



ENTEGRO Ltd.



YOUR PARTNER FOR POWER ENGINEERING – AGENCIES AND CONSULTING FOR POWER STATIONS

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**A. Steam Turbines P.M. / LMZ Auxiliary Equipment**Reference List of General maintenance of Steam Turbine K-300-170 LMZ / K-200-130 LMZ of Entegro LTD.

A/A	Customer	Description of works / Type of Steam Turbine	Working Period
1	PPC S.A./ Aghios Georgios P.P.(Unit 7), Kardia P.P. (Units 3 / 4), Aghios Dimitrios P.P (Units 3 / 4), Amindeon P.P.(Units 1 / 2), Melitis P.P. (Unit 1)	Partial and Full maintenance of Steam Turbines K-300-170 (240) / K-200-130 LMZ by providing technical advice and repairing damage to various machine links.	1992-2011
2	PPC S.A./ Amindeon P.P.(Unit 2),	General maintenance of Steam Turbine K-300-170 LMZ.	1996
3	PPC S.A./ Aghios Georgios P.P.(Unit 9)	General maintenance of Steam Turbine K-200-130 LMZ.	1997
4	PPC S.A./ Aghios Georgios P.P. (Unit 9)	General maintenance of Steam Turbine K-200-130 LMZ.	2000
5	PPC S.A./ Kardia P.P. (Unit 4)	General maintenance of Steam Turbine K-300-170 LMZ.	2002
6	PPC S.A./ Kardia P.P. (Unit 4)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2003
7	PPC S.A./ Kardia P.P. (Unit 3)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2004
8	PPC S.A./ Amindeon P.P. (Unit 2)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2004
9	PPC S.A./ Amindeon P.P. (Unit 1)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2004
10	PPC S.A./ Aghios Georgios P.P. (Unit 9)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2005
11	PPC S.A./ Amindeon P.P. (Unit 1)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2007
12	PPC S.A./ Aghios Dimitrios P.P.(Unit 4)	General maintenance of Steam Turbine K-300-170 LMZ.	2008
13	PPC S.A./ Amindeon P.P. (Unit 2)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2009
14	PPC S.A./ Aghios Dimitrios P.P. (Unit 4)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2010



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15	PPC S.A./ Kardia P.P. (Unit 4)	General maintenance of Steam Turbine K-300-170 LMZ.	2010
16	PPC S.A./ Melitis P.P.	General maintenance of Steam Turbine K-300-240 LMZ.	2012
17	PPC S.A./ Amindeon P.P. (Unit 1)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2015
18	PPC S.A./ Amindeon P.P. (Unit 2)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2015
19	PPC S.A./ Kardia P.P. (Unit 3)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2015
20	PPC S.A./ Melitis P.P. (Unit 1)	Partial maintenance of Steam Turbine K-300-170 LMZ.	2016
21	PPC S.A./ Kardia P.P. (Unit 4)	General maintenance of Steam Turbine K-300-170 LMZ.	2017



Reference list of Entegro / UralVTI for non-destructive control methods of steam turbines LMZ

A/A	Time of works execution (year and month of the beginning and end)	Customer (name, address, contact person, indicating the position, contact phone number)	Brief of description works
1.	October, 2008	PPC S.A., SES Aghios Dimitrios, Unit 4, Kozani, Greece	Integrated study of rotors HP, MP and LP of turbine K-300-170 LMZ
2.	September – October, 2009	PPC S.A., SES Amindeon, Unit 2, Ptolemaida, Greece	Integrated study of HP (2 pcs), MP (2 pcs) and LP of turbine K-300-170 LMZ
3.	October, 2009	SES Endesa Costanera, Buenos Aires, Argentina	Integrated study of LP rotors of turbine K-300-240 LMZ.
4.	October, 2010	PPC S.A., SES Kardia, Unit 4, Kozani – Ptolemaida	Preparation and integrated testing of steel of HP/LP turbine's rotors, turbine K-300-170 LMZ / Siemens.
5.	October, 2011	PPC S.A., SES Kardia, Unit 3, Kozani - Ptolemaida	Preparation and integrated testing of steel MP/LP turbine's rotors turbine K-300-170 LMZ / Siemens
6.	October, 2011	PPC S.A., SES Aghios Dimitrios, Unit 5, Kozani, Greece	Preparation works and integrated testing of steel LP last stages turbines 360 MW Ansaldo
7.	September, 2012	PPC S.A., SES Melitis, Unit 1, Florina, Greece	Integrated study of rotors HP, MP and LP of turbine K-330-24.3 LMZ
8.	October, 2015	PPC S.A., SES Aghios Dimitrios, Unit 4, Kozani, Greece	Preparation works and integrated study of steel MP and LP rotors of turbine K-300-170 LMZ



