
1980	I/S Skollenborg Kraftverk	Skollenborg, Norway	2	57.2	41.0	272.7	3.28	
1980	Akershus Energiverk	Rånåsfoss, Norway	1	12.3	44.8	75.0	7.40	
1980	Andhra Pradesh State Electricity Board	Nargarjunasagar, India	2	25.0	33.7	150.0	4.40	
1980	Public Electricity and Water Corporation	Roseires Units 5 & 6, Sudan	2	33.0	44.0	136.4	4.80	
1980	Swedish State Power Board	Ligga 3, Sweden	1	39.0	181.7	107.1	7.50	
1981	Arendal Komm. Elektrisitetverk	Evenstad, Norway	1	17.2	12.1	200.0	3.25	
1981	Electricidade de Portugal	Pocinho, Portugal	3	19.5	63.92	88.2	7.00	
1981	Centrais Elétricas do Pará S.A.	Curúa-Una 3, Brazil	1	21.7	10.3	200.0	3.10	

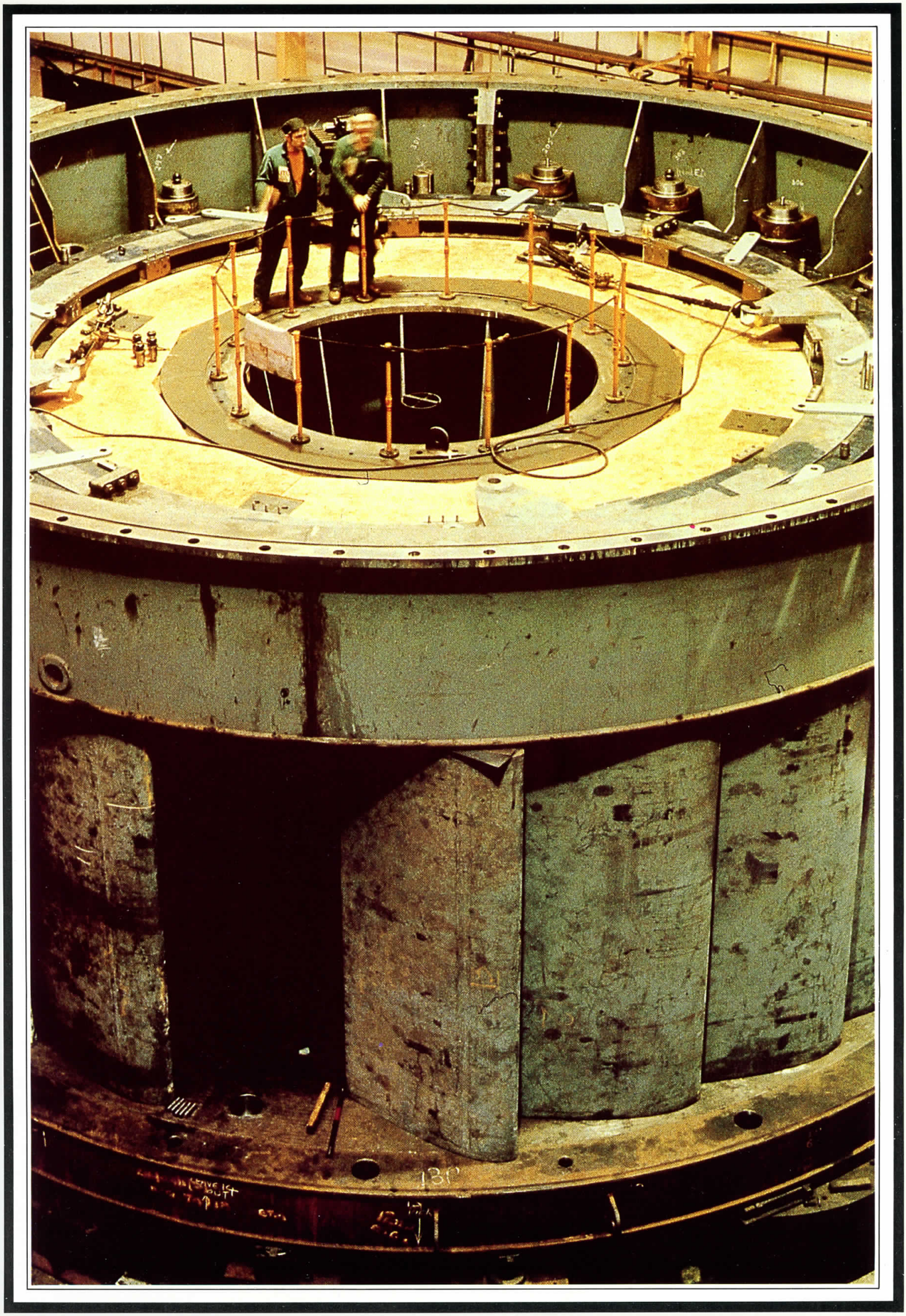


Solbergfoss runner chamber in vertical boring mill

Year	Customer	Power Station/Country	Number of Units	Head m.	Output per unit MW	Speed r.p.m.	Runner dia. m.	Notes
1981	Aust-Agder Kraftverk	Åmli-Gjővv, Norway	1	50.4	18.4	330.0	2.36	
1981	Eidefoss A/S	Eidefossen, Norway	1	15.0	12.5	176.0	3.55	
1982	Oslo Lysverker	Solbergfoss, Norway	1	20.0	104.9	78.9	8.30	
1982	Kristiansands Elverk	Steinsfoss, Norway	1	55.5	62.7	214.3	4.10	
1982	Swedish State Power Board	Stenkullafors, Sweden	1	22.0	57.0	150.0	6.10	
1982	Fellesanleg. Kykkelsrud-Fossumfoss	Kykkelsrud 3, Norway	1	26.0	83.4	115.0	6.40	
1983	Swedish State Power Board	Laxede 3, Sweden	1	24.5	77.7	107.1	6.65	
1983	Gobierno de la Provincia de San Juan	Ullum, Argentina	1	44.0	41.0	176.5	3.90	*
1984	Swedish State Power Board	Porsi, Sweden	1	32.5	105.1	115.4	6.80	
1984	Stora Kopparberg	Ljusne Strőmmar, Sweden	2	16.0	16.6	125.0	4.65	**
1984	Northeast Utilities	Shepaug, U.S.A.	1	29.3	44.3	138.5	4.95	* *** **
1984	Mercer Companies	Glen Park, U.S.A.	2	19.8	14.5	138.0	4.20	**
1985	Virginia Electric and Power Company	Roanoke Rapids, U.S.A.	1	22.6	27.74	128.6	4.29	* **
1986	Public Electricity and Water Corporation	Roseires, Sudan	1	33.0	44.0	136.4	4.80	
1986	Skiensfjordens komm.k.s.	Årlifoss, Norway	1	16.5	23.4	136.0	4.5	
