

				Technical Specification			
				Document No. 90HTA00-PB401		Page: 1 By: 22	
Project CONTOURGLOBAL MARITSA EAST 3 AD TPP				Code			
Description Delivery of spare parts and Service maintenance for gas analyzing stations MCA04, Ultramat/Oxymat 6, Ultramat6, dust concentration measuring device PFM97 and system DURAG, installed in FGD in CONTOURGLOBAL MARITSA EAST 3 AD TPP							
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1. SCOPE OF WORKS

Delivery of spare parts and Service maintenance for gas analyzing stations MCA04, Ultramat/Oxymat 6, Ultramat6, dust concentration measuring device PFM97 and system DURAG, installed in FGD

2. GENERAL CHARACTERISTICS OF THE POWER STATION

The general design and operating parameters of the power station are as follows:

ContourGlobal Maritsa East 3 TPP is situated at approximately 60 km to the south east of Stara Zagora city, 10 km the the south east of the town of Galabovo and 2 km to the North of the village of Mednikarovo, Haskovo District, near Troyanovo Open pit.

Reference values of ambient parameters:

- Atmospheric pressure 1004.5 hPa
- Ambient air temperature (max): 45°C
- Ambient air temperature (min): -28.5°C
- Nominal relative humidity: 73%
- Maximal relative humidity: 100%
- Minimal relative humidity: 14%

3. DETAILED DESCRIPTION OF THE WORKS

Service maintenance for gas analyzing stations MCA04, Ultramat/Oxymat 6, Ultramat 6, dust concentration measuring device PFM97 and system DURAG, installed in FGD is carried out once a year. The contract for service maintenance signed between the Owner and the Contractor will be with duration of 2 (two) years.

• Works

- Check and replacement of consumables, defective parts and units, calibration and integral serviceability and correct operation check of gas analyzer MCA04.
- Check and replacement of consumables, defective parts and units, calibration and integral serviceability and correct operation check of gas analyzer *Ultramat/Oxymat 6*.

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- Check and replacement of consumables, defective parts and units, calibration and integral serviceability and correct operation check of NO,CO, gas analyzer Ultramat 6
- Check and replacement of consumables, defective parts and units, calibration and integral serviceability and correct operation check of dust measuring device PFM97.
- Check on serviceability of information system DURAG functions - analog and digital input-output, software – complete check.

3.1. Dust concentration measuring device PFM 97 ED (2pcs.), outlet FGD - 12/34HTA11CQ006

- 3.1.1. Visual inspection on the measuring system, fixing air and gas leaks.
- 3.1.2. Check on the measurement of the differential pressure in service mode of operation.
- 3.1.3. Calibration in Zero and Reference point
- 3.1.4. Check on the zero point with switched off blowdown (only at blowdown regime)
- 3.1.5. Check on reliability of the values of F and Fd
- 3.1.6. Check on the temperature of the measuring cell and the diluting air
- 3.1.7. Check on the suction opening of the air blower.
- 3.1.8. Cleaning the ejector
- 3.1.9. Check on the filter for ventilation of the samples and replacement, if necessary
- 3.1.10. Check on the filter for ventilation of the samples and replacement, if necessary
- 3.1.11. Overall cleaning of the instrument.
- 3.1.12. Inspection of the operation of the instrument (check and analysis on the chronological order for errors and entries in DCS).
- 3.1.13. Overall cleaning of the lance.
- 3.1.14. Cleaning with special brushes (ramrod), internally, together with the piping of the lance (sampling point, flexible sampling pipes, taps and so on)
- 3.1.15. Cleaning the measuring cell
- 3.1.16. Replacement of all bolts and fittings for the sampling head

3.2 Gas analyzer FGD inlet(4pcs.) - 12/34HTA11CQ001 Ultramat 6 - SO2/Oxymat 6 - O2

- 3.2.1. Calibration at Zero and end point.
- 3.2.2. Replacement of measuring cell filter.
- 3.2.3. Replacement and cleaning of the route of the sample of gas.
- 3.2.4. General check of the electrical connections and filters on the panel.

Sampling probe SP 210

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3.2.5. Check on the thermostat and the temperature controller for SP210-H operation

- 3.2.6. Check on the instrument functioning.
- 3.2.7. Check and, if necessary, replacement of the filter component SP-2K.
- 3.2.8. Replacement of fittings Viton (30)
- 3.2.9. Replacement of the fittings of the cover SP-210-H.
- 3.2.10. Replacement O-ring Viton.
- 3.2.11. Set of O-rings for SP210-H - replacement.
- 3.2.12. Replacement of the flange fittings DN66 PN6.

