2. MECHANICAL PART

In the Machine-hall building main equipment is disassembled and transported by use of main crane. Additionally hoist beams with dedicated hoists have been foreseen for maintenance purposes of all mechanical devices installed in the locations without direct access of the main crane. Dedicated hoist beams are installed above the pumps, pumps motors, heavy filters and valves in the basement, 0,0m level and +4,0m level. Transportation of the devices from the installation place to the service area is realized by use of electric forklifts with platform carts, which are stored in the workshop building.

2.1. Lifting devices

Main overhauls in the Machine-hall building are realized by use of double-girder overhead crane V50SMD10AE001. For equipment without direct access of the main crane, dedicated hoist beams and hoists are foreseen. For all equipment of a weight ≥ 500kg electric hoists are foreseen, for equipment of a weight < 500kg manually operated hoists are foreseen. Electric hoists are installed on the dedicated beam, while manual hoists can be relocated and used on different hoist beams according to the needs. Dedicated electrical hoists are installed above DH pumps (V50SMD20AE001), above dirty condensate pumps (V50SMD40AE001), above DH make-up water pumps (V50SMD55AE001), above DH circulating pump for auxiliary equipment cooling (V50SMD70AE001), above glycol circulating pumps (V50SMD75AE001), above main condensate pumps (V50SMD80AE001), above main condensate pumps motors (V50SMD85AE001), below the main crane beam (V50SMD96AE001). For valves and filters of a glycol system located near glycol circulating pumps one hoist (V50SMD35AE001) is foreseen. For equipment maintenance of a weight < 500kg following manually operated hoists are used: V50SMD25AE001, V50SMD45AE001, V50SMD50AE001, V50SMD89AE001, V50SMD90AE001, V50SMD91AE001.

2.1.1. Crane Q=65T/10T V50SMD10AE001

Place of installation, maintenance galleries, access

The machine-hall building is equipped with two-hooks crane with a lifting capacity Q=65T/ 10T and span S=29m. Level of railhead is +18,66m. Main hook of crane has a possibility to rise to the level +18,73m. Working area of the crane is presented on the drawing VKJ01-1425512. Between the “G”÷“H” axes and near the “1” axis of machine-hall building, the service platform for repair of hoist of the crane is located. The platform level is +16,26m. The entrance to the platform is ensured with the ladder from level +9,00m. It is planned that a standstill area of the crane will be located near the “H” axis of building.

Crane purpose

Crane with a hook of lifting capacity Q=65T will assist during the CHP Plant main equipment (turbines, generators, heat exchangers, etc.) maintenance works during their scheduled or emergency inspections and repairs. Crane with a hook of lifting capacity Q=10T will assist during the CHP Plant main and auxiliary equipment overhaul works.

Intermediate storage areas

At the level of ±0,00m, between axes "E"=>"F" and "1"=>"5" axes of the building, the intermediate storage area size 18m x 6m is located. The useful load of the floor in the intermediate storage area is designed to be 85kN/m^2. At the level of ±0,00m also are for crane static test is foreseen. The area of size 3m x 2m with allowable load 160 kN/m^2 is located between axes "E"=>"F" close to axis "4".

At the level of +9,00m, between the "F"=>"H" and "1"=>"2" axes as well as between "C"=>"E" and "1"=>"2" axes of the building, the additional intermediate storage areas size 12m x 6m are located. Intermediate storage area is designed for useful load 40kN/m^2. Location of the storage areas is shown in drawing no. VKJ01-1425512.

Crane guarantees the vertical and horizontal transport of dismantled elements of a plant during services and other components of technological equipment into intermediate storage area or on the transporting vehicle.

Commissioning tests crane

A set of reference weights for crane static test should be placed at the level ±0,00m in a designated area on the intermediate storage area. Stack of weights should be submitted on a special support frame. It is assumed that the set of reference weights will be placed to use the crane. It is also assumed that the reference weights will be placed on the frame in two stacks.

Total weight of the lifting beam, lifting sling, reference weights and support frame must equal, at static test, 1,25 x nominal capacity of the crane hook. At the time of the static test the possibility of displacement of the bridge crane and possibility of winch movement must be blocked for safety reasons.

It is assumed that the stack of reference weights to crane dynamic test (consisting of two piles of weights with a total mass equal to 1,1 x nominal capacity of the crane hook) will be placed at the level of ±0,00m.

It is assumed that reference weights are made of metal. It is also assumed that the required sets of reference weights 75T and 66T for commissioning tests should be provided by the supplier of the crane

(or borrowed from specialist companies). Is not expected to supply CHP Plant in set the reference weights, and no provision for them storage area.

The lifting slings, support frames and lifting beams (traverse), necessary for the commissioning tests of the crane, will be designed and supplied by the manufacturer. The final design and dimensions will be defined by the crane supplier.

Maintenance work technology

The technology of conducting service works has been specified by the manufacturer in the manufacturer documentation.

Crane power supply

The crane along the runway is equipped with conductor rail - cable slide. Electrical power supply to the crane is installed along the runway beam, along the axis “1”. Electrical power supply to the crane, and the main switch is located at the intersection of the 1 and A axis, at height of ~1,2 m above the level +9,00m.

Control and lock of the crane

It is assumed pendant control of the crane. The crane must have a manual lock of the bridge and trolley hoists mechanisms driving during commissioning static tests crane.

Technical data of machine-hall crane

General data:

Pos. 16	*acc. VKJ01-102-DP-T-03.5119.SZ-02-EN*
Type	*double girder overhead*
Number of hoists	*2*
Hook lifting capacity	*Q=65/10 T*
Hook type	*rotating, the throat closed*
Span	*29m*
Hook lifting height	*21m*
Location	*machine-hall building*
Bridge travelling speed:	*40 m/min*
Trolley travelling speed:	*20/5 m/min*
Hook lifting speed:	*5/2,5 m/min*
Working group (GNP)	*A4 by ISO 4301-5*

Runway type	*bar 80x40mm*
Length of runway	*50,0m*
Length of crane driving	*41,9m*
Use crane temperature	*0°C÷+40°C*
Noise level	*<85dB(A)*
Equipment:	*the device overload protection*
Operation environment	*standard*
Crane operated levels	*±0,00m, +9,00m*
Weight	*44,0T*
Manufacturer	*BCI*

Electrical data:

Power	*82,42 kW*
Voltage	*380V*
Frequency	*50Hz*
Control	*radio control (pendant as backup)*

Operational Requirements

Crane shall be provided with overload protection, as well as limit switches operating mechanism move up and down. The crane shall be provided by the supplier with the signaling device which automatically emits warning tone.

2.1.2. Electric hoist V50SMD20AE001

The electric hoist V50SMD20AE001 is located in the machine-hall building above the pumps/motors of DH water pumps V50NDC10AP001, V50NDC20AP001, V50NDC30AP001, V50NDC40AP001. Pumps are located between axes “A” => “E” and axes “6” => “7” on the 0,0m level. The hoist lifting capacity equals Q=8T, what is sufficient for one pump or its motor transportation (weight of the pump equals 2840kg, pump motor equals 6950kg).

Level of running beam (bottom shelf) of the hoist is +6,6m. Hook of the hoist can rise to the level of +4,88m. The beam location is presented on the drawing no. VKJ01-102-DP-T-02.5119.B-02.