



**Reference list of installation and commissioning works
for period 2008-2021**

Project name	Construction of new 220 kV substation for Yerevan CCPP-2
Customer	“Artashat ENC” LLC (Armenia)
Year	2019-2021
Scope of work	<ul style="list-style-type: none"> ○ Installation of 220 kV power and commutation equipment ○ Installation of the steel structures ○ Supply and installation of control and power cables ○ Supply and installation of Marshaling kiosks ○ Supply and installation of post insulators ○ Supply and installation of earthing system ○ Installation of lightning protection system ○ Supply and installation of external lighting system ○ Supply and installation of AC/DC panels ○ Installation of die-cast connectors ○ Full set of commissioning works

Project name	Rehabilitation of 220 kV substation at Spandaryan HPP
Customer	EFACEC Engenharia e Sistemas, S.A. (Portugal)
Year	2018 – 2021
Scope of work	<ul style="list-style-type: none"> ○ Dismantling of power and commutation equipment of 220 kV switchyard ○ Dismantling of 12 kV power panels ○ Dismantling of protection and automation systems ○ Dismantling of steel structures ○ Dismantling of foundations under the equipment ○ Dismantling of cable channels ○ Dismantling of power and control cables ○ Installation of power and commutation equipment of 220 kV switchyard ○ Installation of 12 kV power panels ○ Installation of control and protection systems ○ Installation of steel structures ○ Manufacturing and installation of the foundations under the equipment ○ Manufacturing and installation of the concrete covers of the cable channels ○ Installation of power and control cables ○ Installation of reserve diesel-generator ○ Commissioning of power and commutation equipment ○ Commissioning of reserve diesel-generator



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Project name	Rehabilitation of 220 kV substation at Shamb HPP
Customer	EFACEC Engenharia e Sistemas, S.A. (Portugal)
Year	2018 – 2021
Scope of work	<ul style="list-style-type: none"> ○ Dismantling of power and commutation equipment of 220 kV switchyard ○ Dismantling of 12 kV power panels ○ Dismantling of protection and automation systems ○ Dismantling of steel structures ○ Dismantling of foundations under the equipment ○ Dismantling of cable channels ○ Dismantling of power and control cables ○ Dismantling and re-allocation of 125 MVA transformers ○ Complete repair of 125 MVA transformers ○ Installation of power and commutation equipment of 220 kV switchyard ○ Installation of 12 kV power panels ○ Installation of control and protection systems ○ Installation of steel structures ○ Manufacturing and installation of the foundations under the equipment ○ Manufacturing and installation of the concrete covers of the cable channels ○ Installation of power and control cables ○ Installation of reserve diesel-generator ○ Commissioning of power and commutation equipment ○ Commissioning of reserve diesel-generator

Project name	Rehabilitation of 110 kV substation at Tatev HPP
Customer	EFACEC Engenharia e Sistemas, S.A. (Portugal)
Year	2018 – 2021
Scope of work	<ul style="list-style-type: none"> ○ Dismantling of power and commutation equipment at 110 kV switchyard ○ Dismantling of 12 kV power cubicles at switchgear ○ Dismantling of protection and automation system ○ Dismantling of steel structures ○ Dismantling of power and control cables ○ Dismantling and re-allocation of 80 MVA power transformer ○ Installation of power and commutation equipment at 110 kV switchyard ○ Installation of 12 kV power cubicles at switchgear ○ Installation of protection and automation system ○ Installation of steel structures ○ Installation of power and control cables ○ Installation of reserve diesel-generator ○ Commissioning of power and commutation equipment ○ Commissioning of reserve diesel-generator

Project name	Complete rehabilitation of 110/10, 16000 kVA transformer
Customer	“South Caucasian Railroad” CJSC
Year	2020
Scope of work	<ul style="list-style-type: none"> ○ Dismantling and re-allocation of the transformer ○ Supply and installation of the windings ○ Supply and re-filling of the transformer oil ○ Complete re-painting of the transformer body ○ Complete replacement of the electrical systems of the transformer ○ Complete rehabilitation of the 110 kV and 10kV bushings ○ Complete commissioning of the transformer



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Project name	Amulsar gold mine – Installation of electrical systems and sub-systems on the crusher platform
Customer	“Lydian Armenia” CJSC
Year	2018 - to be announced
Scope of work	<ul style="list-style-type: none"> ○ Installation of cable constructions and channels ○ Installation of power and control cables ○ Installation of external lighting poles ○ Installation of conveyor internal lighting ○ Installation of connection and end terminations ○ Complex commissioning of the system

