HYDROTECHPROJECT

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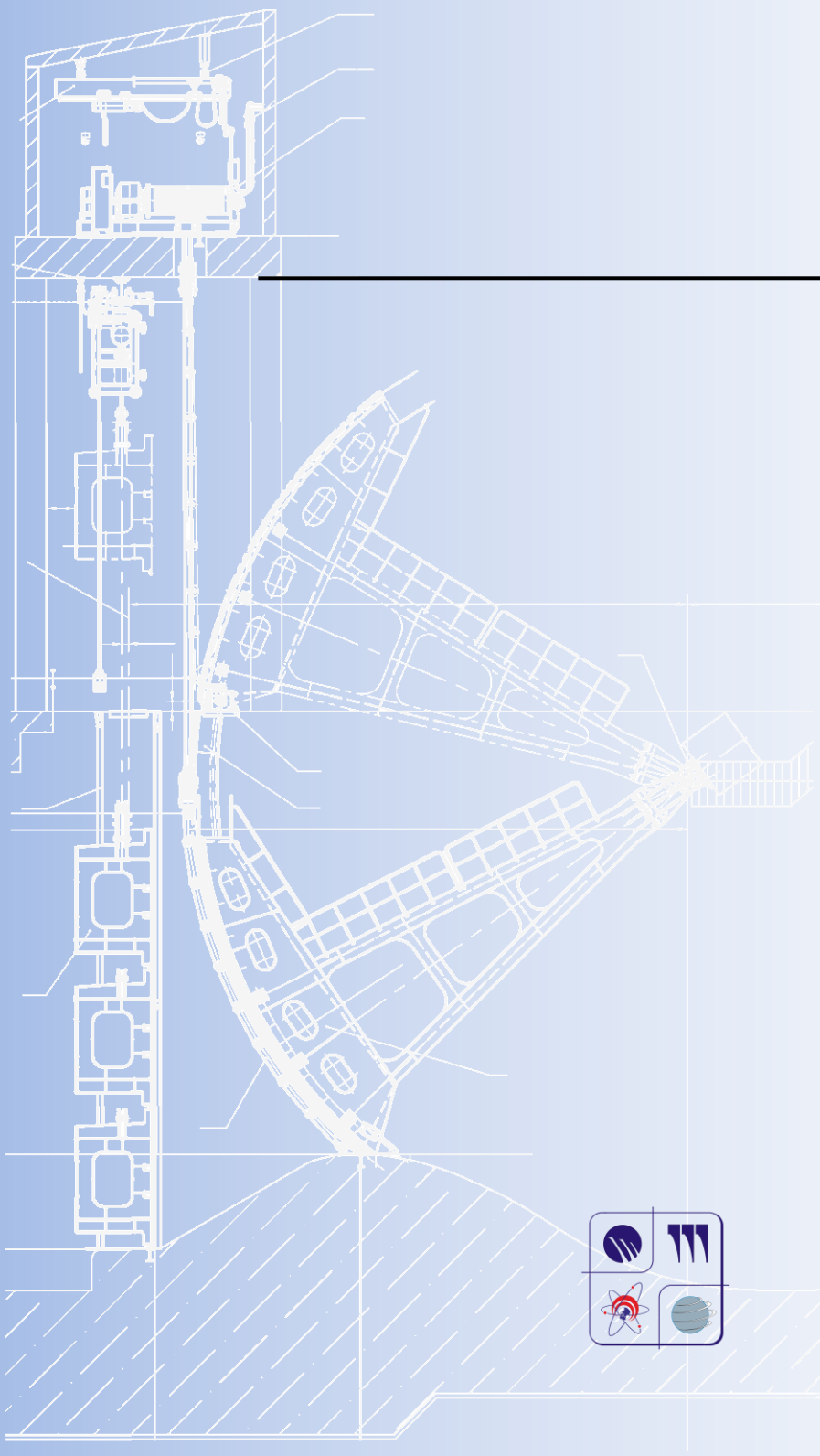
Reference



UKRAINE – KHARKIV

2015

CONTENTS

BRIEF SUMMARY

HYDROTECHPROJECT LTD., along with UKRHYDROPROJECT PJSC, INTERDEPARTMENTAL CENTRE OF ENGINEERING RESEARCHES LTD. and UKRATOMENERGOPROJECT LTD. is a part of the Design Engineering Complex “Grant” and specializes in the design and engineering services in the field of hydropower and hydroeconomic construction as well as in the development of renewable energy sources inside and outside of Ukraine.