Electric Gas Cooler EC

- 3.2.13. Check on the functioning of the device (3-way valves, cooling, regime)
- 3.2.14. Washing the piping.
- 3.2.15. Checks for leaks or blockages in the system.
- 3.2.16. Check on the state of peristaltic pumps and if necessary - replacement of the worn out parts
- 3.2.17. Check on the level and the operation of the Humidifier FP-BF
- 3.2.18. Check on the membrane pump and replacement of the worn out parts (diaphragms, valves)
- 3.2.19. Replacement of the flexible tube of the peristaltic pumps.

3.3 Gas analyzer MCA04 (4pcs.) - SO₂, NO, CO, CO₂, H₂O - 12/34HNE10CQ001

- 3.3.1. Cleaning and replacement of the filters in the panels.
- 3.3.2. Blowdown, flushing of the piping route of the sample of gas.
- 3.3.3. Check and cleaning of the standard gases piping system.
- 3.3.4. Replacement of the sampling lance filter.
- 3.3.5. Replacement of the sealings of the sampling lance
- 3.3.6. General check on the electrical connections.
- 3.3.7. Calibration of the instrument with standard gases (zero point, linearity, scale and so on) and issuing a protocol.
- 3.3.8. Checking energy level of the measuring lasers and issuing a statement.
- 3.3.9. Check on the system tightness.
- 3.3.10. Check for corrosion of the parts exposed to gases.
- 3.3.11. Replacement of the sampling pump diaphragm.
- 3.3.12. Replacement of measuring cell filter.
- 3.3.13. Replacement of the inlet elbow of the measuring cell.
- 3.3.14. Replacement of non-return valve, filter component, sealings of the cell.
- 3.3.15. Check on alarms and events history and analysis on them.
- 3.3.16. Replacement of the PLC battery

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3.4 Gas analyser Ultramat 6 (2pcs.) –NO,CO inlet FGD 12 and 34

- 3.4.1. Calibration at Zero and end point.
- 3.4.2. Replacement of measuring cell filter.
- 3.4.3. Replacement and cleaning of the route of the sample of gas.
- 3.4.4. General check of the electrical connections and filters on the gas analyzer.

3.5 DURAG - 00HNE10GH001 system

- 3.1.5. Diagnostic efficiency of the input and output modules, power supply and software.
- 3.2.5. Check on the electrical components and connections of DURAG panel.

Supply

1. Offering a price list and catalog numbers for purchase requisitions of functional units, equipment, spare parts and consumables.
2. Providing all required /installed/ functional units, equipment, spares, consumables for timely replacement when necessary, against additional payment.
3. Providing consultant services in case of problems.
4. One time delivery of spare parts as per the BoQ - Item 7.

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4. TECHNICAL CHARACTERISTICS

1. Dust concentration measuring device PFM 97 ED, outlet FGD - 12/34HTA11CQ006
2. Gas analyzer FGD inlet - 12/34HTA11CQ001
 - Ultramat 6 - SO₂/Oxymat 6 - O₂
 - Sampling probe SP 210
 - Electric Gas Cooler EC
3. Gas analyzer Ultramat 6 –NO inlet FGD 12 and 34 – 12/34
4. Gas analyzer MCA04 - SO₂, NO, CO, CO₂, H₂O - 12/34
5. DURAG system - 00HNE10GH001.

5. OBLIGATIONS, LIMITATIONS AND EXCEPTIONS

5.1 CONTRACTOR

The contractor shall conform to Bulgarian legal framework or other Ordinances.

In case of breach of the law or failure to comply with regulations, the Owner reserves the right to refuse access to site, without responsibility for losses arising from that. This right shall be strictly applied.

The contractor shall present and maintain the required documentation, in accordance with the above Regulations.

In case Subcontractors are hired for execution of the works by the Contractor, it shall be quite clear that it is an obligation of the Contractor to ensure their awareness and conformity with the legal framework in each respect.

After putting the facility in operation, the access to it is given as per the Owner's Permit to work system. The contractor's access to the operational area for execution of the works, assigned under the contract, is granted with a written permission by the Owner.

Prior to assigning the Public tender, the Contractor carries out a joint inspection with the Owner to familiarize itself with the site and the scope of the activities to be executed. During the inspection, all unclear points referring to the quantities, time for execution and issues referring to environment protection and occupational health and safety as well as everything else required for detailed introduction of the contractor to the works shall be clarified.

The Contractor shall be held responsible and sanctions and fines may be imposed for any damages caused, poor assembly works and non-fulfillment of obligations. ContourGlobal Maritsa East 3 TPP is entitled to compensation for non- performance under the contractual terms.

