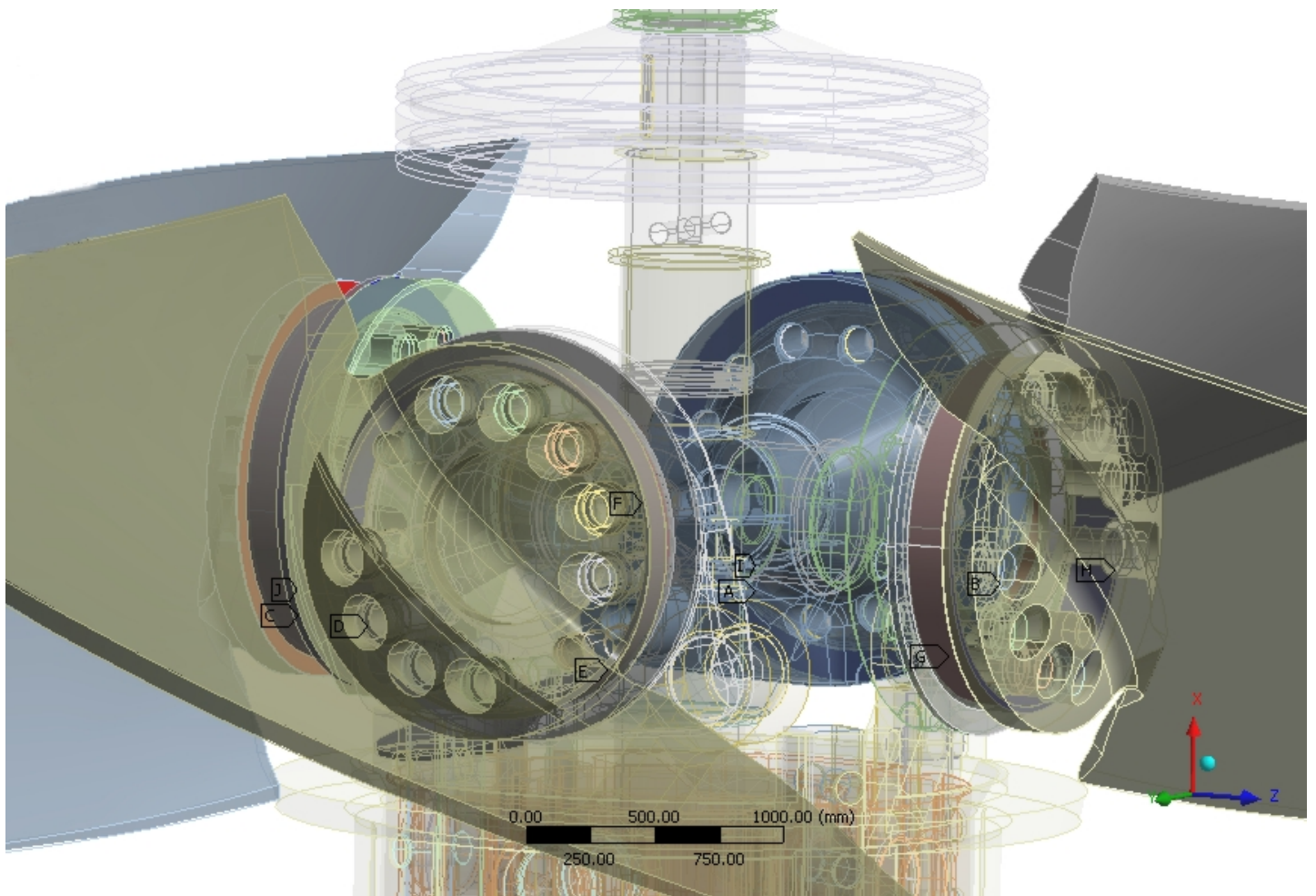


# REFERENCE LISTS



**LITOSTR**  **POWER**

ČKD Blansko Engineering, a.s.