The company started its activity as a design engineering organization in 2007. The main staff of the company was the employees who had passed the school of UKRHYDROPROJECT Institute. We are proud to save the best traditions of UKRHYDROPROJECT Institute, particularly the top quality of developed design products, maintenance of high world standards of the hydropower facilities under design.

In addition to the design of hydropower facilities, we are actively engaged in design of power grid facilities (transmission lines and substations), mining facilities, thermal and nuclear power plants, residential and civil buildings and structures, as well as in landscape design.

In January 2011 the company was certified according to the European system of quality ISO 9001:2008, and in August 2012 - according to the Ukrainian system of quality DSTU ISO 9001:2009, which were successfully implemented in our production process.

1. ENGINEERING AND TECHNICAL SUPPORT

1.1. Corporate strategy

Strategy of HYDROTECHPROJECT LTD. is to work in the modern information environment and to use widely innovative technologies during the design of complex power projects. This implies, in particular, the integration of multiple complex computer-aided design systems (CAD), which is considered to be one of the most important conditions for the effective management of the whole life cycle of the project.

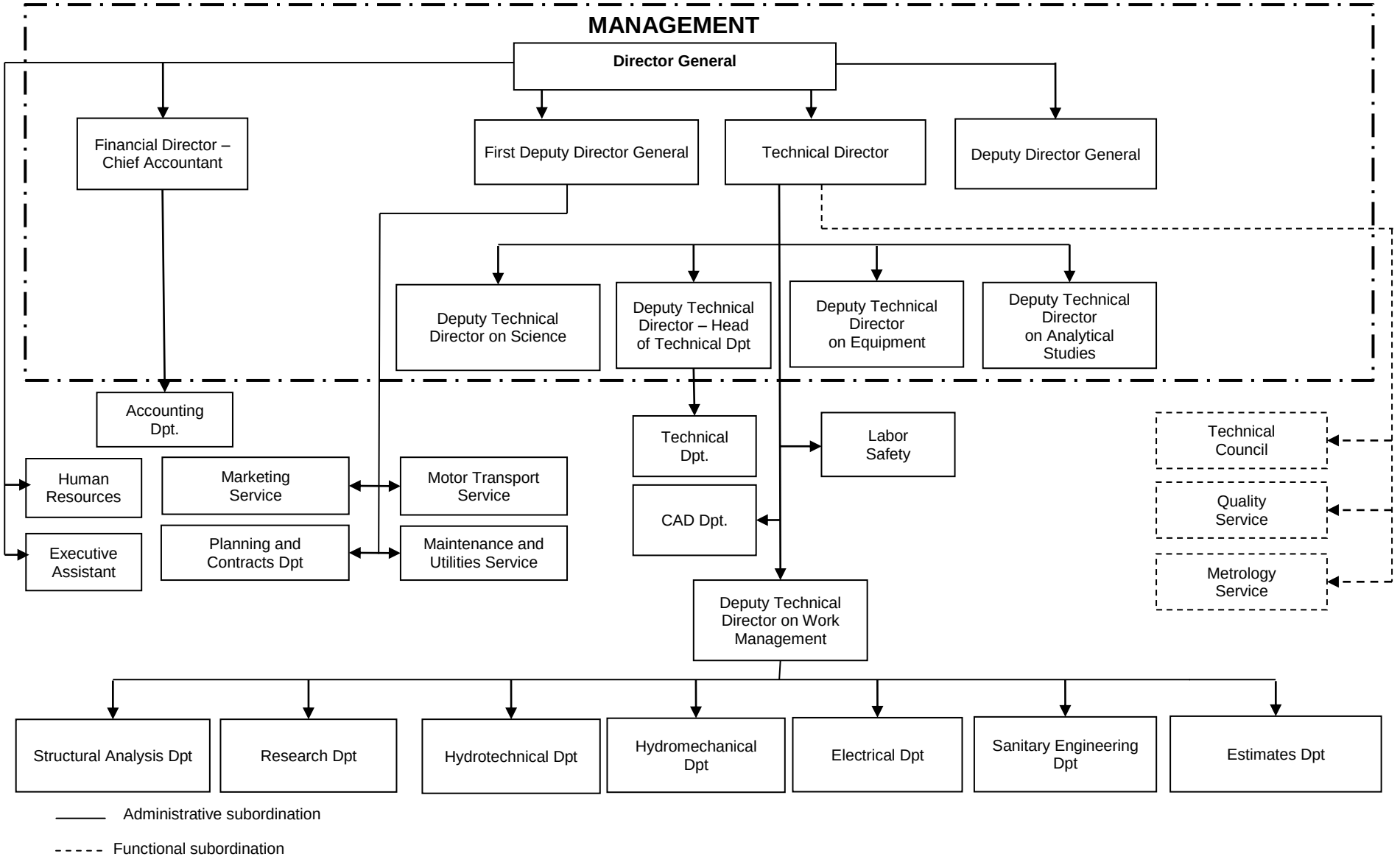
At the first phase of this strategy, the company has developed and successfully applies the design technology based on software products of Autodesk company: AutoCAD and special supplements in different sections of design. For separate buildings (structures) 3D-model is created, on the basis of which all main structures are worked out, which determines the exact geometry of all structural elements, on the basis of which the issues of the location of main technological equipment, technological communications are resolved.