Reference List of Control and adjustment of suspensions of Steam Turbine
K330-23.5 LMZ of Entegro LTD.

A/A	Customer	Description of works / Type of Steam Turbine	Working Period
1	PPC S.A./ Melitis P.P.	Control and adjustment of suspensions of boiler's steam engines on Cold and Hot condition and measurement of shoe reactions on HPC and LPC of steam turbine K330-23.5 LMZ	2011
2	PPC S.A./ Melitis P.P.	Control and adjustment of suspensions of boiler's steam engines on Cold condition and measurement of shoe reactions on HP and LP of steam turbine K330-23.5 LMZ according main project	2012
3	Elpedison Power Plant	LP-IP-HP Hangers hot inspection	2013
4	Elpedison Power Plant	Control and adjustment boiler's suspensions in cold condition and measurement	2013
5	PPC S.A./ Kardia P.P.	Technical support during the 2011 general maintenance of turbine Unit.III	2011
6	PPC S.A./ Kardia P.P.	Control and adjustment Overheat Ib to Overheat II Unit IV	2013
7	PPC S.A./ Kardia P.P.	Control and adjustment Overheat Ib to Overheat II Unit IV	2013
8	PPC S.A./ SES Chania	Chain Suspension Control of Combined Cycle Unit SES Chania	2013
9	PPC S.A./ SES Chania	Adjusting Pipe suspension of Combined Cycle Unit SES Chania	2013
10	PPC S.A./ SES Chania	Technical Work on Replacement of Pipe Suspensions Combined Cycle Unit	2014
11	PPC S.A./ SES Melitis	Control and adjustment of steam turbine suspensions and measurements of shoe reactions of steam turbine K330-23.5 LMZ	2015
12	PPC S.A./ SES Komotinis	Control and adjustment of steam turbine suspensions	2017
13	PPC S.A./ SES Melitis	Control and adjustment of the suspensions of boiler's steam engines and measurement of shoe reactions of steam turbine K330-23.5 LMZ	2018



Reference List «Supply of Pre-heaters L.P. & H.P. Units SES (PPC S.A.)»
Entegro Ltd – Power Machines / Taganrog Boiler & Turbine Factory (Russia)

A/A	Customer	Description of works / Type of Steam Turbine	Working Period
1	PPC S.A./ Kardia P.P.	Supply of heat exchanger spare parts, cooling oil lubrication (МП-330-300-2) Troitsky Electromechanical Plant Turbogenerators Units. III-IV	2003
2	PPC S.A./ Aghios Georgios P.P.	Supply and installation of L.P. pre-heater N 4 Unit.9	2004
3	PPC S.A./ Aghios Georgios P.P.	Supply of L.P. water pre-heater N 2 Unit.9	2009-2010
4	PPC S.A./ Aghios Georgios P.P.	Material supply and manufacture of H. P. water pre-heater N 2 Unit.8	2010-2011
5	PPC S.A./ Kardia P.P.	Supply of spare parts and segments of H.P. pre-heater N 6 type ПБ 1250-360-24/1978 Unit.3.	2015
6	PPC S.A./ Melitis P.P.	Supply of Single plane spiral of H.P. pre-heater	2017