5.1.1 Activities

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The Contractor's scope of activities include the following:

- All activities described in section 3 of this Specification;
- Submitting a full set of quality documentation for the supplied facilities or the executed works.
- On completion of all activities, the Contractor shall carry out a test on the system.

5.1.2 Working hours

The activities shall be executed during the working week with working hours 7.30-16.00. With view of keeping the work schedule, the Contractor can work at extended working hours as well as out of it (On Saturdays and Sundays) and for this shall take into consideration its activities with the regulations in force in the power station.

The contractor shall be timely informed should there be a change in the date for commencement of the works. Any change in the date for commencement, does not entitle the Contractor to claims for payment of additional expenses. Works outside the fixed working hours shall be allowed after fulfillment of the additional requirements of the Owner addressing access to site.

5.1.3 Work Schedule:

Prior to the start of the works, the Contractor shall present a working schedule, describing in detail all activities.

5.1.4 Cleaning

During the execution of the works, the Contractor shall maintain the site clean and tidy, all waste materials shall be timely removed, including any discarded and obsolete equipment, generated by the Contractor, in accordance with the requirements and to Owner's satisfaction. On completion of the works the site shall be handed over clean and tidy, to the satisfaction of the Owner.

All vehicles used for transportation of waste, generated as a result of execution of the works by the Contractor, shall be suitable for their purpose and shall conform to the local regulations. All waste shall be disposed by the Contractor to places, agreed with the Owner in advance.

The Contractor shall have in mind that the metal scrap is property of the Owner and the Contractor is responsible for the immediate removal and transportation to the disposal places on TPP site, decided for this purpose. Waste, containing metal and such without metal shall be collected separately.

The Contractor is responsible for disposal and transportation of each other type of waste to areas, nominated by the Owner within the boundaries of the Power station.

5.1.5 Facilities on site

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The Contractor shall provide accommodation facilities for its staff and for the employees of its subcontractors, as appropriate, in addition to those provided by the Owner.

A security system has been introduced in the power station. Access cards for all the personnel, working on site shall be issued by the Owner for entry and leaving the power station site. Conformity to the applicable safety rules in the power station is an obligation of the Management Representatives of the Contractor. The Contractor shall provide not less than one person from its on-site personnel, trained to provide first medical aid. All basic means for providing medical help during the working hours of the site shall be provided by the Contractor.

5.1.6 Catering

There are no catering facilities provided on site. If such are required for the personnel, the Contractor shall provide them at its own expense.

5.1.7 Power supply for the site

The power supply provided on site is with the following parameters: 220/380 V 50Hz.

The Contractor shall arrange the following steps for providing the power supply required for execution of the activities under the Contract. The Contractor requests the power, necessary for each panel which will be used, while the Owner specify the connection point which may provide the requested power supply. Laying the cables and their connection is an obligation of the Contractor.

The supply of the required electrical equipment /panels and power supply cables/ shall be at the expense of the Contractor and it will take into consideration the requirements for safe work on site.

1. All used panels shall be provided with RCD /Residual current device/ and EU-type power sockets.
2. The used extension cords and sockets shall be standard /provided with a certificate by the manufacturer.
3. The cables supplying power to the panels shall be rope type and shall be laid in the existing cable channels.

Temporary interruption in such power supply does not lead to changes in the scope of the works. Any interrupted power supply is switched on again only and exceptionally by the Owner's operating personnel.

If not otherwise instructed by the Owner, the contractor shall fulfill the following requirements:

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1. All manual light shall be foreseen for work at voltage of 25 V; safety precautions shall be taken all 25 V systems or apparatuses not to be supplied with power by systems with higher voltage than that.
2. The use of portable electrical tools or lighting equipment with voltage above 110 V is allowed only if provided with suitable earthing /residual current protection/.
3. No electrical heaters or open heating surfaces shall be used on site.

As soon as a part or a whole electrical chain is no longer necessary for the Contractor for execution of works under the contract, is shall be disconnected and removed to satisfaction of the Owner's requirements.

No open flames, matchboxes or cigarette lighters shall be used on site.

5.1.8 Compressed air supply

If necessary, the Contractor shall provide a Compressed air supply system of its own.

5.1.9 Bringing in or out of site of stocks and materials

Bringing in or out of site of stocks and materials, spares, aggregates, instruments, property of external companies in contractual obligations with the Power station shall be carried out with the form "List of stocks and materials brought in or out of TPP site" – stocks and materials, spares, aggregates, instruments, property of external companies in contractual obligations with the Power station. Such list is prepared in 2 copies, one for each of the respective checkpoints (they are kept in a separate folder) and one for the company which enters the property.