At the second phase, currently under way, the company started the process of knowledge and skills integration of its staff to work in various CAD: AutoCAD, PDMS (developer of AVEVA), SmartPlant (developer of Intergraph) and others. In prospect, the possibility of parallel work of the company's staff with IT products of high level on various technological platforms is foreseen, depending on customer's requirements. This will enable the company to take part in the most ambitious infrastructure projects, both independently and in cooperation with other leading engineering companies in Ukraine, Russia and other near and far abroad countries.

1.2. Staff and structure of the company

The staff of HYDROTECHPROJECT LTD. consists of more than 200 qualified specialists with higher engineering education. The company's structure includes the technical department, which is an intellectual centre of the whole process of production, the hydrotechnical department, technological department, research department, structural analysis department, department of complex design of nuclear and thermal power plants, sanitary engineering department and CAD department. Such a structure ensures the complete design cycle of hydropower facilities. The high degree of integration and cooperation with other organizations of Design and engineering complex "GRANT" allows us to effectively use the capabilities of the partners in engineering studies, research and development of hydraulic and filtration models of structures, design and theoretical studies of especially complex structures. The company is constantly expanding its range of design and engineering services.

ORGANIZATIONAL CHART of HYDROTECHPROJECT LTD.



2. MAIN TYPES OF WORK

HYDROTECHPROJECT LTD. carries out a complex of design works, related to the construction and rehabilitation of hydropower plants, pumped storage plants, thermal and nuclear power plants, canals, hydraulic structures at ore and mining complexes, transmission lines and substations, civil and residential buildings and structures, landscape design. Software acquired by the company allows to carry out all necessary engineering calculations.

The company carries out the following types of work:

- **Design works**:

- Architectural and construction design, including:

residential buildings, buildings and structures of industrial enterprises, engineering structures, transportation networks, structures and complexes, hydraulic structures and complexes, power facilities and complexes,

- Design of internal engineering systems and networks, including:

water supply and sewerage, ventilation and air conditioning, electric power supply, electrical equipment and electrical lighting, communications, alarm, radio, television, information networks.

- **Engineering works**

- **Functions of general developer during the design of industrial buildings and structures**

- **Technical inspection and assessment of the state of buildings, structures and engineering networks**

- **Functions of general contractor during the construction of industrial buildings and structures**

- **Technical supervision over the construction**

- **Designs of the organization of construction works**

3. EXPERIENCE IN THE DEVELOPMENT OF DESIGN DOCUMENTATION

Accepted abbreviation: ES – Engineering supervision, VI – visual inspection, SD – schematic design, DD – detailed design, SDD – schematic and detailed design, FS – feasibility study.