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## The chosen shared references within Litostroj Power Group

Country	Plant	Year	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
India	Bhavani Kattalai Barrage 2, 3	2009	Kaplan Bulb	6,5	6 500	4	15 400
Slovenia	Boštanj	2006	Kaplan Bulb	7,24	4 800	3	10 850
Canada	Magpie	2006	Kaplan "S"	22,7	3 100	3	14 460
Costa Rica	Cariblanco	2006	Francis	422,3	1 120	2	44 746
Canada	Bésy	2006	Francis	80	1 740	1	18 435
Peručica I-IV	Montenegro	2006	Pelton	526	2 400	4	39 400
Kozhner	Kosovo	2006	Pelton	230	1 170	2	4 140
Peručica VI-VII	Montenegro	2005	Pelton	526	2 100	1	59 100
India	Bhavani Kattalai Barrage I	2004	Kaplan Bulb	6,5	6 500	2	15 600
BH	Peč Mlini	2003	Francis	111	1 220	2	15 880
Canada	Misema	2002	Francis	39,9	800	1	3 080
Mieville	Switzerland	2001	Pelton	1448	2 950	1	35 200

## The chosen references of ČKD Blansko Engineering, a.s.

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
India	Gangaram	2014	Hydraulic design of pump, design and manufacturing documentation, manufacturing of model, model tests, delivery of runner, assembly, tests, commissioning  - under realization	Pump	149	2015	3	15000
India	Chokka Rao – Pump Stations  - Gangaram,  - Dharmasagar  - Bhimghanapuram  - Salivagu	2012	Hydraulic design of pumps, design and manufacturing documentation, model manufacturing, model tests, supervision of fabrication, supervision of assembly, tests and commissioning supervision  Deliveries of 8 pcs pump runners and rotation parts  – under realization	Pump	131 138 123 130	1945 1980 1880 1940	2 2 2 2	10880 11350 9850 10550
Czech Republic	Slapy	2011	Modernization and overhaul of unit Nr. 3, hydraulic design, manufacturing of model, model tests, deliveries of new components, assembly, tests, commissioning  – under realization	Kaplan	56	3700	3	55000
Iran	Khoda - Afarin	2011	Hydraulic design, manufacturing of model, model tests	Kaplan	31,7-57	4500	2	51000

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
Poland	Żydowo I, II	2011	Elaboration of technical documentation for modernization of bearings´ cooling and lubricating system of units Nr. 1, 2 and 3.  – under realization	Francis	82,7	2 850	1	52 000
				Francis-pump turbine	82,7	4 500	2	50 000/60 400
Poland	Żarnowiec HZ-2	2011	Elaboration of technical documentation for performance of modernization - mechanical part.  Technical support of Purchaser during realization of the modernization of unit Nr.2  – under realization	Francis-pump turbine	119,3/128	6 000	4	181 500  195 250
Czech Republic	Poděbrady	2010	Modernization and overhaul of unit Nr. 4, deliveries, assembly, tests, commissioning	Francis	2,7	2300	4	260
Czech Republic	Vír 2	2010	Reconstruction of unit Nr. 1, deliveries of new components, tests, commissioning	Kaplan	13,2	1180	1	890
Czech Republic	Znojmo	2010	Reconstruction of unit Nr. 2, hydraulic design, assembly, deliveries of new components, tests, commissioning	Kaplan	14,3	1005	2	790
Poland	Wroclaw I. - HZ-2	2010	Overhaul and modernization of unit Nr. 2, hydraulic design of turbine runner blades and guide vanes, elaboration of technical documentation for performance of the overhaul and modernization, delivery of turbine blades and guide vanes, attendance (technical support) during commissioning.	Kaplan	5,2	3000	2x Kaplan (HZ-1 a 2)	1760
							2x Francis (HZ-3 a 4)	800