5.1.10 Safety

Works shall be carried out in conformity with Bulgarian regulations for occupational health and safety, as well as with those in force on site, which regulate the general obligations of all participants in the working processes in their capacity of employers, subcontractors and those bearing responsibility for the premises, where the works shall be carried out.

There are risks, connected to the site as well as to the nature of the works carried out. Some of them are constant and others - periodical or can exist until the Contractor or Subcontractors carry out their works, as well as when the project is under commissioning.

Prior to the beginning of the works, the location of the nearest telephone shall be clarified. Such telephone can be used in case of emergency. Each employee shall know how to use it to seek help.

Prior to the beginning of the works, a representative of the Owner (ContourGlobal) shall inform the Contractor about the following:

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- Specific risks, connected to environment protection.
- Risks, associated with other activities, executed in the same area.

The Contractor's occupational health and safety responsible on site shall coordinate his/her activities with CGOB H&S responsible, so that the risks which might occur during the execution of the works shall be timely evaluated and eliminated.

To achieve this, a constant uninterrupted communication and interconnection between the Occupational Health and Safety representatives is required. No breach of safety rules shall be tolerated.

Prior to whatever work, the Contractor shall obtain Permit to Work, as per the Owner procedure.

The Contractor shall present a Method Statement, describing the organization of the works, the used equipment, the safety measures for prevention of injuries and everything else, required for detailed information of the Safety manager, as well as operation manager, by the side of the Owner, in order to issue a permit to work for operation.

Weekly safety coordination meetings shall be conducted by the Owner's OH&S manager; they shall be attended by the Contractor's safety representative.

5.1.10.1 PPE Personal Protective Equipment

Before the start of the works, the safety equipment and the First Aid means shall be checked for serviceability.

The contractor shall provide all PPE required for execution of the works. When this equipment is subject to obligatory inspections, the Contractor shall have copies from reports for executed inspection.

When there is a risk from drowning, the Contractor has to provide safety ropes and the personnel shall carry the required PPE such as safety harnesses and ropes and to provide rescue personnel during the execution of the works.

The safety clothing and PPE such as hard hats, eye protection, dust masks, safety footwear have to be worn all the time on site.

The contractor shall always conform to the safety rules, endorsed by the Owner, which include, but are not limited to, those connected to safety and operation.

When the high levels of noise cannot be reduced at its source, it is necessary to wear hearing protection - i.e. at noise levels exceeding 85 dB(A). When hearing protection is used, it should be possible to warn the respective personnel about the presence of other hazards.

5.1.10.2 General safety rules for use of manual tools

The workers at height put their tools in special bags or boxes, to prevent their fall.

The portable electrical instruments shall be suitable for the type of the executed activity, in a good state of repair and arranged in sets in accordance with the operating instruction of their

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manufacturer, used in a correct way by persons knowledgeable about the type of the executed activity. They shall be used only for their purpose and maintained in a good state of repair.

The manufacturing class of the manual electrical tools and equipment as well as the potable electrical light and the potable transformers shall conform to the environment of their purpose. Operation with manual electrical instruments, portable lights and transformers, which do not meet the requirements for the respective working environment, shall never be used in an environment with high risk of electricity injury, fire and explosion hazard.

It is strictly forbidden:

- to work with substandard or faulty electrical instruments, portable electrical lights and electrical transformers, as well as with equipment which have not been periodically checked;
- the use of defective or substandard plug and socket joints and extensions.

The manual electrical tools, portable electrical lights or portable transformers shall be entrusted to persons of the personnel, who are held responsible for their storage.

The persons, who work with electrical instruments, portable lights and transformers with protection class I against electricity damage, (by means of neutral earthing, protective tripping or protective earthing), shall be in possession of 1st qualification group under "Regulation on health and safety during work in electrical switchgear of electrical and heat power station and electrical networks.

Depending on the characteristics of the working environment, associated with electricity injuries, rated voltage of the used potable lights shall be not higher than:

- for environment of normal level of hazard - 42 V;
- for environment with raised and special hazard, including outside the premises - 24 V;
- in metal tanks, boilers, tunnels, wells and others - 12 V.

The use of protectively insulated portable lights (from class II) for rated voltage of 220 V in an environment with raised or special level of hazard is admissible, if the length of the power supply cable does not exceed 10 m.

Depending on the characteristics of the working environment, associated with electricity injuries, rated voltage of the used electrical equipment and portable transformers shall be not higher than:

- for environment with normal level of hazard - 220 V for one phase and 380 V for three phase;
- for environment with raised and special hazard, including outside the premises - 42 V;
- in metal tanks, boilers, tunnels, wells and others - 24 V.