3.1 Hydropower facilities: HPPs

Facility	Name of works	Country	River	Capacity, MW	No. of units	Stage and Year of realization
HPPs of Ukrhydroenergo PJSC	Rehabilitation. 2nd stage. Heating, air conditioning, ventilation, water supply, sewerage, and fire extinguishing systems	Ukraine	Dnieper, Dniester	4849	99	DD 2011
HPPs of Ukrhydroenergo PJSC	Rehabilitation. 2nd stage. Renewal of back walls.	Ukraine	Dnieper, Dniester	4849	99	DD 2012
HPPs of Ukrhydroenergo PJSC	Automated control system of hydraulic structures. Analysis of the compliance of the detailed design with the main provisions of design safety system	Ukraine	Dnieper, Dniester	4849	99	2012
HPPs of Ukrhydroenergo PJSC	Cascade of HPPs and PSPs on Dnieper and Dniester. Assessment of hydrotechnical structures. Calculations and updating of maximum permissible value of the instrumentation.	Ukraine	Dnieper, Dniester	4849	99	2013
HPPs of Ukrhydroenergo PJSC	Rehabilitation. 2nd stage. Update of the design to increase reliability and safety of hydrotechnical structures, main hydropower and hydromechanical equipment	Ukraine	Dnieper, Dniester	4849	99	DD 2012-2013
HPPs of Ukrhydroenergo PJSC	Rehabilitation. 2nd stage. Detailed design and development of technical specifications for bidding process	Ukraine	Dnieper, Dniester	4849	99	DD 2012-2014
HPPs of Ukrhydroenergo PJSC	Rehabilitation. 2nd stage. Engineering supervision in 2012-2014	Ukraine	Dnieper, Dniester	4849	99	ES 2012-2014

Facility	Name of works	Country	River	Capacity, MW	No. of units	Stage and Year of realization
Dnieper HPP	Automated control system of hydraulic structures. Addition to the layout diagram of point tensometers of spillway dam	Ukraine	Dnieper	1462	17	2012
Kakhovka HPP-2	Spillway dam stability cauculations for the period of construction of Kakhovka HPP-2	Ukraine	Dnieper	250	6	2013
Kakhovka HPP-2	Development of several parts of the feasibility study over Kakhovka HPP-2 construction	Ukraine	Dnieper	250	6	FS 2014-2015
HPPs of Ukrhydroenergo PJSC	Rehabilitation. 2nd stage	Ukraine	Dnieper, Dniester	4849	99	DD 2015-2017
Kremenchuk HPP	Analysis of the design documentation over hydrounits Nos. 8 and 9 rehabilitation	Ukraine	Dnieper	625	12	DD 2015
Dnieper HPP-2	Analysis of the design documentation over hydrounit No. 17 rehabilitation	Ukraine	Dnieper	876,8	8	DD 2015
Dniester HPP-1	Rehabilitation of the earth-and-rock-fill dams core	Ukraine	Dniester	702	6	DD 2015-2017
HPPs of Ukrhydroenergo PJSC (Kremenchuk HPP)	Complex inspections of the current state of hydrotechnical structures of HPPs and PSPs operated by Ukrhydroenergo PJSC to rise the reliability and safety of their operation at design conditions taking into account contemporary requirements on reliability and safety of hydro schemes operation	Ukraine	Dnieper	625	12	DD 2015-2017
Kakhovka HPP-2	Development of the design works over the temporary removal with further retracement of linear power structures within feasibility study over Kakhovka HPP-2 construction	Ukraine	Dnieper	250	6	FS 2015-2016
Volga HPP	Rehabilitation of the transfer units with the replacement of oil-filled for the dry ones	Russia	Volga	2592.5	22	SDD 2010
Verkhne-Krasnogorsk HPP	The 1st stage of the construction of the headworks (water intake, spillway, earth dams).	Russia	Kuban	89.6	4	DD 2010