1986	Swedish State Power Board	Sikfors, Sweden	2	19.0	21.6	166.7	3.95	
1986	Perusahaan Umum Listrik Negara (PLN)	Sengguruh, Indonesia	2	22.5	15.1	176.5	3.80	
1987	Andhra Pradesh State Electricity Board	Nargarjunasagar India	1	25.0	33.7	150.0	4.40	
1987	Andhra Pradesh State Electricity Board	Nargarjunasagar Left Bank, India	2	25.0	33.7	150.0	4.40	
1987	Sydkraft AB	Hylte, Sweden	2	59.0	13.65	428.6	1.95	



Solbergfoss stayring under assembly



Kpong Guide Apparatus

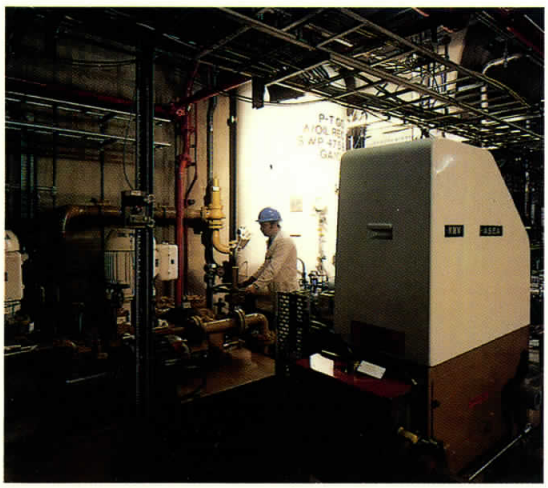
Kvaerner Hydro

The full range of turbines

Apart from Kaplan turbines we also produce a full range of turbines in sizes from 0.3MW to the very largest sizes.

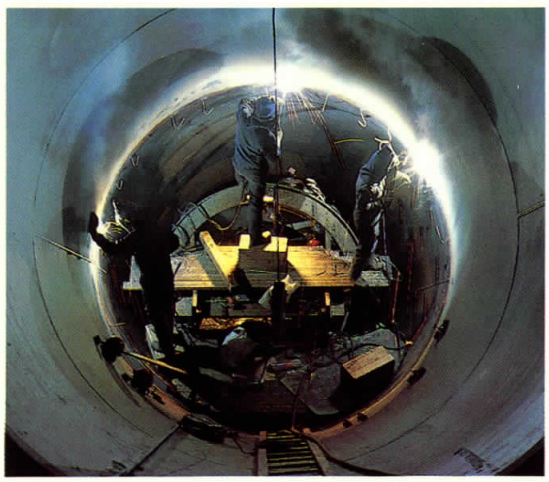
Control Equipment

We produce a range of electro-hydraulic control units together with complementing oil pressure units suitable for all types of turbines.



Gates & Penstocks

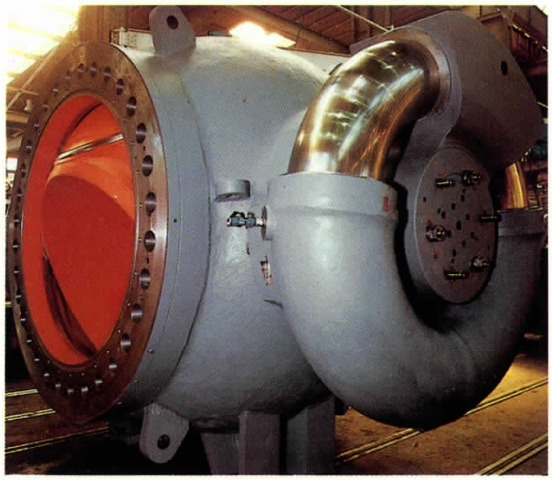
Since the design, delivery and installation of our first gate in 1880, we have supplied most types of gates ranging in size from 200mm to 38.6m span to over 50 countries. We have produced penstocks of a wide variety of diameter with wall thicknesses up to 90m in high tensile steels for static heads up to 1186m.



This page shows only part of our range of products. Our scope of supply also includes: Refurbishment and Upgrading, Repair, Training Schemes and Special Products for Hydro Services, please apply for the appropriate brochures.

Valves

In addition to lattice blade butterfly and spherical valves for turbine isolation and penstock protection, we produce a variety of different types of valves for a wide range of water control duties.



Rack Cleaning Equipment

We produce a variety of rack cleaning equipment covering the range of 2.0m to 4.0m width and with rake clearances up to 1200mm.

Kvaerner Hydro

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