Reference List «Supply of Pumps and Condensate Spare Parts Units on SES (PPC S.A.)»
Entegro Ltd - Nasosenergomash (Sumy, Ukraine)

A/A	Customer	Description of works / Type of Steam Turbine	Working Period
1	PPC S.A./ Melitis P.P.	Supply of spare parts KSB-500-220-1 type B concentrate pumps	2013
2	PPC S.A./ Melitis P.P.	KCB-500-200 type B condenser pump spare parts	2016

**B. Generator P.M. / Electrosila Auxiliary Equipment**Reference list General maintenance of Generator TBB-300-2Y3 AO Electrosila and TBB-200-2T AO Electrosila of Entegro Ltd

A/A	Customer	Description of works / Type of Generator	Working Period
1.	PPC S.A./ Aghios Georgios P.P., Kardia P.P., Aghios Dimitrios P.P, Amindeon P.P.	Partial and Full maintenance of Generators by providing technical advice and repairing damage to various machine links.	1992-2011
2.	PPC S.A./ Amindeon P.P.(Unit 2)	General maintenance of Generator TBB-300-2Y3 AO Electrosila with the installation of dynamic accumulators	1996
3.	PPC S.A./ Amindeon P.P.(Unit 1)	General maintenance of Generator TBB-300-2Y3 AO Electrosila with the installation of dynamic accumulators	1997
4.	PPC S.A./ Aghios Georgios P.P.(Unit 9)	General maintenance of Generator TBB-300-2Y3 AO Electrosila with the installation of dynamic accumulators	2000
5.	PPC S.A./ Kardia P.P. (Unit 4)	General maintenance of Generator TBB-300-2Y3 AO Electrosila with the installation of dynamic accumulators	2002
6.	PPC S.A./ Kardia P.P. (Unit 4)	Generator Upgrade Unit.4	2003
7.	PPC S.A./ Kardia P.P. (Unit 3)	General maintenance of Generator TBB-300-2Y3 AO Electrosila with the installation of dynamic accumulators	2004
8.	PPC S.A./ Amindeon P.P.(Unit 2)	Generator Repair Unit.2	2004
9.	PPC S.A./ Amindeon P.P.(Unit 1)	Generator Repair Unit.1	2004
10.	PPC S.A./ Aghios Georgios P.P.(Unit 9)	General maintenance of Generator TBB-200-2T AO Electrosila	2005
11.	PPC S.A./ Amindeon P.P.(Unit 1)	Generator Repair Unit.1	2007
12.	PPC S.A./ Aghios Dimitrios P.P.(Unit 4)	General maintenance of Generator TBB-300-2Y3 AO Electrosila	2008
13.	PPC S.A./ Amindeon P.P.(Unit 2)	Maintenance work on the generator rotor TBB-300-2Y3 AO Electrosila by tightening of dynamic accumulators	2009



14.	PPC S.A./ Agios Dimitrios P.P.(Unit 4)	Installing an additional bearing on the free end of the Generator rotor of Unit.4	2010
15.	PPC S.A./ Kardia P.P. (Unit 4)	General maintenance of Generator TBB-300-2Y3 AO Electrosila by tightening of dynamic accumulators	2010
16.	PPC S.A./ Melitis P.P. (Unit 1)	Provision of Specialized Technical Support and Maintenance Services for Steam, Generator and Excitation Equipment of JSC Power Machines	2012
17.	PPC S.A./ Amindeon P.P.(Unit 1)	Provision of Specialized Technical Support of Generator's equipment. General Inspection	2015
18.	PPC S.A./ Amindeon P.P.(Unit 2)	Provision of Specialized Technical Support of Generator's equipment. General Inspection	2015
19.	PPC S.A./ Kardia P.P. (Unit 3)	Provision of Specialized Technical Support of Generator's equipment. General Inspection	2015
20.	PPC S.A./ Melitis P.P. (Unit 1)	Provision of Specialized Technical Support of Generator's equipment. General Inspection	2016
21.	PPC S.A./ Kardia P.P. (Unit 4)	Provision of Specialized Technical Support of Generator's equipment. General Inspection	2017