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
Poland	Žarnowiec HZ-1	2010	<p>Modernization of unit Nr. 1 – technical support, elaboration of technical documentation for performance of the modernization-mechanical part.</p> <p>Elaboration of tender technical documentation for modernization.</p> <p>Delivery of equipment for adaptation of start-up algorithm.</p>	Francis- pump turbine	119,3/128	6 000	4	181 500 195 250
Czech Republic	Mohelno	2009	Modernization and overhaul of unit Nr. 5, hydraulic design, supply of new components, assembly, tests, commissioning	Kaplan	35	800	1	1000
Czech Republic	Vrané	2009	Overhaul of unit No. 1, hydraulic design, assembly, commissioning	Kaplan	10	3 600	2	8 000
Dem. Rep. Congo (Zaire)	Mwadingusha	2009	Reconstruction of unit Nr. 5, assembly, tests, commissioning	Francis	111	1730	1	12000
Poland	Žarnowiec HZ-3	2009	Analysis of the unit Nr. 3 after modernization, elaboration of operational diagram and analysis of the penstock of unit no. 3 lifetime.	Francis-pump turbine	119,3/128	6 000	4	181 500 195 250

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
Poland	Žarnowiec HZ-3	2009	<p>Modernization of unit no. 3 – delivery new and repair of existing equipment, technical support - engineering, elaboration of technical documentation for performance of the modernization-mechanical part.</p> <p>Elaboration of tender technical documentation for modernization.</p> <p>Delivery of equipment for adaptation of start-up algorithm.</p>	Francis-pump turbine	119,3/128	6 000	4	181 500 195 250
Slovenia	Doblar 1	2009	Hydraulic design, model manufacturing, model tests	Francis	47	2130	3	13700
Vietnam	Yan Tann Sien	2009	Hydraulic design, design and manufacturing documentation	Pelton	685	1350	2	10164
Czech Republic	Kamýk	2008	Modernization and overhaul of unit No. 3, hydraulic design, supply, assembly, commissioning	Kaplan	15,5	3 800	4	12100
Czech Republic	Kroměříž	2008	Modernization and overhaul of SHPP, hydraulic design, design, deliveries, assembly, tests, commissioning	Kaplan	5,2	2120 2200	1 2	930 900
Germany	Markersbach	2008	Rehabilitation and modernization of 6 flap gates including technical documentation and FEM computations, assembly, commissioning	-	-	-	-	-

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
New Zealand	Mangaio	2008	Supply of new SHPP. Project documentation, supply of new Francis turbine including generator, commissioning, design and supply of conical-dispersion valve and butterfly valve	Francis	50	850	1	2 000
Poland	Žur H-1 and H-2	2008	Overhaul and modernization of power plant, hydraulic design, elaboration of technical documentation for performance of the modernization – mechanical part, delivery of new turbine runners, runner chamber, guide bearings, etc.  Supervision of dis-assembly and assembly, commissioning – engineering.	Kaplan	15,7	2410	2	4400
Poland	Žarnowiec HZ-4	2008	Modernization of unit no. 3 – delivery new and repair of existing equipment, technical support - engineering, elaboration of technical documentation for performance of the modernization-mechanical part.  Elaboration of tender technical documentation for modernization.	Francis-pump turbine	119,3/128	6 000	4	181 500 195 250
Czech Republic	Vrané	2007	Modernization and overhaul of unit No. 2, hydraulic design, assembly, commissioning	Kaplan	10	3 600	2	8 000
Poland	Žarnowiec HZ-2	2007	Adaptation of the unit start-up algorithm: - measuring at site - delivery, assembly and commissioning of respective equipment. - adaptation of the algorithm	Francis-pump turbine	119,3/128	6 000	4	181 500 195 250

