Research materials
For diagnostics of Poti Sea port crane machines
And vehicles.

LTD “ART.TECH.CENTRE”

2017

Research materials
for diagnostics of technical condition of Poti Sea port
gantry crane “Condore”
(C. #1291, Reg. #20659, Inv. #2FA93637)

Approved by LTD “Art.Tech.Centre”

Director N. Nareshelashvili

24 December 2017

Crane’s condition research

Certificate

The gantry crane “Condore” with capacity 16/32/40/t and registration number #20659, and invoice #2/FA93637 is located in Poti Sea port.

The regular examination of technical condition of gantry crane “Condore” was done by the commission by the following composition: director N. Nareshelashvili, defect specialists - Z. Molashvili, G. Stepniashvili, mechanic G. Chovelidze, electricians – I. Partsvania, M. Karkusashvili,

During the execution of works it was established that:

1. The gantry crane “Condore” was manufactured in 1985. Manufactorer is VEB “Kranbau Eberswalde”. Domestic #1301. It was installed in 1985 in Poti Sea port and operated since 1985.

   Boom longineth m. - 8÷32;

   Height of lifting load m. – 15.5-28.5;

   Speed of movement m/min - 20,00;

   Crane rotating frequency rpm - 1,00;

   Speed of lifting (lowering) cargo m/min - 40 (47);

   Bass and truck m - 10,5;

   Metal construction of the crane – box, steelwork.

2. The crane is used for bulk and retail cargo for work in three shift work: humidity is increased, salty sea water is an aggressive environment. The environment minimum and maximum temperature range is -40 +40 °C.

3. The metal construction investigation result is: No crucks were detected in the bearing metal constructions welded joints and in the main metal. Low quality ripped welded joints detected on the counterweight console of the main power cable of the management system (Pic.20,21).

The bullet holes are noticeable at the balancing trolley (Pic. 2-12). The snips depth is around 18-22 mm that equals to 20-40 % of the metal.

4. Displacement mechanism - break-shoes are demaged and threadbeared (Pic. 19). The mechanisms are in a good condition.

5. Rotate mechanism – in a good condition.

6. Jib lifting mechanism – in a good condition.

7. Loader mechanism – one break shoe is demaged (Pic 18). Other mechanism is in the normal condition.

8. Screws twisted connections in a good condition.

9. General deformations are not noticeable.

10. Local deformations – trolleys sheets are deformed.

11. Cranes manage systems – for reducing the dynamic forces acting on the crane and for increasing the productivity the manage crane must be exchanged with the new one – modern type of the managing system, frequiency manage.

12. The final switches in a working condition.

13. There are missed two electric engines of driving system for anti running of the crane. (Pic. 16).

14 There is no anemometer on the crane. . Electro systems for the crane managing is in the good condition.

15. The driving cabin must eschanged with a new construction that will be equipped by new manage system, protection systems and tools (block device, indicators of load capacity and jib prolongation, signal lights Pic. 26.27, voltmeter and amperometre and etc.). That's all will provide cranes work. The mindwshield that could be opened does not exist, also does not exist windshield wiper, no air conditioner, and no upper hatch, no fire estinguisher and no radion CD broadcaster. The anemometer signal can not reach in the cabin. Driving cabin's power and operate cables are amortized for the isolation is too old and does not have a flexibility, and needs exchange. There is surface corrosion over the cabins root. The surface corrosion depth not more then 0.1 mm in the locar areas.

16. Metal construction corroision – cabel pipes are corroding (Pic. 13-15) and fragments of cranes lader handrails are also corroding.

17. Quality of painting – is a normal but from visual point of view, will be better if all the construction will be painted again.

18. Other defects – lader and passage passage gallerys are not lightened. Also crane is not lightened at night time working that can give a danger during the period of driving. It is desirable to place the flickering signal at the balncing trolleys area.