Reference List « Supply of spare parts and excitation systems of generators Electrosila» (Power Machines)

A/A	Customer	Description of works / Type of Generator TBB-350-2Y3	Working Period
1	PPC S.A./ Melitis P.P.	Spare parts for excitation of generator maintenance	2006
2	PPC S.A./ Melitis P.P.	Spare parts for excitation of generator	2009
3	PPC S.A./ Melitis P.P.	Spare parts for excitation of generator	2010
4	PPC S.A./ Melitis P.P.	Spare parts for excitation of generator	2013
5	PPC S.A./ Melitis P.P.	Spare parts for excitation of generator	2014



C. Steam Turbine / Generator Vibration Equipment

Reference List of works Supply and Installation of vibrations monitoring equipment and diagnostic of steam turbines K-300-170 LMZ / TBB-300-2Y3 Electrosila SES (PPC S.A., Greece).

a/a	Power Station	Description of Works	Period of Works
1.	SES Aghios Dimitrios / Unit 3	Supply works and installation of vibrations monitoring system and diagnostic of steam turbine K-300-170 LMZ / TBB-300-2Y3 Electrosila Bently Nevada 3500 / VIDAS	2003
2.	SES Aghios Dimitrios / Unit 4	Supply works and installation of vibrations monitoring system and diagnostic of steam turbine K-300-170 LMZ / TBB-300-2Y3 Electrosila Bently Nevada 3500 / VIDAS	2007
3.	SES Amintaion – Filotas / Units 3 / 4	Supply works and installation of vibrations monitoring system and diagnostic of steam turbine K-300-170 LMZ / TBB-300-2Y3 Electrosila Vibrometer VM600 / VIDAS	2007
4.	SES Kardias / Units 3 / 4	Supply works and installation of vibrations monitoring system and diagnostic of steam turbine K-300-170 LMZ / TBB-300-2Y3 Electrosila Schenk 4000 / VIDAS	2009



VM600 (Vibrometer - Meggitt) Vibrosmart monitoring system

A. Reference List for study, supply and installation of VM600 (Vibrometer - Meggitt) Vibrosmart monitoring system.

A/A	Customer	Description of works	Working Period
1	PPC S.A./ SES Amintaion (Unit 2) (Greece)	Study, supply and installation work of VM600 (Vibrometer – Meggitt) vibration monitoring system on Steam Turbine K-300-170 LMZ / Generator Electrosila TBB-300-2Y3 (Russia)	2008

B. Reference List for service works of VM600 (Vibrometer - Meggitt) Vibrosmart monitoring system (including necessary spare parts).

A/A	Customer	Description of works	Working Period
1	PPC S.A./ SES Amintaion (Unit 2) (Greece)	Execution of service works of VM600 (Vibrometer – Meggitt) vibration monitoring system on Steam Turbine K-300-170 LMZ / Generator Electrosila TBB-300-2Y3 (Russia)	2010
2	PPC S.A./ SES Amintaion (Unit 2) (Greece)	Execution of service works of VM600 (Vibrometer – Meggitt) vibration monitoring system on Steam Turbine K-300-170 LMZ / Generator Electrosila TBB-300-2Y3 (Russia)	2013
3	PPC S.A./ SES Amintaion (Unit 2) (Greece)	Execution of service works of VM600 (Vibrometer – Meggitt) vibration monitoring system on Steam Turbine K-300-170 LMZ / Generator Electrosila TBB-300-2Y3 (Russia)	2014



Reference List for supply of Generator's spare parts for VM600 for Turbine K-300-170 LMZ / TBB-300-2Y3 Electrosila.

