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| Action: | The Upgrade of the Iron Gate I Navigational Lock |
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| Date: | *12.09.2018* |

**CORRIGENDUM NO 2 TO TD**

**The following alterations are made to the Tender Dossier**

**(alterations in bold italics)**

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 2, 5.5.1.2., pg 234** |

**The former text**

Measurement of water levels upstream and downstream of the Navigation lock and measurement of water levels in navigation lock chambers ensure safe operation of the Navigation lock. The shock pressure of water on the gates can be prevented if gates are moved only when water levels on both sides of the gate are approximately equalised, with the defined tolerance of 3 cm.

The technical solution of water level metering system shall envisage the following main equipment:

* Pneumatic water level measurement systems (hereinafter also referred to as pneumatic meters);
* Hydrostatic probes for water level measurement;
* Water level measurement systems with float, counterweight, chain and encoder (hereinafter also referred to as float meters);
* Water temperature measuring probe;
* Connection boxes;
* Required installation material;
* Measuring and power supply cables.

Each of the above-mentioned systems/probes for water level measurement shall be installed in the existing water measurement shafts for the following measurements:

* Upstream water level of the Danube;
* Water level in the upstream chamber;
* Water level in the downstream chamber;
* Downstream water level of the Danube.

Signals from the systems (the meters) and probes shall be connected to the corresponding redundant PLCs i.e. to redundant distributed I/O units of the electro-hydraulic drives at the upper, middle and lower head.

Water temperature shall be measured upstream in the Danube and signal from the probe shall be introduced in the PLC of auxiliary systems of the upper head.

All measurement signals shall be introduced in the PLCs i.e. the distributed I/O units through galvanic isolation devices or signal multiplicators with galvanic isolation.

Water level systems and probes shall be supplied with the voltage of 24 VDC from the corresponding control system power supply cubicles in the engine rooms of the corresponding head (+1UC1/+2UC1).

The existing water level measuring equipment consists of mechanical gauges - selsyn transducers and hydrostatic probes. The existing selsyn transducers and existing hydrostatic probes shall be put out of operation i.e. completely dismantled and handed over to the Employer.

**The new text**

Measurement of water levels upstream and downstream of the Navigation lock and measurement of water levels in navigation lock chambers ensure safe operation of the Navigation lock. The shock pressure of water on the gates can be prevented if gates are moved only when water levels on both sides of the gate are approximately equalised, with the defined tolerance of 3 cm.

The technical solution of water level metering system shall envisage the following main equipment:

* Hydrostatic probes for water level measurement;
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* Water temperature measuring probe;
* Connection boxes;
* Required installation material;
* Measuring and power supply cables.

Each of the above-mentioned systems/probes for water level measurement shall be installed in the existing water measurement shafts for the following measurements:

* Upstream water level of the Danube;
* Water level in the upstream chamber;
* Water level in the downstream chamber;
* Downstream water level of the Danube.

Signals from the systems (the meters) and probes shall be connected to the corresponding redundant PLCs i.e. to redundant distributed I/O units of the electro-hydraulic drives at the upper, middle and lower head.

Water temperature shall be measured upstream in the Danube and signal from the probe shall be introduced in the PLC of auxiliary systems of the upper head.

All measurement signals shall be introduced in the PLCs i.e. the distributed I/O units through galvanic isolation devices or signal multiplicators with galvanic isolation.

Water level systems and probes shall be supplied with the voltage of 24 VDC from the corresponding control system power supply cubicles in the engine rooms of the corresponding head (+1UC1/+2UC1).

The existing water level measuring equipment consists of mechanical gauges - selsyn transducers and hydrostatic probes. The existing selsyn transducers and existing hydrostatic probes shall be put out of operation i.e. completely dismantled and handed over to the Employer.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 2, 5.5.2.3., pg 236** |

**The former text**

The Contractor shall supply at least the following equipment:

* Upstream Danube:
	+ One (1) pneumatic meter;
	+ One (1) hydrostatic probe;
	+ One (1) float meter;
	+ One (1) water temperature probe;
	+ Connection boxes;
	+ Required installation material;
	+ Instrumentation and power supply cables;
* Upstream chamber:
	+ One (1) pneumatic meter;
	+ One (1) hydrostatic probe;
	+ One (1) float meter;
	+ Connection boxes;
	+ Required installation material;
	+ Instrumentation and power supply cables;
* Downstream chamber:
	+ One (1) pneumatic meter;
	+ One (1) hydrostatic probe;
	+ One (1) float meter;
	+ Connection boxes;
	+ Required installation material;
	+ Instrumentation and power supply cables;
* Downstream Danube:
	+ One (1) pneumatic meter;
	+ One (1) hydrostatic probe;
	+ One (1) float meter;
	+ Connection boxes;
	+ Required installation material;
	+ Instrumentation and power supply cables.