Project name	Amulsar gold mine – Installation and commissioning of emergency generator for fuel station and Biodisc
Customer	“Lydian Armenia” CJSC
Year	2018
Scope of work	<ul style="list-style-type: none"> ○ Installation and commissioning of diesel generator set ○ Installation of power and control cable ○ Manufacturing and installation of steel fence ○ Civil construction works

Project name	Amulsar gold mine – Chief-montage and full set of commissioning works at Main 110/35/6 kV substation
Customer	“Lydian Armenia” CJSC
Year	2018
Scope of work	<ul style="list-style-type: none"> ○ Chief-montage of 110 kV power and commutation equipment ○ Chief-montage of steel structures ○ Full set of commissioning services for power and commutation equipment at switchyard ○ Commissioning of relay protection and automation systems

Project name	Amulsar gold mine – Commissioning of measurement equipment and LV systems
Customer	“Lydian Armenia” CJSC
Year	2018 – to be announced
Scope of work	<ul style="list-style-type: none"> ○ Commissioning of analog equipment ○ Commissioning of measurement systems ○ Commissioning of LV systems and equipment ○ Commissioning of control systems

Project name	Amulsar gold mine – LV system and container type substations installation
Customer	“Lydian Armenia” CJSC
Year	2017 – to be announced
Scope of work	<ul style="list-style-type: none"> ○ Construction of foundations for equipment ○ Installation of container type substations and E-houses ○ Installation of power cables ○ Installation of cable channels ○ Functional commissioning of container substations and E-houses ○ Installation and commissioning of power transformers ○ Installation of end terminations



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Project name	Rehabilitation of 110/10 kV substation “Charentsavan-3”
Customer	EFACEC Engenharia e Sistemas, S.A. (Portugal)
Year	2017 – to be announced
Scope of work	<ul style="list-style-type: none"> ○ Dismantling of equipment at 110 kV switchyard and 10 kV switchgear ○ Dismantling of existing control building, guard-house, equipment foundation and cable channels ○ Installation of 110 kV power and commutation equipment at switchyard ○ Installation of 10 kV panels at the switchgear ○ Installation of power and control cables ○ Installation of internal lighting system ○ Installation of fire-fighting system ○ Installation of steel structures ○ Supply and installation of foundations for power and commutation equipment ○ Construction of new control building and guard-house ○ Reconstruction of switchgear building ○ Reconstruction of external wall ○ Construction of water supply system ○ Supply and installation of cable channels ○ Commissioning of power and commutation equipment

Project name	Rehabilitation of 110 kV substation at Voxjhi HPP
Customer	Kapan Energy CJSC (Armenia)
Year	2017
Scope of work	<ul style="list-style-type: none"> ○ Consultation and supervision of design works and civil construction ○ Installation of equipment and machinery in 110 kV switchyard ○ Installation of equipment and machinery in control building and 6 kV switchgear ○ Installation of lightning protection system ○ Manufacturing and installation of steel structures, cable racks for 6 kV cables ○ Connection of all equipment to the substation earthing system ○ Installation of control, measuring, communication and relay protection panels for 110 kV and 6kV switchgears ○ Installation of LV control and power cables ○ Installation of MV control and power cables ○ Installation of auxiliary supply equipment - AC distribution boards, DC distribution boards, battery and chargers ○ Commissioning of all installed equipment and system

Project name	Extension of 110/35/6 kV substation Kashen
Customer	EFACEC Contracting Central Europe GmbH (Austria)
Year	2017
Scope of work	<ul style="list-style-type: none"> ○ Installation of 20 MVA, 110/35/6 kV power transformer ○ Performing of oil purification and heating activities ○ Commissioning of system with participation of Customer



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Project name	Construction of new 6/0.4 kV substation for Medical Center in Vanadzor
Customer	“Filishin” LLC (Armenia)
Year	2016-2017
Scope of work	<ul style="list-style-type: none"> ○ Supply, installation and commissioning of 1000 kVA, 6/0.4 kV transformers ○ Manufacturing and installation of 6kV power cubicles ○ Manufacturing and installation of 0.4 kV power cubicles ○ Manufacturing and installation of busbar system ○ Supply and installation of power and control cables ○ Installation of connection and end terminations ○ Installation of lighting system ○ Full set of commissioning works