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Operation with manual electrical equipment with 1st class of protection against injuries from electrical current with rated voltage not higher than 380 V in premises with raised and special hazards and outside the premises is admissible, when protective tripping or protective segregation is used.

The rated voltage for electrical equipment and portable transformers of protection class II against electricity injuries (protectively isolated) can be 220 V for one phase and 380 V for three phase ones, no matter what the characteristics of the environment might be.

Before the beginning of the works in fire hazardous environment with manual electrical tools or portable transformers, the organization of the works shall be agreed with the Regional Fire safety and protection of population service, with their written permission - welding works act.

The length of the power supply cable for manual electrical equipment is restricted to 6 m. Length of up to 30 m is admissible should protective tripping be used. The length of outgoing cables of transformers for protective separation and safe extra low voltage shall not exceed 30 m.

During work with manual and portable equipment, lights and transformers, no impacts shall be permitted on their power supply cables, such as: extensive squeezing, folding, stretching, touching heated surfaces, subjecting to the action of chemical substances and admixtures - acids, basis, oils, gasoline and others

Operation with manual electrical instruments, portable lights or portable transformers in fire explosive environment is forbidden if they are not with the respective explosion-proof execution.

Work outside the premises with portable and manual electrical equipment when it is raining or snowing shall be forbidden, unless it is supplied with power of up to 12V. Such equipment shall not be used in case of active atmospheric activity /lightning /.

On completion of the work or in case of interruption of the power supply, the instrument is switched off the power supply network.

If a defect is found during operation, which could create danger for electric current injury, the work shall be interrupted immediately, the power supply is disconnected and the line manager shall be immediately informed. The electric tool is repaired or discarded and measures for prevention of its use are implemented. Such measures shall be in force until conformity of the equipment is restored.

5.1.10.3 General safety rules during installation and dismantling of scaffolding

Installation and dismantling scaffolding is required in order to guarantee access for maintenance and insulation and /or refractory work and all kinds of maintenance activities on the equipment. All scaffoldings shall be constructed in accordance with the existing standards (BDS EN 1004, BDS EN 12810-1 и 2, BDS EN 12811-1, BDS EN 12812 and BDS EN 1298) by experienced and certified workers in the presence of a specialist (responsible person) who shall be fully aware of the occupational health and safety requirements for work on a scaffolding and its use. All materials used into the production shall be tested and marked in accordance with the standard. Each

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constructed scaffolding shall be accompanied with a conformity document, containing the technical parameters for admissible load, validity period until the next check and others. The scaffoldings can be constructed from various types of components (facade scaffoldings (frame ones) pipes and RACs, modular types of scaffoldings). Here it shall be mentioned that the various types of scaffolding shall not be combined with one another in horizontal projection at one level (apart from the reinforcement). It shall be noted that the scaffolding is a very important part of the facilities' maintenance and its construction and dismantling shall happen in very short periods and under conditions which fully cover the Owners requirements for safe work and use. For detail description of installation, authorization, use and dismantling of scaffoldings, please refer to document 00\$\$\$00-GB404-1.

Table with loading classes of pipe and RAC scaffoldings									
1	2	3	4	5	6	7	8	9	10
Classes	Designation	Durability	Usage	U.D.L. /Uniformly distributed load on platform /kN/m ²	Maximum number of platforms in use	Maximal bay length	Maximum spacing board transoms	Maximum number of boards	Width class
1	2	3	4	5	6	7	8	9	10
1	1-3-0	Very light duty	Inspection, painting, cleaning	0.75	One full /0,75/ and one /0,35/	2,7 m	1200 mm	3	W06
2	2-4-0	Light duty	Plastering, glazing, putting signs	1.50	One full /1,50/ and one /0,75/	2,4 m	1200 mm	4	W09
3	3-5-0 3-4-1 3-4-2 3-5-1 3-5-2	General purpose	General Construction work	2,00 inside boards 0.75	One full /2,00/ and one /1,00/	2,1 m	1200 mm	5 4+1 4+2 5+1 5+2	W09 W09 W12 W12 W12

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	3-4-1S							4+1	W09
	3-4-2S							4+2	W12
	3-5-1S							5+1	W12
	3-5-2S							5+2	W12
4	4-5-0	Heavy Duty	Heavy Masonry work	3,00 inside boards 0.75	One full /3,00/ and one /1,5/	1,8 m	900 mm	5	W09
	4-4-1							4+1	W09
	4-4-2							4+2	W12
	4-5-1							5+1	W12
	4-5-2							5+2	W12

5.1.10.4 General rules for providing fire and emergency safety during execution of hot works

Prior to performing hot work for hot works, Hot Work Permit shall be obtained. Conclusion about the possibility to carry out hot works is stated in the protocol. The external contractors designate a responsible who:

- Ensures the area is cleaned from inflammable materials within a diameter of 5 meters, and from easily combustible and explosion hazardous materials - within 20 m;
- provides protection of the inflammable objects, which cannot be removed with suitable non-combustible partitions;
- Provided all the necessary means for fire extinguishing at the place of work;
- Prevents sparks and molten metal falling on combustible materials;
- On completion of the works, switches off the power supply for the welding equipment or stops the supply of the welding gases;
- Organizes collecting and putting away of the equipment;
- Informs the person who issues the Hot works Permit and the Permit to work about the completion of the works.
- In case of a fire immediately discontinues works, informs the local Fire department and organizes fire extinguishing activities with the available means.

The welding works can start only after the supervisor, together with a representative of the local Fire safety and protection of the population unit have exercised control on the execution of the foreseen measures for providing fire safety. On Fire safety and protection of the population unit representative evaluation, readiness of the unit for cooperation for emergencies shall be provided.

Only qualified personnel shall be given access to carry out hot works. The persons, engaged in execution of hot works and their supervisors shall go through periodical fire safety induction.

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Before each execution of hot works, the persons to perform them shall be given periodical safety induction.

Such inductions shall be performed by the supervisor for the welding and other hot works of the contractor with participation of a representative of the Fire safety and emergency safety Unit.

During the execution of hot works in fire hazardous or explosion hazard places, the person, issuing the Hot works permit informs the Regional Fire safety and protection of population organization and can require providing fire watch with a fire engine. During the execution of hot works on sites, the works shall be executed with strict adherence to specific obligatory requirements which are established depending on the type of the executed work, in accordance with the norms.

5.1.10.5 General safety rules during electric arc welding and gas welding and cutting

Works involving electric arc welding and gas welding and cutting shall be performed only by authorized personnel in possession of the required qualification.

Electrical welders shall have not less than II-nd qualification group as per Regulation on health and safety at work in electrical installation of electrical heat stations and electrical networks.

Only equipment in good working condition shall be used. When defects are found the works are immediately terminated and the line manager shall be informed.

When performance of electric arc welding and gas welding and cutting activities are planned at places without ventilation or which are not open sites, in fire hazardous area, in accordance with the classification made for the premises in the power station as well as on the constant places of work, which have been established with an Order by the Owner, to the issued Permit to work is attached a Hot Works Permit which is registered in a journal, in accordance with the appendices to Ordinance I-209 and this instruction. A fire extinguisher shall be provided at all the places of work where hot works are carried out.

It is forbidden to carry out welding works on metal by workers with clothes polluted with solvents or with fuel - greasing materials, or saturated with oxygen clothes, shoes, gloves and others. The same is in force for the assisting personnel who stay in immediate proximity to the places for performance of welding works.

In addition to PPE, standard for work in the power station, the welders shall use suitable PPE for welders (apron, sleeve protectors, leggings or protective suit), made by flame resistant materials.

The following protective measures shall be taken during repairs on vessels with easily combustible materials: preliminary washing the vessels with hot water or steam, ammonia and others. Welding is carried out only after drying and airing.

Welding works shall not be carried out in proximity to easily inflammable materials and liquids (less than 10 m). The place of work shall be well lit.

During works, carried out at height or at several levels, measures shall be taken to prevent falling of sparks or molten metal on people or combustible materials, situated under the place of welding or cutting or fire blankets shall be used.

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Fall protection (harnesses) shall be used by welders or their assistants when works are carried out at a height of above 1,5 m.

During works at confined spaces the requirements of OI_2_04_016 "Work in confined spaces" shall also be met.

During work with gas cylinders the requirements of OI_2_04_022 "Work with gas cylinders" are met.

5.1.10.6 General safety rules during arc welding and metal cutting activities

Prior to the start of the works, the arc welder shall prepare the place of work (collect and tidy the details or waste, which hamper the normal execution of the works, enclose the place of work with portable protective partition) and shall check the following:

- Earthing in the body of arc welding equipment and connection of the Neutral earthing wire.
- The good operational state of the insulation of the electrical conduits and the tightness of the contacts.
- the good operational state of the electrical holder and the strength of the insulation of the isolation at the places of connection of the duct into the lever.

The installation and the maintenance of the arc welding device or aggregate shall be performed only by authorized personnel in possession of required qualification.

All energized parts, especially the generator body or the transformer and start up rheostat, shall be earthed. Earthing of movable installations shall be carried out before the start of the works and shall not be removed until the works have been completed. Earthing shall be carried out with the help of copper wire, provided with brackets, providing reliable contact. The welded object shall be earthed as well.