Facility	Name of works	Country	River	Capacity, MW	No. of units	Stage and Year of realization
Nyzhne-Bureya HPP	HPP layout options	Russia	Bureya	320	4	DD 2011
Iova HPP-10	HPP rehabilitation	Russia	Iova	96	2	DD 2011-2014
Baksan HPP	Development and updating of electrical part of detailed design within the Customer's group of detailed design at the site and supervision over the performance of works on electrical part by civil, installation, and commissioning contractors at the site	Russia	Baksan	25	3	ES 2012
Ust-Khantayka HPP	Technical requirements for the design of Ust-Khantayka HPP rehabilitation	Russia	Khantayka	511	7	DD 2012
Ust-Khantayka HPP	Replacement of hydro units equipment	Russia	Khantayka	511	7	DD 2012-2021
Polotsk HPP	Development of the design documentation, engineering supervision	Belarus	Zapadnaya Dvina	22	5	DD, ES 2011-2015
Grodno HPP	Detailed design, engineering supervision	Belarus	Neman	17	5	DD, ES 2012
Mtkvari HPP	Design works on the justification of structures (pressure tunnel, operational spillway), instrumentation	Georgia	Mtkvari	46.4	2	DD 2011-2012
Mtkvari HPP	Detailed design and engineering supervision over the completion of Mtkvari HPP construction. Erection bay and auxiliary equipment	Georgia	Mtkvari	53	2	DD, ES 2014-2016
Grand Ethiopian Renaissance Dam Project	Development of design engineering documentation on Grand Ethiopian Renaissance Dam Project. Analytical, hydraulic and filtration justifications of design solutions for stages 1.1 and 2.1	Ethiopia	Blue Nile	6000	16	DD 2011-2013

3.2 Hydropower facilities: small HPPs

Facility	Name of works	Country	River	Capacity, MW	No. of units	Stage and Year of realization
Belotserkovka HPP	Prefeasibility studies	Ukraine	Ros	1.54	2	2011
Mikhailovka HPP	Rehabilitation with the replacement of equipment of hydroschemes	Ukraine	Psel	0.186	2	DD 2012-2014
Parande HPP	Refinement of the design solutions	Afghanistan	Parande	4	2	SDD 2013

3.3 Hydropower facilities: Pumped Storage Plants (PSP)

Facility	Name of works	Country	River	Capacity, MW		No. of units	Stage and Year of realization
				Turb.	Pump.		
Tashlyk PSP, unit 3	Completion of construction and measures to improve the safety and reliability of structures and systems of the Cascade of HPPs-PSPs. Primary works: analysis of the hydrological mode of the river in connection with the operation of HPPs-PSPs	Ukraine	Uzhniy Bug	906	1382	6	DD 2011
Zelenchuk HPP-PSP	Verification of calculations and specification of the facilities` designs	Russia	Bolshoi Zelenchuk	140	160	2	2011
Dniester PSP	Design and survey, research works on the justification of detailed design and provision of engineering supervision: heating, air-conditioning, ventilation, water supply, sewerage and firefighting systems; instrumentation; hydrological and filtration calculations	Ukraine	Dniester	2268	2949	7	DD 2011-2014
Tashlyk PSP, unit 3	Completion of construction. Ventilation, heating and firefighting systems, installation and certification of instrumentation, filtration and hydraulic calculations, environment impact assessment	Ukraine	Uzhniy Bug	906	1382	6	DD 2011-2013
Tashlyk PSP, unit 3	Works on the control and supervision over the construction. Commissioning of the hydro unit	Ukraine	Uzhniy Bug	906	1382	6	DD 2011-2015
Kaniv PSP	Specification of technical decisions and technical support for preparation of the design materials for Kaniv PSP	Ukraine	Dnieper	1000	1040	4	SD 2012-2013
Tashlyk PSP, Oleksandrivka HPP	Automated system of early detection of emergencies. Subsystem “Automated control system of hydraulic structures”	Ukraine	Uzhniy Bug	906 / 11.5	1382	6 / 2	DD 2012-2013
Dniester PSP	Design Update for the 1st stage of the PSP including measures on reliability and safety of hydrotechnical structures, main hydropower and hydromechanical equipment. Lower reservoir	Ukraine	Dniester	2268	2949	7	DD 2015
HPPs-PSP of Ukrhydroenergo PJSC (Kyiv PSP)	Complex inspections of the current state of hydrotechnical structures of HPPs and PSPs operated by Ukrhydroenergo PJSC to rise the reliability and safety of their operation at design conditions taking into account contemporary requirements on reliability and safety of hydro schemes operation	Ukraine	Dnieper	235, 5	139	6	DD 2015
Kaniv PSP	Technical solutions on the priority facilities commissioning	Ukraine	Dnieper	1000	1040	4	DD 2015-2016