Project name	Partial rehabilitation of 110 kV substation at “Yerevan-3 HPP”
Customer	“Power Engineering and Consulting PTE” LLC (Singapore)
Year	2016
Scope of work	<ul style="list-style-type: none"> ○ Dismantling of power cables ○ Dismantling of 110 kV surge arresters ○ Dismantling of steel concrete constructions ○ Dismantling of steel structures, busbar systems and post insulators ○ Reconstruction of cable tranches ○ Installation of double-wall pipes ○ Installation of post insulators ○ Installation of busbar system ○ Installation of power cables ○ Installation of end-terminations ○ Commissioning works

Project name	Repair of 10 kV busbar system at Hrazdan HPP
Customer	“Zenon” LLC (Armenia)
Year	2016
Scope of work	<ul style="list-style-type: none"> ○ Supply and installation of polymer post insulators ○ Commissioning works

Project name	Electrification of Oil-refinery at the station Karmir Blur
Customer	Armenian International Airports JSC (Armenia)
Year	2016
Scope of work	<ul style="list-style-type: none"> ○ Design of electrification ○ Supplying and installation of LED lamps ○ Installation of control cubicles ○ Installation of power cables ○ Civil construction works

Project name	Reconstruction of 10 kV cable line between SS-219 and SS-165, SS-64 and SS-25, SS -38 and E-65B in Gyumri
Customer	“Electrical Networks of Armenia” CJSC
Year	2016
Scope of work	<ul style="list-style-type: none"> ○ Installation of power cables ○ Installation of connection and end terminations ○ Civil construction works for cable trench construction and rehabilitation of asphalt roads afterwards



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Project name	Partial re-allocation of 220 kV transmission line Meghri-1
Customer	Zangezur Copper Molibdenum Combinat CJSC (Armenia)
Year	2015-2016
Scope of work	<ul style="list-style-type: none"> ○ Supply and installation of 6 (six) 220 kV transmission line steel structures ○ Dismantling of 4 (four) 220 kV transmission line steel structures

Project name	Construction of 10 kV substation and OHL for copper mine Lichk
Customer	Zangezur Copper Molibdenum Combinat CJSC (Armenia)
Year	2015-2016
Scope of work	<ul style="list-style-type: none"> ○ Supply and installation of container type substation ○ Manufacturing, supply and installation of necessary steel structures and foundations for the substation and OHL ○ Complex testing and commissioning of installed equipment

Project name	Construction of new 220 kV transmission line Hrazdan-Shinuhayr
Customer	Kalpataru Power Transmission LTD (India)
Year	2015
Scope of work	<ul style="list-style-type: none"> ○ Manufacturing of the form-boxes for the monolith foundations

Project name	Rehabilitation of 35/6 kV Substation-1, Substation-2 and Substation-3
Customer	"Armenia International Airports" CJSC
Year	2015
Scope of work	<ul style="list-style-type: none"> ○ Complex repair of protection relay system with the replacement of necessary parts ○ Complex commissioning of the of relay protection, alarm, automation systems and oil circuit breakers

Project name	Construction of new 110 kV substation "Kashen"
Customer	EFACEC Contracting Central Europe (Austria)
Year	2014-2015
Scope of work	<ul style="list-style-type: none"> ○ Consultation and supervision of design works and civil construction ○ Installation of equipment and machinery in 110 kV switchyard ○ Installation of equipment and machinery in control building, 35 kV switchgear and 10 kV switchgear ○ Installation of lightning protection system ○ Manufacturing and installation of steel structures, incl. OHL Gantries, busbar and equipment support as well as other supporting structures as cable racks for 35 and 10 kV cables ○ Installation of electromechanical materials like HV clamps, ACSR conductors, busbars, glass chain insulators ○ Connection of all equipment to the substation earthing system ○ Installation of outdoor lighting system on the 110 kV switchyard ○ Installation of control, measuring, communication and relay protection panels for 110 kV, 35kV and 10kV switchgears ○ Installation of LV control and power cables ○ Installation of MV control and power cables ○ Installation of auxiliary supply equipment - AC distribution boards, DC distribution boards, battery and chargers ○ Commissioning of all installed equipment and system



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Project name	Commissioning of equipment at copper mine Teghout
Customer	Simartek CJSC (Armenia)
Year	2014
Scope of work	<ul style="list-style-type: none"> ○ Primary circuit resistance check ○ Testing of busbar system and high-voltage circuit breaker ○ Circuit breaker flow resistance check ○ Transformer isolation resistance check ○ Current transformer magnetic curves creation ○ Voltage transformation coefficient ○ Secondary circuit check ○ Complex commissioning of 10 and 6 kV power cells