**The new text**

The Contractor shall supply at least the following equipment:

* Upstream Danube:
	+ Two (2) hydrostatic probe;
	+ One (1) float meter;
	+ One (1) water temperature probe;
	+ Connection boxes;
	+ Required installation material;
	+ Instrumentation and power supply cables;
* Upstream chamber:
	+ Two (2) hydrostatic probe;
	+ One (1) float meter;
	+ Connection boxes;
	+ Required installation material;
	+ Instrumentation and power supply cables;
* Downstream chamber:
	+ Two (2) hydrostatic probe;
	+ One (1) float meter;
	+ Connection boxes;
	+ Required installation material;
	+ Instrumentation and power supply cables;
* Downstream Danube:
	+ Two (2) hydrostatic probe;
	+ One (1) float meter;
	+ Connection boxes;
	+ Required installation material;
	+ Instrumentation and power supply cables.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 2, 5.5.2.4.1., pg 236** |

**The former text**

Mandatory spare parts shall be delivered together with the water level measurement system and shall correspond to the supplied equipment. The Contractor shall include in its scope of delivery the following mandatory spare parts:

* One (1) pneumatic meter;
* One (1) hydrostatic probe;
* One (1) float meter;
* One (1) water temperature probe;

Mandatory spare parts shall be listed in Volume 4 and shall be included in the Contract Price.

In case of termination of production of the mandatory spare parts, the Contractor shall:

* Inform the Employer in advance of the forthcoming cessation of production so that the Employer has sufficient time to provide the necessary spare parts;
* Deliver with no fees, and at the request of the Employer, detailed plans, designs, drawings and specifications of spare parts.

**The new text**

Mandatory spare parts shall be delivered together with the water level measurement system and shall correspond to the supplied equipment. The Contractor shall include in its scope of delivery the following mandatory spare parts:

* One (1) hydrostatic probe;
* One (1) float meter;
* One (1) water temperature probe;

Mandatory spare parts shall be listed in Volume 4 and shall be included in the Contract Price.

In case of termination of production of the mandatory spare parts, the Contractor shall:

* Inform the Employer in advance of the forthcoming cessation of production so that the Employer has sufficient time to provide the necessary spare parts;
* Deliver with no fees, and at the request of the Employer, detailed plans, designs, drawings and specifications of spare parts.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 2, 5.5.5.3., pg 242** |

**The former text**

Pneumatic water level meters shall be envisaged for measurements of surface water and shall have at least the following characteristics:

* Equipped with bubble chamber;
* Setting of measurement intervals;
* Resolution: 1 mm;
* Accuracy: ±5 mm;
* Power supply: 10 - 30 V DC (24 V DC);
* Output signal: 4 to 20 mA;
* Operation temperature: -20°C to +60°C;
* Relative humidity: 10 – 95%;
* Cleaning function: Yes;
* Output connection: capillary cable of adequate length.

Pneumatic meters shall use air from the existing low-pressure air system installation of 8 bar within the Navigation lock. The Contractor is obliged to make and install the installation for delivering of low-pressure air from the closest connection to the existing low pressure installation of 8 bar up to water level measuring shafts. Reduction valves for the regulation of air pressure, air flow regulators, oil separators, as well as other necessary equipment for the air installation shall be installed in water level measuring shafts.

**The new text**

*The text is deleted in total, with no insertions to follow.*

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 2, 5.5.5.5., pg 243** |

**The former text**

Float meter encoders shall have the following characteristics:

* Absolute encoder;
* Number of rotations ensuring measurement accuracy of ±5 mm;
* Operation temperature range: -20ºC to 60ºC without heating;
* Supply voltage: 19 - 30 V DC;
* Output signal: 4 to 20 mA.

