

			<b>TECHNICAL SPECIFICATION</b> <b>Техническа спецификация</b>					
			Документ нр. <i>Document no.</i> <b>90MKA10-PB401</b>			Страница <b>1</b> от <b>7</b> <i>Sheet of</i>		
Проект <i>Project</i> <b>MARITZA EAST III POWER PLANT</b>			Код <i>Security Index</i>					
Име <i>Title</i> <b>Tests, inspections and conservation of spare rotor at Contour Global Maritza East 3</b> <b>TECHNICAL SPECIFICATION</b>								
Система <i>System</i> <b>MKA</b>		Тип документ <i>Document Type</i> <b>PB</b>		Дисциплина <i>Discipline</i> <b>&amp;</b>		Файл <i>File</i> 90MKA10-PB401-00.doc		
REV 00		Описание на ревизиите / <i>Description of Revisions</i> FOR TENDER (TR)						
00		18.12.19	TR	I. Dimitrov		T. Kolev	P. Gospodinov	S. Bodurov
REV	Дата <i>Date</i>	Обхват <i>Scope</i>	Подготвил <i>Prepared by</i>	Сътрудници <i>Co-operations</i>	Проверил <i>Checked by</i>	Одобрил <i>Approved by</i>	Издам <i>Issued by</i>	

	<b>MARITZA III POWER PLANT</b>		Документ по. Document no. <b>90MKA10-PB401</b>	
	<b>TECHNICAL SPECIFICATION</b>		REV. 00	18.12.19
	Техническа спецификация		Страница Sheet	2 от of 7

## INDEX

1.	Subject .....	3
2.	General power plant characteristic.....	3
3.	Description of spare rotor works .....	3
3.1	Equipment subject to maintenance works.....	3
3.2	requirements by owner for performing maintenance activities.....	3
4.	Technical characteristic.....	4
5.	Obligations, Limits and exclusions .....	4
5.1	Supplier .....	4
5.1.1	Scope of Supplier's activities .....	4
5.1.2	Working time.....	5
5.1.3	Schedule.....	5
5.1.4	Cleaning .....	5
5.1.5	Site facilities.....	5
5.1.6	Catering.....	6
5.1.7	Site electricity supplies .....	6
5.1.8	Compressed air supply.....	6
5.1.9	Consumables.....	6
5.1.10	Safety.....	6
5.2	Owner.....	7
6.	Tests .....	7
7.	Warranty.....	7
8.	Document of reference .....	7
9.	Attachments.....	7

	<b>MARITZA III POWER PLANT</b>		Документ но. Document no. <b>90MKA10-PB401</b>	
	<b>TECHNICAL SPECIFICATION</b>		REV. 00	18.12.19
	Техническа спецификация		Страница Sheet	3 от of 7

## 1. SUBJECT

Subject of work are the following services:

Tests, inspections and conservation of spare rotor at Contour Global Maritza East 3 before maintenance campaign 2020 (it begins at 01.07.2020).

## 2. GENERAL POWER PLANT CHARACTERISTIC

The following are the general particulars governing the design and working of the plant.

The Maritza East III thermal power plant is located approximately 60 km south east of Stara Zagora, 10 km south east of the town of Galabovo and 2 km north of the village of Mednikarovo in the Haskovo district, close to the Troyanovo III open-cast mine.

Detailed information concerning generator is given in document 30MKA10-GB001 – Technical-operational documentation of turbo generator TWW 227, 1-2A.

## 3. DESCRIPTION OF SPARE ROTOR WORKS

Summary of the maintenance works which will be carried out on the spare rotor:

- De-conservation;
- Electrical tests and measurements;
- Re-conservation.

Finally, the Supplier will issue maintenance reports containing the all technical measurements, findings and solution adopted.

### 3.1 EQUIPMENT SUBJECT TO MAINTENANCE WORKS

The following equipment will subjected to overhaul and/or check according to service manuals. It is required to Supplier the constant supervision during all maintenance phases described.

**Spare rotor for Turbo Generator TWW 227, 1-2A.**

### 3.2 REQUIREMENTS BY OWNER FOR PERFORMING MAINTENANCE ACTIVITIES

- Rotor conservation involves protecting all sliding surfaces of the rotor shaft and half-coupling surfaces with anti-corrosive agents and keeping the remaining surfaces of the rotor and retaining rings clean. While performing conservation operations one should be aware of volatile substances and protect respiratory tracts. Cotton gloves should be worn throughout the packing process.
- All agents for cleaning rotor shaft ends, open metal surfaces, prior to anti-corrosive coating, degreasing and removing coats must be approved by Owner.
- The surface to be coated with an anti-corrosive agent should be carefully prepared so that it permanently adheres to the surface and provides a reliable, long lasting protection for the intended period. Therefore, one should:
  - ✓ Clean the surface carefully so that is free from any foreign matter,
  - ✓ Wash with flannel or linen cloth soaked in painter's naphtha and then clean with isopropyl alcohol; degrease with acetone to finish; remaining penetrates should be earlier removed with cleaning liquids.