Project name	Construction of new 110 kV substation "Matur"
Customer	EFACEC Contracting Central Europe (Austria)
Year	2013-2014
Scope of work	<ul style="list-style-type: none"> ○ Installation of equipment and machinery in 110 kV switchyard ○ Installation of equipment and machinery in control building, 35 kV switchgear and 10 kV switchgear ○ Installation of lightning protection system ○ Manufacturing and installation of steel structures, incl. OHL Gantries, busbar and equipment support as well as other supporting structures as cable racks for 35 and 10 kV cables ○ Installation of electromechanical materials like HV clamps, ACSR conductors, busbars, glass chain insulators ○ Connection of all equipment to the substation earthing system ○ Installation of outdoor lighting system on the 110 kV switchyard ○ Installation of control, measuring, communication and relay protection panels for 110 kV, 35kV and 10kV switchgears ○ Installation of LV control and power cables ○ Installation of MV control and power cables ○ Installation of auxiliary supply equipment - AC distribution boards, DC distribution boards, battery and chargers ○ Commissioning of all installed equipment and system

Project name	Construction of Dilijan International School
Customer	RD Construction Management (Russian Federation)
Year	2013-2014
Scope of work	<ul style="list-style-type: none"> ○ Installation of 42,5 km of power cable lines ○ Construction of earthing system for "Medical Center" building ○ Reallocation of 10 kV OHL ○ Installation of outdoor lighting system ○ Construction of low current sewage system ○ Installation of internal lighting system ○ Installation of control cubicles ○ Commissioning of power cubicles ○ Manufacturing of foundations for the lighting towers



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Project name	Construction of new 10/0.4 kV SS and 10 kV OHL "Gyumri City"
Customer	"Electrical Networks of Armenia" CJSC
Year	2012-2013
Scope of work	<ul style="list-style-type: none"> ○ Installation of steel-concrete supports ○ Manufacturing of earthing system and installation of the wire ○ Installation of power transformer ○ Installation of power panels ○ Installation of power cables ○ Manufacturing and installation of strip foundations ○ Soil works ○ Construction of the substation building

Project name	Manufacturing of steel structures
Customer	"South Caucasian Railroad" CJSC
Year	2012
Scope of work	<ul style="list-style-type: none"> ○ Manufacturing of steel structures for the train stations

Project name	Rehabilitation of 6 kV substations N1 and N4 at Airport "Shirak".
Customer	"Armenian International airports" CJSC
Year	2012
Scope of work	<ul style="list-style-type: none"> ○ Repair and re-commissioning of relay protection system ○ Repair and re-commissioning of automatic protection system ○ Repair and re-commissioning of oil filled circuit breakers system ○ Repair and re-commissioning of alarm system

Project name	Construction of second power supply scheme for airport "Shirak"
Customer	"Armaeronavigation" CJSC
Year	2012
Scope of work	<ul style="list-style-type: none"> ○ Civil construction works ○ Installation of steel pipes ○ Installation of power cables and terminations ○ Installation of compact transformer substation ○ Manufacturing and installation of distributional panels

Project name	Inspection and repair of power transformers
Customer	"GeoProMiningGold" LLC
Year	2012
Scope of work	<ul style="list-style-type: none"> ○ Inspection and repair of 6kV, 63 kVA power transformers ○ Inspection and repair of 6kV, 160 kVA power transformers ○ Inspection and repair of 6kV, 250 kVA power transformers ○ Inspection and repair of 6kV, 400 kVA power transformers ○ Inspection and repair of 6kV, 630 kVA power transformers ○ Inspection and repair of 6kV, 1000 kVA power transformers ○ Inspection and repair of 6kV, 1600 kVA power transformers



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Project name	Installation works at branch" South"
Customer	"Electrical Networks of Armenia" CJSC
Year	2011
Scope of work	<ul style="list-style-type: none"> ○ Removal of 6 kV power panels ○ Removal of 10 kV power panels ○ Installation of 6 and 10 kV power cells ○ Civil construction works ○ Installation of the power cables ○ Commissioning of the installed equipment

Project name	Construction of pump station Artashar
Customer	Armenian Branch of SADE (France)
Year	2011
Scope of work	<ul style="list-style-type: none"> ○ Delivery and installation of the power supply panels ○ Delivery and installation of the power cables ○ Installation of the earthing system ○ Installation of the current protection system in the main pump power panel ○ Installation of the external lighting system of the pump station ○ Complex commissioning of the installed equipment

Project name	Repair works on 220 kV SS "Kamo"
Customer	CJSC "High voltage electrical networks of Armenia"
Year	2011
Scope of work	<ul style="list-style-type: none"> ○ Installation of 35 kV cable end-terminations