**The new text**

Float meter encoders shall have the following characteristics:

* Absolute encoder;
* Number of rotations ensuring measurement accuracy of ±5 mm;
* Operation temperature range: -20ºC to 60ºC without heating;
* Supply voltage: 19 - 30 V DC;

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 2, 5.5.6.2., pg 244** |

**The former text**

The required water level differences, which shall be calculated by the redundant PLCs of electro-hydraulic drives at the upper, middle and lower head shall be as follows:

* Upstream Danube water level – upstream chamber level;
* Upstream chamber level – downstream chamber level;
* Downstream chamber water level – downstream Danube water level.

A separate digital output on the corresponding redundant PLC i.e. redundant distributed I/O unit (the total of two redundant contacts for each water level difference) shall be used for each above-mentioned water level difference. If the water level difference exceeds 3 cm, output contacts shall be open (fail-safe).

Movement of service gates shall be blocked if water levels on the both sides of the service gate have not been equalised.

The upper head maintenance gate can be closed without fulfilling the condition of equalised water levels.

The values of each envisaged measuring and the above water level differences shall be presented on local operator stations, as well as on SCADA system operator stations.

Float meters, pneumatic meters and hydrostatic probes shall operate in triple redundancy i.e. in the system 2 of 3. Signals of all three measurements in redundant configuration at the each envisaged measuring point shall be introduces in both redundant distributed I/O units.

**The new text**

The required water level differences, which shall be calculated by the redundant PLCs of electro-hydraulic drives at the upper, middle and lower head shall be as follows:

* Upstream Danube water level – upstream chamber level;
* Upstream chamber level – downstream chamber level;
* Downstream chamber water level – downstream Danube water level.

A separate digital output on the corresponding redundant PLC i.e. redundant distributed I/O unit (the total of two redundant contacts for each water level difference) shall be used for each above-mentioned water level difference. If the water level difference exceeds 3 cm, output contacts shall be open (fail-safe).

Movement of service gates shall be blocked if water levels on the both sides of the service gate have not been equalised.

The upper head maintenance gate can be closed without fulfilling the condition of equalised water levels.

The values of each envisaged measuring and the above water level differences shall be presented on local operator stations, as well as on SCADA system operator stations.

Float meters and hydrostatic probes shall operate in triple redundancy i.e. in the system 2 of 3. Signals of all three measurements in redundant configuration at each envisaged measuring point shall be introduces in both redundant distributed I/O units.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 2, 5.10.6.1., pg 315** |

**The former text**

The measuring sensor shall fulfil the following requirements:

* Measurement range: 0.1 µSv/h…..10 Sv/h
* Sensitivity to 137 Cs: 4 cps / mSV.h-1
* Operating temperature: -30….+500C
* Mechanical protection degree: ≥IP 57

Maximum distance between radiation detection probe and data processing unit shall amount to 1000 m or more. The communication interface shall be RS-485.

**The new text**

The measuring sensor shall fulfil the following requirements:

* Measurement range: 0.8µSv/h - 1000µSv/h
* Sensitivity to 137 Cs: min 8 cps/ µSV.h-1
* Operating temperature: -30….+500C
* Mechanical protection degree: ≥IP 57

Maximum distance between radiation probe and data processing unit shall amount to 120 m or more.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 2, 5.10.6.2., pg 315** |

**The former text**

Data processing unit shall provide at least the following:

* Setting of 3 threshold values for each sensor;
* Monitoring of the status of each sensor;
* Overview of degrees and thresholds that exceed the records;
* Serial communication with sensors, alarm units.

The value of natural radiation level and adequate value of exposure dose intensity amounting to 2pC/kg·s (28µR/h) on the average imply that the alarm radiation level at the measuring point could be 3-4 pC/kg·s. Since ship and barge passage below the mitre gate of the middle head lasts at least 23 s, measurement result can certainly manifest as alarm for the above exposure intensities, given interval and conditions of measurement.

**The new text**

Data processing unit shall provide at least the following:

* Setting of 3 threshold values for each sensor;
* Monitoring of the status of each sensor;
* Overview of degrees and thresholds that exceed the records;

The value of natural radiation level and adequate value of exposure dose intensity amounting to 2pC/kg·s (28µR/h) on the average imply that the alarm radiation level at the measuring point could be 3-4pC/kg·s. Since ship and barge passage below the mitre gate of the middle head lasts at least 23s, measurement result can certainly manifest as alarm for the above exposure intensities, given interval and conditions of measurement.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 4, 9.1.6.9.2., pg 45** |

**The former text**

Contractor shall deliver the following mandarory spare parts:

* For air handling units:
* Airflow pressure switches;
* Anti-vibration mounts;
* Belts and pulleys;
* Damper actuators;
* Door fasteners,
* Fans;
* Filters;
* Flexible connections;
* Motors;
* Sensors.
* For radiators:
* Cast iron radiator tools;
* Radiator valve tails, thermostatic heads and O-rings;
* Bleed valves and drain cocks;
* Reducing bushes and plugs;
* Joing nipples, gaskets and sealants.
* For fan-coil units:
* Compressor;
* Motor;
* Blower wheel and fan disk;
* Air filter;
* Condensate Drain Pan;
* Pressure Switch;
* Flow Switch;
* Time Delay Relay;
* Expansion Valve;
* Bearing Set (Ball/Rubber/Bracket).

**The new text**

At least the following equipment shall be supplied as mandatory spare parts for new HVAC equipment:

* 5% of the total quantity, but not less than 1 (one) piece or set of each type of the:

For air handling units:

* Airflow pressure switches;
* Damper actuators;
* Filters;
* Flexible connections.

For radiators:

* Radiator valve tails, thermostatic heads and O-rings;
* Bleed valves and drain cocks;
* Reducing bushes and plugs;
* Joing nipples, gaskets and sealants.

For fan-coil units:

* Compressor;
* Motor;
* Blower wheel and fan disk;
* Air filter;
* Condensate Drain Pan;
* Pressure Switch;
* Flow Switch;
* Time Delay Relay;
* Expansion Valve;
* Bearing Set (Ball/Rubber/Bracket).

Mandatory spare parts shall be included in the Contract price.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 4, 9.2.6.6.2., pg 62** |

**The former text**

At least the following equipment shall be supplied as mandatory spare parts for new HVAC equipment:

* 5% of the total quantity, but not less than 1 (one) piece of each type of the following equipment:
* Miniature circuit breakers;
* Load-break switches;
* Contactors;
* Control switches and pushbuttons;
* Relays (protective and auxiliary);
* Sensors;
* Instruments;
* Signalling lamp with holders;
* Fan electromotors.

Mandatory spare parts shall be included in the Contract price.

**The new text**

At least the following equipment shall be supplied as mandatory spare parts for new HVAC equipment:

* 5% of the total quantity, but not less than 1 (one) piece of each type of the following equipment:
* Miniature circuit breakers;
* Load-break switches;
* Contactors;
* Control switches and pushbuttons;
* Relays (protective and auxiliary);
* Sensors;
* Signalling lamp with holders.

Mandatory spare parts shall be included in the Contract price.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 4, 10.1.1.3.1., pg 70** |

**The former text**

The Upgrade of Stable Fire Fighting shall include complete replacement of the existing stable fire fighting system with the new one. The new stable fire fighting system shall have the same concept and the main characteristics as the existing one. The layout of the new system shall be the same as the existing one. The new equipment shall be of the modern desing.

The Upgrade shall include complete replacement of:

* the existing equipment of the mixing system in the engine room.
* the pipeline distribution system inside and outside the engine room, including pipeline supports, hangers etc,
* FF monitors with supports, platforms and related ladders.

The upgrade of the engine room roof with an opening for the purpose of providing adequate conditions for access and maintenance of equipment is also planned and is subject of the civil engineering works within this tender.

**The new text**

The Upgrade of Stable Fire Fighting shall include complete replacement of the existing stable fire fighting system with the new one. The new stable fire fighting system shall have the same concept and the main characteristics as the existing one. The layout of the new system shall be the same as the existing one. The new equipment shall be of the modern desing.

The Upgrade shall include complete replacement of:

* the existing equipment of the mixing system in the engine room.
* the pipeline distribution system inside and outside the engine room, including pipeline supports, hangers etc,
* FF monitors.

The upgrade of the engine room roof with an opening for the purpose of providing adequate conditions for access and maintenance of equipment is also planned and is subject of the civil engineering works within this tender.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 4, 10.1.1.3.5., pg 75** |

**The former text**

All existing firefighting monitors shall be replaced with new ones, with the same main characteristics. In addition to the exiting ones, the new firefighting monitors shall be of the self-moving ( self-oscilating ) type. The firefighting monitors shall have possibility for local manual control by an operator.

The monitors shall be equipped with the new new supports, carriers and access platforms with ladders.