	<b>MARITZA III POWER PLANT</b>		Документ по. Document no. <b>90MKA10-PB401</b>	
	<b>TECHNICAL SPECIFICATION</b>		REV. 00	18.12.19
	Техническа спецификация		Страница Sheet	4 от of 7

- ✓ After inspecting the surface and drying coat an uniform layer of an agent using a spray or brush; leave to congeal (vaporization of the volatile matter) for 4 hours.
- Coating with an anticorrosive agent may be performed in temperatures 12 - 35°C; the rotor should remain at ambient temperature. Coating at temperatures lower than 10°C is not allowed for the so-called dew condensation on the metal surface.
- Wrap in paraffin paper and band the surfaces coated with anti-corrosive agent.
- Packing process is performed directly after the maintenance operations have been completed. Rotor protection can be done either by putting a 0,2 mm thick, polyethylene foil.

#### 4. TECHNICAL CHARACTERISTIC

All technical characteristics are given in document 30MKA10-GB001 – Technical-operational documentation of turbo generator TWW 227, 1-2A.

#### 5. OBLIGATIONS, LIMITS AND EXCLUSIONS

##### 5.1 SUPPLIER

The Supplier shall comply with all Bulgarian National Acts and Statutory or other applicable regulations related to the health and safety, environmental protection and Power generation/distribution sector.

If the law is broken or regulations disregarded, the Owner may exercise his right to refuse to allow the offenders to remain on Site and will not be responsible for any cost penalty arising therefrom. This right shall be rigorously enforced.

The Supplier shall display notices and keep such records as are necessary according to the above mentioned regulations.

In the event of the Supplier employing subcontractors, it must be clearly understood that it is the responsibility of the Supplier to ensure that the subcontractors understand and comply with all regulations in every respect.

Once the Site is operational it will operate under the Owner's "Permit for Work" system. Written permission shall be required from the Owner prior to the Supplier gaining entry into operational areas of the Site to carry out any work under the Contract.

In order to evaluate properly the entire activity a joint inspection will be done before issuing the order. During the inspection will be clarified all the doubts, in terms of quantities, times, environmental, safety and whatever is necessary for giving to Supplier full details.

##### 5.1.1 Scope of Supplier's activities

The following activities have to be considered in scope of Supplier:

- De-conservation and conservation of the spare rotor after performed activities/tests. The rotor must be conserved for further safe storing (retrieved and renewed previous conservation conditions acc. Producer procedures). These activities include materials for rotor conservation.
- To deliver all required testing equipment and to execute tests and inspections on the spare rotor according to the attached table 1 with own measurement equipment. In order to ensure the site and rotor's safety, prior to the test execution, Supplier should submit the related procedures for preview by the Owner.
- Issue and submit reports and protocols for each Supplier's supervision and testing/inspection activity.

	<b>MARITZA III POWER PLANT</b>		Документ по. Document no. <b>90MKA10-PB401</b>	
	<b>TECHNICAL SPECIFICATION</b>		REV. 00	18.12.19
	Техническа спецификация		Страница Sheet	5 от of 7

- All mobilization, daily allowances, transportation and accommodation costs must be included.

	<b>Spare Rotor Tests and Measurements</b>
1	Visual Inspection
2	Measurement of Insulation Resistance
3	Measurement of Winding Resistance
4	Measurement of Impedance
5	RSO
6	Pole Voltage Drop Test

**Table 1. Scope of the Spare rotor's tests to be executed by the Supplier**

#### **5.1.2 Working time**

Working time will be on shift (normally work week will be 5 days, 8 hour), according program.

Consequently, the Supplier is authorized to work in shifts since the beginning, also continuously and including not normal working days (Saturday, Sunday, national holidays, etc), in order to respect the schedule.

In case of modification of starting data, the Supplier will be informed adequately; the modification of starting data is not giving rights to Supplier for claiming any additional cost.

#### **5.1.3 Schedule**

Before starting the Supplier will provide, in conjunction with the other contractor, a schedule where it will be detailed the entire activities. A weekly meeting will be held between the parties in order to monitor the progress and to solve critical items that are limiting the executions.

The Supplier will cooperate with Owner for the optimization of generator maintenance schedule in order to minimize the generator outage. The Customer will inform Supplier at least 14 days before the planned date for the start of the project.

#### **5.1.4 Cleaning**

It is required the Supplier to keep clean daily its own place of work, if place is not given by Owner, to see chapter 5.2 Owner.