Project name	Construction of Hrazdan TPP UNIT N 5
Customer	"Interautomatika" JSC (Russian Federation)
Year	2010-2011
Scope of work	<ul style="list-style-type: none"> ○ Installation of control, measurement and automation equipment of main building, Heller tower, cost pump station, gas regulatory and gas preparatory buildings, chimney, pressurized air compressor building ○ Installation of power supply panels and UPS equipment of technical programming complex ○ Installation of controller cubicles, communication devices, intermediary terminals, intermediary relays, secondary converters of mechanical quantities and vibrations, over speeding protection ○ Installation of network equipment panels ○ Installation of control panels ○ Installation of technical programming complex components on the unit control panel, including installation of the common usage screens ○ Installation and connection of power supply cables of technical programming complex ○ Installation and connection of network cables ○ Installation of power unit simulator equipment ○ Installation of the communication systems with the local control systems (gas turbine, gas pressurizing station, erection system and synchronization of the steam turbine generator, switchyard 220 kV, water heating boiler)



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Project name	First Stage of SCADA/COMMUNICATION Project
Customer	ABB AB Network Management (Sweden)
Year	2008-2011
Scope of work	<ul style="list-style-type: none"> ○ Removal of debris (of old equipment), clearing position for the new equipment ○ Digging of cable routes in outdoor switchyards ○ Erection of cubicles including preparatory civil works ○ Installation of cubicle support bars, cable trenches and cable ladders ○ Earthing of cubicles and wall mounted panels ○ Installation of cables between RTUs and plant sources, between AC/DC distribution and RTUs and between RTUs and Telecom cabinets ○ Fitting of glands for a/m cables ○ Termination, applying ferrules/lugs of cables and wires ○ Installation of transducers and auxiliary relays (in plant cubicles) as applicable ○ Termination and testing of modified circuits in plant ○ Wiring check of all installed cables/wiring (continuity test) ○ Testing of new and existing equipment such as transducers, command interposing relays, indication and alarm relays ○ Installation of RTU, battery, battery charges and generators ○ Testing of each signal from plant source up to terminals in the SCADA equipment

Project name	First Stage of SCADA/COMMUNICATION Project
Customer	ELTEL Networks Oy (Finland)
Year	2008-2011
Scope of work	<ul style="list-style-type: none"> ○ Installation of cables (including fixing) ○ Installation of OPAC cable in the pipe ○ Works for DPLC (Hrazdan HPP - Sevan HPP) ○ Works for the existing DPLC (SS Agarak - SS Shinuair) ○ Works for the existing DPLC (Spandaryan HPP - Shamb HPP) ○ Excavation and preparation of the trench for the OPAC cable ○ Civil works for DPLC ○ Manufacturing and installation of foundations

Project name	Rehabilitation of 110 kV substation Vanadzor-1
Customer	SIEMENS AG (Austria)
Year	2009-2010
Scope of work	<ul style="list-style-type: none"> ○ Delivery and installation of 110 kV power equipment (power transformers, rotary disconnectors, current transformers, voltage transformers, surge arresters and support insulators) ○ Delivery and installation of all cable connections ○ Delivery and installation of power, control and protection cables ○ Installation of new control equipment ○ Delivery, installation and commissioning of all terminal boxes for the measuring transformers ○ Replacement of all earthing devices including connection of new equipment and all portals ○ Installation of lighting system ○ Delivery and installation of the secondary switchgear ○ Delivery, installation and commissioning wave-layers for 220 kV PLC transmission including the fixing and earthing equipment ○ Commissioning of PLC equipment ○ Delivery and installation of foundations under the power equipment



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Project name	"Kajaran/Armenia. 110/35/6 kV substation "Combine"
Customer	AREVA Energietechnik GmbH (Germany)
Year	2009-2010
Scope of work	<ul style="list-style-type: none"> o Site supervision for the installation part of the works

Project name	"Kajaran/Armenia. 110/10 kV Substation "Aghats"
Customer	AREVA Energietechnik GmbH (Germany)
Year	2009-2010
Scope of work	<ul style="list-style-type: none"> o Site supervision for the installation part of the works

Project name	Rehabilitation of "Khrami-2" HPP (Georgia)
Customer	LANCEFORD COMMERCIAL INC
Year	2008
Scope of work	<ul style="list-style-type: none"> o Commissioning of batteries, chargers and inverters o Commissioning of the 220 V and 48 V DC panels o Commissioning of 0.4 kV distribution panel o Commissioning of 10.5 kV distribution panel

Chief Executive Officer

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