All wires shall be well insulated and their cross section shall meet the minimum requirements (the normal currents shall be considered current at constant regime). The wires from the generator or transformer next to the panel shall be protected from mechanical damage as well; wires which lead from the apparatus to the handle of the electrode and to the bulk of the welded object shall be cables - which means polycore flexible cables with flexible armor. Cables, longer than 10 m shall not be used for connection between the electrical welding equipment and the electrical distribution boards.

Flexible wires in protective hoses shall be used for supplying electrical current to the electrode. When less flexible wires are used, they shall be connected to the electrical holder by means of a flexible armored wire of cable, not less than 3 m long.

The handle of the electrode holder shall be prepared from insulating refractory material.

The electrical generators and transformers, all auxiliary instrument and apparatuses to them, with which works are carried out in the open shall be in protected execution with protection against humidity. The facility shall be under awning from refractory material.

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Portable lamps with maximal voltage of 12 V shall be used for lighting during work. The replacement of the electrodes shall be carried out after the power supply has been disconnected, the used electrodes butts are collected and removed from the places of work and on completion of the works.

Before putting and tightening the electrode to the holder, it shall be cleaned from oxides and grease.

For execution of welding works in wet places, the arc welder shall work on a dry rubberized tarpaulin.

During works at enclosed spaces (tanks, boilers, cisterns and others) it is necessary:

- An insulation tarpaulin shall be used, which prevents the body from touching the metal surfaces;
- A helmet shall be worn, preventing the back side of the head from touching metal surfaces.

Welding aggregates and start up apparatuses shall be cleaned on daily basis on completion of the works.

The electrical welding equipment are repaired depending on the established rules and terms for maintenance.

During electrical welding in closed premises without ventilation, harmful Nitrogen oxides are released, so forced ventilation shall be provided.

Whenever the arc welder leaves temporarily the place of works, he/she shall switch off the power supply for the welding aggregate.

The arc welder shall require preliminary preparation of the edges of the welded details during execution of the welding works.

Cleaning of the slag in the places of the welding seam shall be carried out with protective goggles.

The use of protective goggles, prepared from ordinary glass and painted shall not be permitted. When electrical welding and cutting are carried out a protective shield or a mask, protecting all the face of the worker, shall be used. It is admissible when protective shield is used the protective hard hat not to be used. On completion of the welding works and immediately after the protective shield has been taken off, the employee has to put on a protective hard hat.

The assistant arc welder and the workers, working in immediate proximity to the place of execution of the welding works, shall be provided with the same protective devices as the welder (shield or face mask, goggles, hand protection and others).

It is strictly forbidden:

- To carry out maintenance or repairs on the electrical installation of no matter what nature.
- To touch the electrical wires and fuses with bare hands;
- To remove the housing and the cover of the startup bodies;

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- Switching on the breaker when there is a sign put on it: "Do not switch on!";
- Drawing bare or badly insulated wires as well as use of reinforced fuses with increased cross section which do not meet the requirements for the welding current.
- Execution of maintenance of energized arc welding transformers and aggregates;
- Work in the open in rainy weather or then there are lightnings;
- Leaving arc welding equipment energized then the works have been interrupted;
- To do arc welding when the body of the generator or of the transformer or start up rheostat, or the item which is welded are not earthed;
- To work with wire which has not been earthed;
- To work without any protective devices and goggles and with defective ones;
- To execute weldings in proximity to easily combustible and inflammable materials.
- The distance to them shall be not less than 10 m;
- To do weldings on installations and equipment under pressure;
- The worker to connect or do maintenance on the transformer and electrical installation;
- Storage and keeping gas, benzine and other combustible substances in the welding premises;
- It is strictly forbidden to do welding on cisterns and other vessels, serving to transport or storage of combustible materials without preliminary cleaning, rinsing, drying and airing.

5.1.10.7 General safety rules during gas welding and cutting activities

The main components for the equipment of gas welding are the following:

- Gas cylinders with oxygen and combustible gas (propane or acetylene);
- Pressure reducing valves, installed next to the stopping valve of the gas cylinder;
- Pressure gauges;
- flashback arrestor, protecting the gas cylinder from explosion;
- Flexible hoses, leading the gases to the burner;
- Non-return valves, installed on the burner, which prevent leaking combustible gas into the oxygen line and back;
- The burner in which the combustible gas is mixed with oxygen and is kindled.

Prior to the start of the works, the worker shall do some preparatory works by checking the good operational state of all components and to prepare the place of work (to collect and tidy the details and the waste, which obstruct the normal execution of the works). Commencement of the work shall not be allowed when some of the components is missing or is defective. Welding aggregates shall be cleaned on daily basis on completion of the works.