Commision report

As a result of testing the gantry crane “Condore” (with capacity 16/32/40/t and registration number #20659, and invoice #2/FA93637) the commission sets out the following:

1. For reducing the dynamic forces acting on the crane and for increasing the productivity the manage crane must be exchanged with the new one – modern type of the managing system, frequiency manage.
2. The driving cabin must eschanged with a new construction that will be equipped by new manage system, protection systems and tools (block device, indicators of load capacity and jib prolongation, signal lights Pic. 26.27, voltmeter and amperometre and etc.). That’s all will provide cranes work. The crane must be equipped by mindwshield that could be opened, also by windshield wiper, air conditioner and by heating systems, by upper hatch, fire estinguisher and radion CD broadcaster. The anemometer signal must show the permissible wind speed. Driving cabins power and operate cables must be exchanged for the amortized of insulation sheaths.
3. The anemometer must be installed on the crane.
4. The electric engines must be installed on the anti running mechanisms.
5. Welded joints of the counterweight console of the main power cable of the management system must be repaired.
6. The bullet holes on the balancing trolley metal construction must be filled using electric art welding.
7. Running trolleys deformed sheets can lieve without any changes because deformations are under the permissible norms.
8. Demaged break-shoes of the loader mechanism and of the transportation mechanisms must be changed.
9. Corrod power chanells and the leader handrails fragments that are under the corrosion must be exchanged.
10. The leaders and galleries must be lightened.
11. Flickering signal must be placed in the balancing trolleys area.
12. For the visual point of view it is preferable to paint the crane completely.

Defects specialit …….Z. Molashvili

Mechanist ……..G. Chovelidze

Electric …….I. Partsvania

Defects list and measures to eliminate defects

Crane manufactor	Serial #	Redistration #	Invoice. #
Condore	1291	20339	2

№	Defects type and recommendations to eliminate defects	Price of rehabilitation works, GEL
1	2	3
1	The manage crane must be exchanged with the new one – modern type of the managing system, frequiency manage.	
1.1	Create projet documentation	920000,00
1.2	The loading mecjanism assembly electric engine 2x132 • Manage box IP 44; • Break-shoe gate IP 33; • Lifting electric engine, 132 kW; • Break system of the loading mechanism with hydro push; • Break disk 630 mm; • Coordination protection system; Cable production set.	
1.3	Rotate mechanism asssambly electric engine 2x23 • Manage box IP 44; • Break-shoe gate IP 33; • Lifting electric engine, 23 kW; • Break system of rotate mechanism with hydro push; • Coordination protection system; Cable production set.	
1.4	Assambly electric engine of jib accessibility changing 1x123 • Manage box IP 44; • Break-shoe gate IP 33; • Lifting electric engine, 30 kW; • Break system of the loading mechanism with hydro push 50 mm; • Coordination protection system; Cable production set.	
1.5	Assambley engine of cranes movement 4x5,5 • Manage box IP 44; • Break-shoe gate IP 33; • Lifting electric engine, 5,5 kW; • Break system of the loading mechanism with hydro push ТГМ 200М; • Coordination protection system; • Cable production set.	

1.6	Assembly engine of wedge-shaped holder mechanism 2x1,4 • Manage box IP 44; • Break-shoe gate IP 33; • Holder electric engine, 1.4 kW; • Cable production set.	
1.7	Control system • Cable input and protection systems box IP 44; • Cable production set.	
1.8	Calcualtion of the installation works (Working mode A6) including hourly period of testing.	127845
2.	The driving cabine must be supplied by all equipment and order that are mentioned in the section #2 of the report: a) Glass must be made with triplex or temperatured glass; frontal upper and lateral windows should be opened. Glass fixed from the inner side and for safety must be used complet triple stripes. Protect grids of the bottom glaze content two parts: upper – removable, that will be easy to clean the window, and bottom part – no removable. b) On the ceiling used 2x18 W light with capacity 220 V. c) The cabin can paint from the outside by yellow RAL 1003 color and from the inside by gray RAL 7047 color according to standards ГОСТ; d) Electric convector heating – 3 kV, 220 V, or thermo fan (2x2 kW, 220 V); e) Air conditioner with capacity 2.5 kW/220 V, that is used for oscillating constraction; f) Extinguisher; g) Cloth hanger; h) Pharmacy box with medicins; i) Glass cleaning overflow with container must be installed on the car windscreen; j) The upper windows must be covered by eye shield from the sun ray; k) Radio CD broadcast must be installed;	104710
3	The Anemometre АСЦ-3 or M-95 M must be in stalled on the crane	1500
4	Electric engines must be installed over the anti running mechanism. (2 electric engines with capacity 1 kW, rotate frequency 1500 rpm).	6040