3.4 Other hydrotechnical facilities

Facility	Name of works	Country	Stage and Year of realization
Severskiy Donets – Donbas Canal, units 1, 4, 5	Rehabilitation of the pumping plants	Ukraine	DD 2011-2012
Pechenegy hydro scheme	Operating rules of the Pechenegy reservoir on the Severskiy Donets River; Technical inspection and evaluation of the state of construction structures, buildings and engineering networks	Ukraine	2012-2013
Moscow Canal	Development and implementation of the complex design for the rehabilitation of infrastructure facilities	Russia	SD 2010
Krasnogorskiy water-lifting hydroscheme on the Irtysh River	Shipping lock	Russia	DD 2010

3.5 Other power facilities

Facility	Name of works	Country	Stage and Year of realization
Thermal power facilities			
Combined heat power plant State Enterprise PA Makarov Yuzhniy Machine-Building Plant	Technical re-equipment	Ukraine	FS 2012
Komsomolsk TPP	Hydraulic and hydrogeological calculations for the site of TPP	Ukraine	FS 2012-2013
Slovyansk TPP	Rehabilitation of the Unit 6 with dividing it into Units 6a and 6b (330 MW each)	Ukraine	SD 2014-2016
TPP-8 of Mosenergo OJSC	Rehabilitation of the UPS in circuits of technological protections, installation of backup power EC-14, TG-10	Russia	DD 2016
Nuclear power facilities			
NPPs in Ukraine	Analysis of the perspective sources of service water supply, technical and economic characteristics of the hydraulic structures, sites for the construction of power generating units of new nuclear power plants.	Ukraine	2011
Rivne NPP	Unit 3. Detailed design for the industrial TV system	Ukraine	DD 2013
Novovoronezh NPP	Replacement of disconnectors for 220 kV Switchyard of the 1st section.	Russia	DD 2011
Smolensk NPP	Modernization of informational and diagnostic systems for the safety monitoring of hydraulic structures	Russia	DD 2013
Nin Thuận 1 NPP	Hydraulic calculations for the justification of technical solutions on the complex of water intake and spillway structures of the NPP`s service water supply system	Vietnam	FS 2012-2013

3.6 Other facilities

Facility	Name of works	Country	Stage and Year of realization
Northern Ore and Mining Complex	Rehabilitation of tail facilities and water reuse to maintain plant's production. 1st commissioning stage. Separating dam and spillway. 2nd stage. Spillway of the 3rd Stage.	Ukraine	DD 2010
ArcelorMittal Kriviy Rih	Civil works of spillway well No. 4 at the tail storage "Chetverta Karta" which is under rehabilitation.	Ukraine	DD 2010
Galitske highway in Ivano-Frankivsk City	Collection of initial hydrometric and hydro-meteorological data with further wind-wave and hydrological calculations for the bridge crossing over the river Bystritsa Solotvinska	Ukraine	SD 2011
Hermes-SV, Ltd.	Rehabilitation of the existing building of the shop on buckwheat production	Ukraine	SDD 2011
ArcelorMittal Kriviy Rih	Rehabilitation of a stone crashing- and sorting plant used for crushed stone production for leveling of railways in quarries No. 3 and No. 2-bis, dumps and construction of inner quarries' roads	Ukraine	SDD 2012
Resort hotel structures at Skhydnytsa urban-type village in Lvov region	Calculations of slope stability of hotel structures in Skhidnytsya urban-type village in Lvov region taking into account seismicity of 6 points, saturation of foundation soil with water and sequence of structures erection.	Ukraine	DD 2012
South Ukraine Nuclear Power Plant	The main building of a motor transport facility for 350 automobiles. Water supply, sewerage and fire extinguishing systems within the main building	Ukraine	DD 2015-2016