The hoses shall be arranged at a distance of the place of work in order to prevent contact with the flame, a spark, high temperature or heated surface, to prevent the fire.

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The following protective measures shall be taken during repairs on vessels or wrappings from various easily combustible materials: preliminary washing the vessels with hot water or steam, ammonia and others. Welding is carried out only after drying and airing.

During execution of gas - flame welding and cutting, protective goggles shall be used by the welders and his/her assistants (when there is danger of welder's flash in the eyes).

It is strictly forbidden:

- To work with not well sealed hoses, valves or other part of the equipment or missing non - return valves of the burner and pressure reducing valve;
- Work with damaged pressure reduced valve or broken glass on the pressure gauges;
- Work on the oxygen part of the welding equipment with oily hands or tools;
- Work without the PPE required for this purpose.
- The working gas cylinder and the oxygen cylinder shall not be put in immediate proximity. There shall be not less than 5 meters between them;
- When the work is stopped, the burner shall never be left working;
- The welded piece shall never be held by hand ;
- The use of protective goggles, manufactured from ordinary glass and painted shall not be permitted.
- It is strictly forbidden to do welding on cisterns and other vessels, used for transportation or storage of combustible materials without preliminary cleaning, rinsing, drying and airing.

The places of work are equipped with equipment, facilities and means for extinguishing fires. The type and the quantities of the tools, facilities and means for firefighting shall be determined on the basis of the applicable fire safety norms, while their arranging and designation is carried out in conformity with the standards in force.

When the works require closing certain sections from the on-site roads in the power station, which prevents the passage of the specialized vehicles, this is agreed in advance with Local fire safety and protection of population service and the medical service.

The types and the means for fire extinguishing which shall be provided are declared.

5.1.10.8 Safety measures, safety signs and signals.

For rendering the working site safe, permanent or temporary partitions shall be used (railings, covers, nets, screens and other), which shall be used at shafts, staircases, balconies, platforms, bridges, airborne lines, pedestrian passageways, sticking out parts and parts with sharp edges and ends , moving machines and facilities, blanks for materials, sprinkling or spilling liquids, air borne particles, metal and wooden shavings and others.

The passage ways, access and entries for the platform, which are within the hazardous areas of the working equipment shall be rendered safe at not less than 1,0 m of their dimensions with stable and resistant covers (safety floors, awnings and others, in accordance with the specific conditions.

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The openings in the building and construction components (walls, floor slabs, roofs and others, which create danger of falling from height:

- shall be rendered safe by means of railing or strong cover, which shall bear the respective load;
- shall be designated and/or signaled in a suitable way.

For the temporary places of work, the type and the quantity of signs, signals and enclosures is determined by the person, issuing the Permit to work. On completion of the work at the temporary place of work and closing the permit to work, all temporary signs, tables and enclosures shall be removed.

5.2 OWNER

5.2.1 OBLIGATIONS, LIMITATIONS AND EXCEPTIONS

❖ Power supply for facilities on site or works

The Owner shall allow the Contractor to use electrical power and water. In case of interruption of the power supply due to some reason, the Contractor is not allowed to raise claims for additional costs; the Contractor shall provide for themselves autonomous power supply sources should any be necessary.

❖ Contractor 's village

The Owner shall provide to the Contractor area in proximity to the power station, where the office containers /vans/ can be arranged, so as to be used as offices or storage.

❖ Special tools

The Owner shall provide to the Contractor the possibility to use elevators to lift up workers and materials. In case of interruption of the power supply due to some reason, the Contractor is not allowed to raise claims for additional costs; the Contractor shall provide for themselves autonomous power supply sources should any be necessary.

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6. REFERENCE DOCUMENTATION

- **00&&&00-GB404-1** Procedure on construction and control on scaffolding.
- **OI_2_04_016** „Work in confined spaces”
- **OI_2_04_022** „Work with gas cylinders”
- **00&&&00-QK401** “Procedure on welding, thermal processing and NDT control on welding connection of pipelines”
- Regulation on health and safety at work in electrical switchgear and heat power station and in the electrical networks.
- Regulations for safe work on the non-electrical equipment of TPP and heat plant and in heat transmission networks and hydraulic facilities.
- Ordinance №9 / 09.06.2004 on technical operation of electrical power stations and networks.
- Processes of ContourGlobal Maritsa East 3 about the following.
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Access system - Health, Safety and Security department

Occupational health and safety - Health, Safety and Security department

Environment - environment department

The Contractors shall familiarize themselves with the above procedures prior to commencement of the works in ContourGlobal Maritsa East 3, in the respective departments.