5	The welded seam on the counterweight console of the main power cable must be repaired by permanent current electrode УОНИ- 13/55 or 13/45 (at beginning it must be cut and after that welded by electrode Э 42А ГОСТ 9466-76, must be used wire СВ-08 or Г2С ГОСТ 2246-70), After the welding the seam must be cleaned by grinder. All the procecced areas must be painted by anti corrosion paint according to the instruction И -30-2-76. The first layer must be painted by ХВ-556 or ХВ-068 (7313-75), the other layer must be painted by ХВ-124 or ЛФ -115 (ГОСТ 7313-75) .	250
6	The bullet holes on the balancing trolley metal construction must be filled using permanent electric art welding (as an instruction can be used p. 5);	500
7	The demaged break-shoes on the loading and running mechanisms must be replaced.	340
8	Corrod power chanells and the leader handrails fragments that are under the corrosion must be replaced (around 18 m)	475
9	Leaders and passage gallery must be lightened (IP class, 4 pieces);	450
10	Flickering signal must be placed in the balancing trolley area.	445
11	For the visual point of view the whole crane must be painted by anti corrosion paint. The drainage holes must be cleaned. Supperficially corroded areas must be cleaned till the metallic glitter. PF -3 must be processed by anti corrosion solution and painted by anti corrosion paint according to the instruction И -30-2-76 (The painted square is 280 m2);	20020
12	Refurbishment works tottaly including the VAT	1182445,00