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
Czech Republic	Střekov	2006	Overhaul of unit No. 1, supply, assembly and commissioning	Kaplan	10	4 300	3	6 000
Dem. Rep. Congo (Zaire)	Lubilanji II-UNO	2006	Hydraulic design, layout drawings, supply, assembly, commissioning	Kaplan - PIT	13,8	1 500	3	1 750
Dem. Rep. Congo (Zaire)	Inga	2006	Supply inlet and draft tube stop-logs, assembly	-	-	-	-	-
Czech Republic	Les Království	2005	Complete reconstruction of SHPP, hydraulic design and supply of new Francis turbines include generators, assembly, commissioning	Francis	22	1 040	2	1180
Czech Republic	Dalešice	2005	Delivery of new disc for butterfly flap valve - unit No. 4 - DN 5400 PN16 - design documentation, assembly, commissioning	-	-	-	-	-
Czech Republic	Nemilka	2005	Delivery of Reiffenstein turbine	Reiffenstein	16	370	1	110
Germany	Hohenwarte I	2005	Measurement and calculations of the turbine runner aiming to reduction of cavitation.	Francis-revers	67,9	4610	2	26 500
Czech Republic	Bystřička	2004	Supply and assembly of slide bulkhead-gate, butterfly flap valve and conical-dispersion valve	-	-	-	-	-
Czech Republic	Dalešice TG4	2004	Modernization and overhaul of unit nr. 4 - hydraulic design of runner, model tests, , assembly, overhaul of rapid-closing flap valve, commissioning	Pump-Turbine	89/93	6 000	4	121 500
Czech Republic	Hracholusky	2004	Repairs and reconstruction of two conical-dispersion valve DN 1400	-	-	-	-	-

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
Czech Republic	Orlík	2004	Repairs of unit Nr. 1, 2, and 4 after damaging by floods	Kaplan	70,5	4 600	4	95 900
Czech Republic	Poděbrady	2004	Completion of repairs of unit Nr. 3 and commissioning	Francis	4	290	5	1040
Czech Republic	Štěchovice III	2004	Completion of repairs of emergency valve servomotor and commissioning	Pump-Turbine	220/225	2 200	1	50 000
Czech Republic	Vydra	2004	Hydraulic design of new runner, supply, assembly, commissioning	Francis	235	1 000	2	4 200
Germany	Goldisthal	2004	Delivery of turbine components, assembly	Pump-Turbine	334 279,2	4 610	4	269 000
India	Kadana	2004	Commissioning of 3 pcs Diagonal Deriaz Turbine	Diagonal Deriaz	48,2/51	5 000	4	61 700
India	Tillari	2004	Upgrading, runner hydraulic design, supervision assembly and commissioning	Pelton	625,4	2 020	1	68 200
USA	Parker Dam	2004	Model tests	Francis	25	4 740	-	40 000
Australia	Burrendong	2003	Supply of 2 new runners of the Francis turbine	Francis	36,9	1 660	2	5 640
Czech Republic	Dlouhé Stráně	2003	Adjustments of runner of unit Nr. 1, repairs guide vanes	Pump-Turbine	547/554	4 540	2	325 000 301 000

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
Czech Republic	Kružberk	2003	Overhaul of HPP, project design of rehabilitation, supply, assembly and commissioning	Francis	71	1 000	1	4 380
Czech Republic	Slapy	2003	Supply, testing and handing over of temporary stop-logs of bottom outlets	Kaplan	56	3 700	3	50 000
Czech Republic	Štěchovice I	2003	Rehabilitation of Unit 1, assembly and commissioning	Kaplan	20	3 600	2	13 500
Czech Republic	Štěchovice III	2003	Rehabilitation of Unit 3, assembly and commissioning	Pump-Turbine	220 225	2 200	1	50 000
Czech Republic	Vranov	2003	Upgrading, runner hydraulic design overhaul of unit Nr. 3, assembly, commissioning	Francis	42	2 000	3	6 300
Dem. Rep. Congo (Zaire)	Lubilanji-II BIS	2003	Hydraulic design, layout drawings, supply, assembly, commissioning	Kaplan - PIT	13,8	1 500	3	1 750
Germany	Markersbach	2003	Calculations and measurements of cavitation on model	Pump-Turbine	307 315	3 980	6	175 000 182 000
Pakistan	Mangla	2003	Reconstruction of Francis turbine governing mechanism - units Nr. 5 and Nr. 6	Francis	125	4 000	2	103 000
Slovak Republic	Domáša Ružín	2003	Repairs of quick-closing gates of unit TG1	-	-	-	-	-
Sri Lanka	Uda Walawe	2003	Repairs of Kaplan turbine wicket gates	Kaplan	13	1 800	3	2 000