**The new text**

All existing firefighting monitors shall be replaced with new ones, with the same main characteristics.

For existing monitors supports, carriers and access platforms with ladders the following works shall be required: sandblasting of complete steel structure, visual inspection, repairing or replacing any damaged parts and new corrosion protection.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 4, 10.1.2.3.3., pg 77** |

**The former text**

* 48 Foam monitors with automatic self –oscillation ( self-motion ), with foam capacity 1900 l/min, intake pressure 9,5 bara, range up to 44m, with necessary equipment, steel stands and climbers.

**The new text**

* 48 foam monitors with self-moving (self – oscillation), with foam capacity 1900 l/min, intake pressure 9.5 bara, range up to 44m.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 4, 10.1.2.4.2., pg 78** |

**The former text**

Contractor shall deliver the following mandarory spare parts:

Extract Pumps

2 maintenance sets for 5 years operation recommended by the pump manufacturer

Firefighting Monitors

1 spare motor for FF Monitor including self oscilation mechanism

1 manometer for the inlet of FF monitor

48 sets og gaskets for 5 years operation recommended by the monitor manufacturer

**The new text**

Contractor shall deliver the following mandatory spare parts:

Extract Pumps

2 maintenance sets recommended by the pump manufacturer

Firefighting Monitors

6 manometer for the inlet of FF monitor

6 sets og gaskets recommended by the monitor manufacturer

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 4, 14.5.3. pg 247** |

**The former text**

Lighting shall be designed to provide visual performance, safety and economical usage of power.

Visual performance shall be free of excessive stroboscopic effects and flicker from discharge type lighting.

In the rooms, where visual display units are to be installed, the design shall take account of the need to avoid operator fatigue.

LED luminaries shall be used for functional lighting.

The Contractor shall establish the parameters for the lighting design and ensure that the latest definition of maintenance factor is applied in the Calculations. This includes for taking into account all losses associated with the luminaries including lamp lumen maintenance, switching and lighting operation.

The Contractor shall assume that the luminaries will be cleaned once a year.

The design adopted shall ensure satisfactory operation over the life of the Navigation lock.

The lighting design shall take full account of the drop-off in performance of lamps and luminaries over their expected working life and shall indicate required maintenance to maintain minimum lighting levels.

On each of the 3 navigation lock heads, chambers and fore-docks, the equipment of the following characteristics shall be installed:

* Rated voltage of functional lighting: 230 V; 50 Hz
* Rated voltage of emergency lighting: 220 V DC;
* Minimum luminance level in the open:
* Hydraulic plants in the open 10 lx
* Bridges across navigation locks, passages 3 lx
* Navigation locks fore-dock area 30 lx
* Navigation locks (headwater level),

 main landing places, bollards 50 lx

* Navigation locks chamber (tailwater level) 30 lx
* Minimum luminance level in rooms:
* Room of the main, central or block

 control panel, space limited by main

 panels, control points of

 hydropower junctions 200 lx

* Control panel room without permanent

 staff on duty, rooms with panels for relays

 and low voltage panels 100 lx

* Various pumping stations,

 rooms for control of various devices 75 lx

* Riparian fire water pumping station 75 lx
* Basement of the machine hall, mechanisms,

 pumps, electric motors, etc. 75 lx

* Galleries in the submerged part of the structure

 and in the dam with equipment, distribution cabinets,

 measuring apparatus, etc. 50 lx

* Galleries in the submerged part of the structure

 and dams without equipment,

 floodgates and other shafts of navigation locks 5 lx

Continuous regulation of the light in the captain's room on the tower must exist in order for the captain to choose the level of illumination depending on the weather conditions.

The position of luminaires, poles and other equipment must be selected so as to enable regular and hazardless maintenance, free of interruptions in the operation of electric power facilities.

Attention shall be paid to the height between the ceiling and the portal crane. It is very small on the middle head.

All lamps and floodlights (spotlights) intended for outdoor and indoor lighting of the navigation lock structure of „Đerdap 1“ shall meet the requirements from the standard IEC 60598.

Indoor emergency lighting system shall be designed for 10% of normal lighting system illumination levels.

Indoor emergency lighting (anti-panic) system shall be designed for illumination levels of 5 lux in the exit door area and 1 lux in other facilities.

The Contractor shall submit to the Employer for approval the necessary calculations justifying the illumination levels for indoor and outdoor lighting.