4. ENGINEERING AND CONSULTING SERVICES

Facility	Name of works	Country	Stage and Year of realization
Mikhailivska and Malo-Vorozhbyanska HPPs	Visual inspection	Ukraine	SDD 2010
Krasnostavska and Kochubeevska HPPs	Visual inspection, technical and economic parameters of small HPPS on the Zhvanchik River	Ukraine	2011
Tashlyk PSP	Field control inspections over the state of hydraulic structures of the facilities of construction completion	Ukraine	DD 2011, 2015
Dniester PSP	Field control inspections, special survey and monitoring of structures of construction completion of the 1st stage consisting of three units	Ukraine	DD 2011-2014
Tereblya-Rika HPP	Inspection of hydraulic structures and hydromechanical equipment	Ukraine	2012
Small HPP on the Striy River	Visual inspection of the area near Rybnik village, where the construction of small HPP is planned	Ukraine	2012
Dniester HPP	Analysis of the state of hydraulic structures following the data of the field monitoring in the period of 2009 - 2010	Ukraine	2012
Ladyzhin HPP	Consulting services for participation in bidding procedures on the rehabilitation of Ladyzhin HPP	Ukraine	2012
Dniester HPP-2	Inspection of the bridge crossing	Ukraine	2013
Dubovska and Ostrivetska small HPPs	Visual inspection of Dubovska and Ostrivetska small HPPs on the Yatran River	Ukraine	2013
Small HPP in Zhytomyr	Visual inspection and feasibility of the rehabilitation of small HPP in Zhytomyr and the construction of small HPPs at the hydro schemes in operation in the village Stanyshovka and the Malyn town in Zhytomyr region. Selection of priority small HPP	Ukraine	2012-2013
Pechenegy hydro scheme	Technical inspection and evaluation of the state of construction structures, buildings and engineering networks	Ukraine	2012-2013
HPPs of Ukrhydroenergo PJSC	Inspection of hydraulic structures and hydromechanical equipment	Ukraine	2014
Oleksiivska Small HPP on the Uzhniy Bug River	Visual inspection of nonworking Oleksiivska Small HPP on the Uzhniy Bug River in Nemirov district	Ukraine	2015

Facility	Name of works	Country	Stage and Year of realization
	of Vinnitsa region and defining the preliminary water-power characteristics of the Small HPP and providing recommendations for its rehabilitation		
Dubossary HPP	Field control inspections over the state of hydraulic structures	Moldova	DD 2011-2013, 2015
Shardara HPP	Technical and technological parts of bid technical commercial offer on the modernization of Shardara HPP (1 stage)	Kazakhstan	2012-2013
Upper Naryn Cascade	Actalization of the hydro scheme sites selection of Upper Naryn Cascade	Kyrgyzstan	2013
Tupolang HPP	Technical requirements on the supply of equipment for the HPP at Tupolang reservoir	Uzbekistan	2012
Power projects in Lebanon	Consulting services concerning negotiations between JSC “Technopromexport” and Ministry of Energy and Water Resources of Lebanon	Lebanon	2014
Alpaslan II HPP	Technical part of the bid offer on the design, procurement of materials, assembly and factory testing, completion and painting, packing for sea and/or land transportation to the construction site, unloading and storing at the construction site, installation, supervision, pre-commissioning and commissioning of equipment for HPP Alpaslan II	Turkey	2012-2013
Parande HPP	Consulting services for the completed constructional part of water intake and the power house; Assessment of the installed turbines, generators and gates of Parande HPP	Afghanistan	2013
HPPs Pul-i-Humri I and II	Technical part of the bid offer on the rehabilitation and restoration of the HPPs Pul-i-Humri I and II and canal between them	Afghanistan	2013
Lawi HPP	Bid offer	Pakistan	2014-2015
Dokan HPP	Visual inspection of the HPP Dokan at the Iraqi Kurdistan	Iraq	2013
Xekaman-3 HPP	Assessment of the quality of hydrotechnical structures	Laos, Vietnam	DD 2013

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