#### **5.1.5 Site facilities**

The Supplier shall provide portable Site accommodation for his own and sub-contractors staff, if required, in addition to Owner provided facilities.

The Owner operates a Site security system. All staff employed at Site will be issued with Security passes by the Owner to permit access to and from the Site. It shall be the Supplier's senior representatives responsibility to ensure that security rules are complied with. The Supplier shall ensure that at least one person amongst the Site staff during Site working hours is trained in first aid and a first aid facility with all the basic needs shall be maintained.

	<b>MARITZA III POWER PLANT</b>		Документ по. Document no. <b>90MKA10-PB401</b>
	<b>TECHNICAL SPECIFICATION</b> Техническа спецификация		REV. 00    18.12.19 Страница    6    от Sheet        of    7

#### **5.1.6 Catering**

No catering facilities for the Supplier are provided on the Site. The Supplier shall provide all his own catering requirements.

#### **5.1.7 Site electricity supplies**

Owner will provide only power outlet near the site. All extension cables and sub distribution boards if needed, are in the scope of the Supplier.

#### **5.1.8 Compressed air supply**

Not applicable.

#### **5.1.9 Consumables**

All consumables and materials required for proper execution of the Supplier's site works should be considered and delivered as a part of Supplier's scope.

#### **5.1.10 Safety**

The work must be carried out in accordance with Bulgarian National and local Site Health and Safety Regulations, which govern the general duties of those involved in work as employers, Subcontractors, employees and those who control premises where work is to be carried out; and protects those involved in the work and others who may be affected.

There are hazards associated with the Site or the Owner's occupation or use of it. Some will be present at all times: others may be intermittent or may not exist until work has been carried out by the Supplier or others or operational plant has been commissioned.

Before commencing work at any point, the location of the nearest telephone which can be used in an emergency should be noted, and each man should know how to use it to summon assistance.

Before commencing work, Owner representative will inform the Supplier about:

- Specific working environmental risks.
- Specific risks from interface with other possible works in same area

In the area there are other suppliers working contemporaneously and to coordination meeting with suppliers will be held on for minimizing risks.

The safety representative of specialized company will take the responsibility to coordinate mentioned meetings.

Therefore, a continuous dialog and connection must be between safety representatives. Breach of safety will be not tolerated.

The Supplier has to obtain the work permit, according to Owner procedure, before commencing any work.

The Supplier has to submit before commencing any activity at site a Method Statement document, where is described the work organization, tools used, safety precautions adopted for preventing any injury and what ever is necessary for giving to Owner Safety Manager full view in terms of safety and to Owner Operation Manager full view of the system to include in work permit.

Weekly safety coordination meeting will be held by Owner Safety Manager, the presence of supplier's safety representative is required.

##### **5.1.10.1 Equipments**

Before starting work all the appropriate safety equipment and the first-aid kit should be assembled and checked as being in working order.



	<b>MARITZA III POWER PLANT</b>		Документ по. Document no. <b>90MKA10-PB401</b>	
	<b>TECHNICAL SPECIFICATION</b>		REV. 00	18.12.19
	Техническа спецификация		Страница Sheet	7 от of 7

The Supplier shall provide all safety equipment for use on the Works. Where such equipment is subject to statutory inspections, the Supplier shall be provided with copies of the inspection reports.

Safety clothing and equipment as helmets, eye protection, air dust mask protection, safety footwear, shall be worn at all times on the Site.

The Supplier shall comply at all times with the Owners site rules, which may include, but not be limited to, safety and operational rules.

Where sound levels cannot be reduced at source, the provision of suitable ear protection is required when noise levels indicate a level of more than 85 dB (A). When ear protection is used, arrangements should be made to ensure the wearers can be warned of other hazards.

## 5.2 OWNER

During the execution of the scope, Owner, if available, will provide an empty office space (room) to Supplier. In case of not availability of such office space (room), the Supplier will provide independently as per item 5.1.5.

## 6. TESTS

The Supplier should issue and submit reports and protocols for each done by him supervision and testing/inspection activity described in 5.1.1 Scope of Supplier's activities.

## 7. WARRANTY

The Supplier shall grant 12-months of guarantee on rotor conservation counting from the date of the undersigned final protocol.

## 8. DOCUMENT OF REFERENCE

- 30MKA10-GB001 – Technical-operational documentation of turbo generator TWW 227, 1-2A.
- 90MKA00-GB401-0 – Instruction for conservation, packing and storing of synchronous generator rotor.
- 90MKA00-GG001-1 – Maintenance instruction for turbo generator TWW 227, 1-2A.
- EMG-1 Generator Maintenance

## 9. ATTACHMENTS

None.