A/A	Customer	Description of works	Working Period
1	PPC S.A./ SES Amintaion P.P. (Greece)	Supply spare parts for VM600 System	2012
2	PPC S.A./ SES Amintaion P.P. (Greece)	Supply spare parts for VM600 System	2014
3	PPC S.A./ SES Amintaion P.P. (Greece)	Supply spare parts for VM600 System	2017
4	Elpedison Power (Thisvi, CCPP) Gasturbine equipment (Greece)	Supply spare parts for VM600 System	2017
5	Hellenic Petroleum Gasturbine equipment (Athens, Greece)	Supply spare parts for VM600 System	2017
6	TE-TO CCPP Gasturbine equipment (Skopje, FYROM)	Supply spare parts for VM600 System	2017
7	TE-TO CCPP Gasturbine equipment (Skopje, FYROM))	Supply spare parts for VM600 System	2016



Reference List for study and engineering works for Vibrosmart / Vibrosight vibration – monitoring – diagnostic system.

A/A	Customer	Description of works / Type of Steam Turbine	Working Period
1	PPC S.A./ Lignite mining of Kardia	Study and engineering works for Vibrosmart / Vibrosight VMP system on two (2) complexes of excavation Units (Manufacturer: Takraf)	2017
2	PPC S.A./ SES Amintaion P.P. (Greece)	Study and engineering works for Vibrosmart / Vibrosight VMP system on two (2) complexes of Electric motors / pumps of main on Units 2 x 300 MW (Manufacturer: LMZ, Russia)	2016
3	HPP Strezhevo (FYROM, Skopje)	Study and engineering works for Vibrosmart / Vibrosight VMP system on three (3) complexes of Hydroturbines / Generators 2 x 800 KW Manufacturers: Hydroturbine: Energoremont (Bulgaria) Generator: Uljanik (Croatia)	2018

List for study, supply and installation of Vibrosmart / Vibrosight system for Hydropower Plants.

A/A	Customer	Description of works	Working Period
1	PPC S.A./ HPP Ilarionas (Units 1 / 2) (Greece)	Study, supply and installation of Vibrosmart / Vibrosight vibration – monitoring – diagnostic system on Hydroturbines 2 x 80 MVA ALSTOM (India)	2016
2	PPC S.A./ HPP Polifitos (Unit 3) (Greece)	Study, supply and installation of Vibrosmart / Vibrosight vibration – monitoring – diagnostic system on Hydroturbines 1 x 120 MVA ALSTOM (France)	2017



D. Power Transformer Equipment

Reference List for supply of EMB spare parts.

A/A	Customer	Description of works	Working Period
1	PPC S.A./ Complex of Acheloos / HPP Kastraki (Greece)	Supply of EMB spare parts Buchholz Relay	2018
2	PPC S.A./ Complex of Acheloos / HPP Kastraki (Greece)	Supply of EMB spare parts Buchholz Relay	2018
3	LLC Entegro (St. Petersburg, Russia)	Supply of EMB spare parts Buchholz Relay	2018

Reference List for supply of Qualitrol measuring devices.

A/A	Customer	Description of works	Working Period
1	PPC S.A./ Complex of Acheloos / HPP Kremasta (Greece)	Supply of Qualitrol measuring devices	2016
2	PPC S.A./ Complex of Acheloos / HPP Kastraki (Greece)	Supply of Qualitrol measuring devices	2017
3	PPC S.A./ Complex of Acheloos / HPP Kastraki (Greece)	Supply of Qualitrol measuring devices	2018



Reference List of Power Transformers

A/A	Customer	Description of works	Working Period
1	PPC S.A./ Kardias P.P.	Investigation of damage on general auxiliary Power Transformer 30/40 MVA of Unit III, manufacturing: ZTR (Ukraine)	2004
2	PPC S.A./ Kardias P.P.	Tests and measurements in Power Transformer Unit IV in cooperation with ZTR (Ukraine)	2005
3	PPC S.A./ Kardias P.P.	Inspection of Power Transformer Alstom Savoisiene 360MVA – 21/400kV	2010
4	PPC S.A./ Melitis P.P.	Inspection and diagnostic of Main Power Transformer TDC-400000 kVA ZTR (Ukraine)	2015
5	PPC S.A./ Complex of Acheloos / HPP Kastraki (Greece)	General maintenance of four (4) Power Transformers Hitachi 4 x 90 MVA	2018