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
USA	Northfield Mountain	2003	Model tests	Pump-Turbine	251 255	5 200	-	320 000 255 000
Czech Republic	Pastviny	2002	Hydraulic design of new runner, supply, assembly, commissioning	Francis	30	1 340	1	3 250
Czech Republic	Práčov	2002	Overhaul of HPP, hydraulic design, model tests, supply of new turbine and governor, assembly, commissioning	Francis	85	1 300	1	10 200
Czech Republic	Vranov	2002	Upgrading, runner hydraulic design overhaul of unit Nr. 2, assembly, commissioning	Francis	42	2 000	3	6 300
Pakistan	Khari	2002	Project design, assembly, commissioning	Francis	65	1 000	1	1 520
USA	Round Butte	2002	Model tests	Francis	110	3 500	1	127 000
Bulgaria	Bujanovska	2001	Project, assembly, commissioning	Francis-horiz.	27,9	410	1	245
Czech Republic	Dalešice TG1	2001	Overhaul of unit Nr. 1, hydraulic design of guide vanes, assembly, commissioning	Pump-Turbine	89/93	6 000	4	112 500
Czech Republic	Vír	2001	Overhaul of unit Nr. 2, supply of new runner, upgrading of parameters, assembly, commissioning	Francis	64	1 150	2	6 440
Czech Republic	Vranov	2001	Overhaul and modernization of unit Nr. 1, supply, assembly, commissioning	Francis	42	2 000	3	6 300
Georgia	Khrami	2001	Hydraulic design, model tests	Francis	324	2 500	2	55 300
Greece	Messochora	2001	Design, hydraulic design, model tests, supervision assembly, dry tests	Francis	225	2 800	2	82 650

Country	Plant	Year	Description of activities	Type of turbine	H (m)	D (mm)	Number of units	Unit output (kW)
New Zealand	Botocan	2001	Supply of 2 butterfly valves DN 1200 PN 22	-	-	-	-	-
USA	Fairfield	2001	Model tests	Pump-Turbine	-	-	8	85 000 79 000
USA	Grand Coulee	2001	Model tests	Pump	110	4 200	1	45 000
Czech Republic	Morávka	2000	Design of cone valves, overhaul of Francis turbine, assembly, putting into operation, commissioning	Francis	38	250	1	52
Columbia	Dolores	1999	Hydraulic design, project design, assembly supervision, commissioning	Francis - horiz.	95	1 130	1	8 186
Columbia	Pajarito	1999	Hydraulic design, project design, supervision assembly, commissioning	Francis	120	1 030	1	5 150
Czech Republic	Dalešice TG3	1999	Overhaul of unit Nr. 3, hydraulic design of guide vanes, overhaul of butterfly valve, assembly, commissioning	Pump - Turbine	89/93	6 000	4	112 500
Germany	Eichicht	1999	Modernization of unit D and E, project design of rehabilitation, design of new runner, assembly supervision, guarantee measurements, commissioning	Kaplan	13,3	1 550	2	1 760
Japan	Ebara	1999	Hydraulic design, licence	Kaplan - horiz.	-	-	-	-
Italy	Treja	1998	Project design, assembly, commissioning	Kaplan	8,4	1 000	2	450
Peru	Curumuy	1998	Hydraulic design, project design, supervision of assembly, guarantee measurements, commissioning	Kaplan	39	1 650	2	6 354