**The new text**

Lighting shall be designed to provide visual performance, safety and economical usage of power.

Visual performance shall be free of excessive stroboscopic effects and flicker from discharge type lighting.

In the rooms, where visual display units are to be installed, the design shall take account of the need to avoid operator fatigue.

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The Contractor shall establish the parameters for the lighting design and ensure that the latest definition of maintenance factor is applied in the Calculations. This includes for taking into account all losses associated with the luminaries including lamp lumen maintenance, switching and lighting operation.

The Contractor shall assume that the luminaries will be cleaned once a year.

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* Rated voltage of emergency lighting: 220 V DC;
* Minimum luminance level in the open:
* Hydraulic plants in the open 10 lx
* Bridges across navigation locks, passages 3 lx
* Navigation locks fore-dock area 7 lx
* Navigation locks (headwater level),

 main landing places, bollards 10 lx

* Navigation locks chamber (tailwater level) 10 lx
* Minimum luminance level in rooms:
* Room of the main, central or block

 control panel, space limited by main

 panels, control points of

 hydropower junctions 200 lx

* Control panel room without permanent

 staff on duty, rooms with panels for relays

 and low voltage panels 100 lx

* Various pumping stations,

 rooms for control of various devices 75 lx

* Riparian fire water pumping station 75 lx
* Basement of the machine hall, mechanisms,

 pumps, electric motors, etc. 75 lx

* Galleries in the submerged part of the structure

 and in the dam with equipment, distribution cabinets,

 measuring apparatus, etc. 50 lx

* Galleries in the submerged part of the structure

 and dams without equipment,

 floodgates and other shafts of navigation locks 5 lx

Continuous regulation of the light in the captain's room on the tower must exist in order for the captain to choose the level of illumination depending on the weather conditions.

The position of luminaires, poles and other equipment must be selected so as to enable regular and hazardless maintenance, free of interruptions in the operation of electric power facilities.

Attention shall be paid to the height between the ceiling and the portal crane. It is very small on the middle head.

All lamps and floodlights (spotlights) intended for outdoor and indoor lighting of the navigation lock structure of „Đerdap 1“ shall meet the requirements from the standard IEC 60598.

Indoor emergency lighting system shall be designed for 10% of normal lighting system illumination levels.

Indoor emergency lighting (anti-panic) system shall be designed for illumination levels of 5 lux in the exit door area and 1 lux in other facilities.

The Contractor shall submit to the Employer for approval the necessary calculations justifying the illumination levels for indoor and outdoor lighting.

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| **Volume 3-Part 3-PARTICULAR EMPLOYERS REQUIREMENTS****Section 4, 14.6.5. pg 251** |

**The former text**

Lighting poles of appropriate height (10m) and type shall be provided for outdoor lighting system. The poles shall be of hot-dip galvanised steel of round or circular shape and designed to withstand the forces from the wind with velocity.

Poles shall be base hinged and mid hinged type. Mid hinged poles type shall be used for poles mounted on bollards in upstream fore-dock area.

The pole shall be provided with a compartment with a rainproof lockable door, containing terminals for cable connection, earthing terminal and fuse. The pole shall be embedded over (at least) 1/6 of its entire length, into a sufficient concrete foundation which shall have opening for bringing in the cables. The diameter of all parts of the pole shall be designed for the stresses-which may occur during operation.

All poles and lamps must be selected for the disassembly of the lamp without the use of auxiliaries or special vehicles. Disassembling lamps must be carried out by a maximum of two perpetrators.

**The new text**

Lighting poles of appropriate height (10m) and type shall be provided for outdoor lighting system. The poles shall be of hot-dip galvanised steel of round or circular shape and designed to withstand the forces from the wind with velocity.

Poles shall be fixed, base hinged and mid hinged type. Mid hinged poles type shall be used for the poles mounted on bollards in bank side upstream fore-dock area, all river side poles shall be base hinged and all others shall be fixed.

The pole shall be provided with a compartment with a rainproof lockable door, containing terminals for cable connection, earthing terminal and fuse. The pole shall be embedded over (at least) 1/6 of its entire length, into a sufficient concrete foundation which shall have opening for bringing in the cables. The diameter of all parts of the pole shall be designed for the stresses-which may occur during operation.

All poles and lamps must be selected for the disassembly of the lamp without the use of auxiliaries or special vehicles. Disassembling lamps must be carried out by a maximum of two perpetrators.