Fig. 1

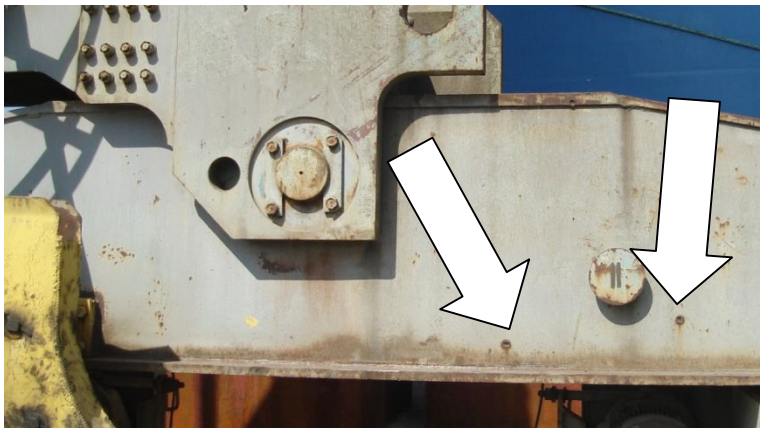

Fig. 2

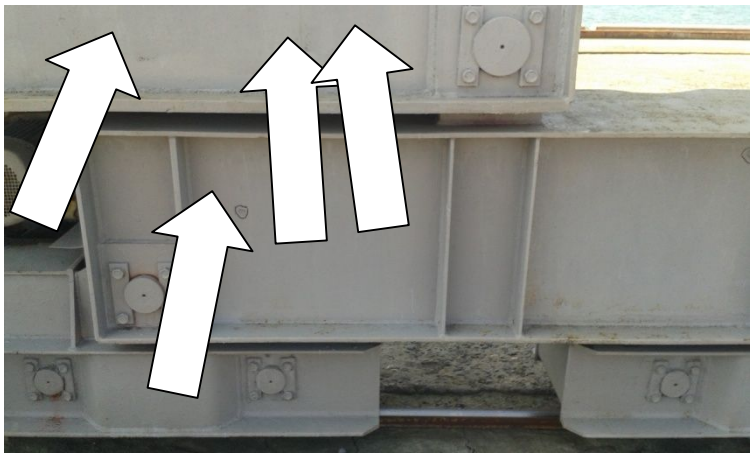

Fig.. 3

Fig.. 4

Fig. 5

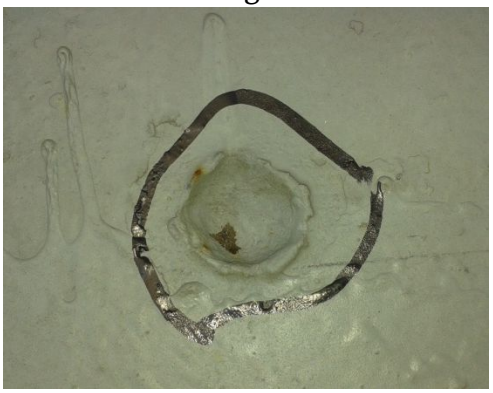

Fig.. 6

Fig.. 7

Fig. 8

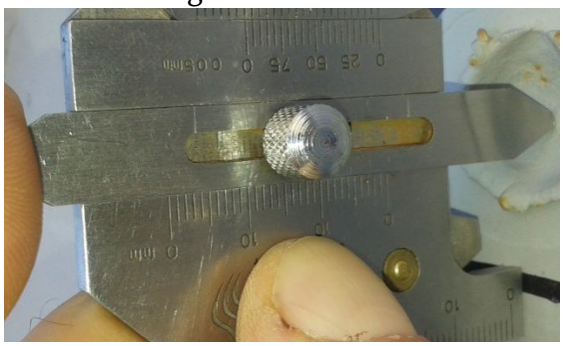

Fig.. 9

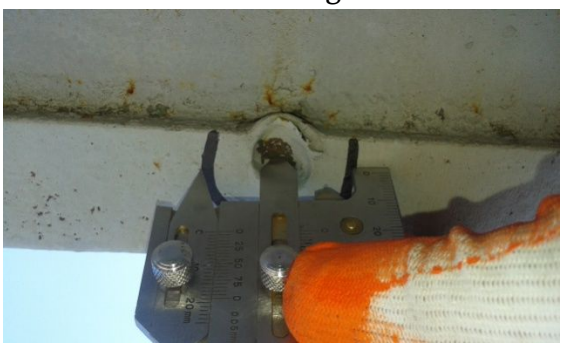

Fig.. 10

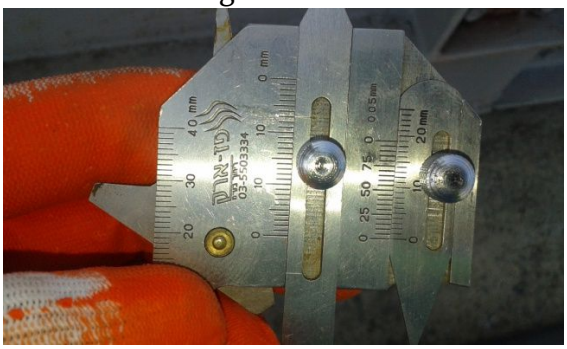

Fig. 11

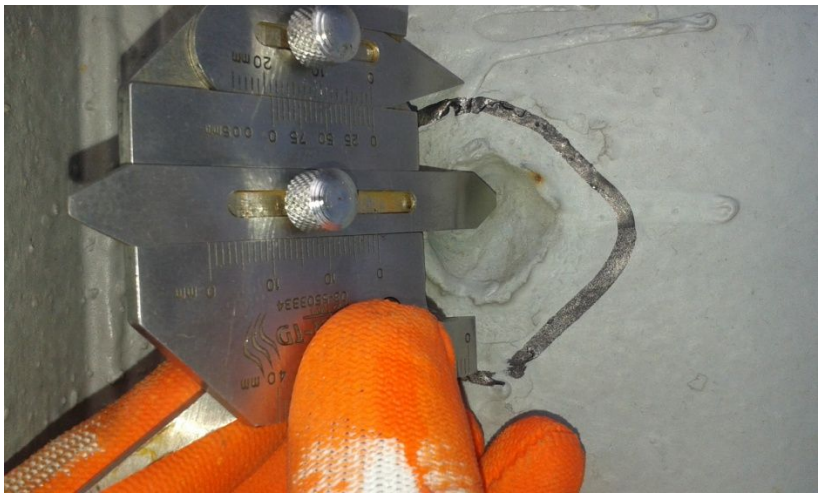

Fig.. 12

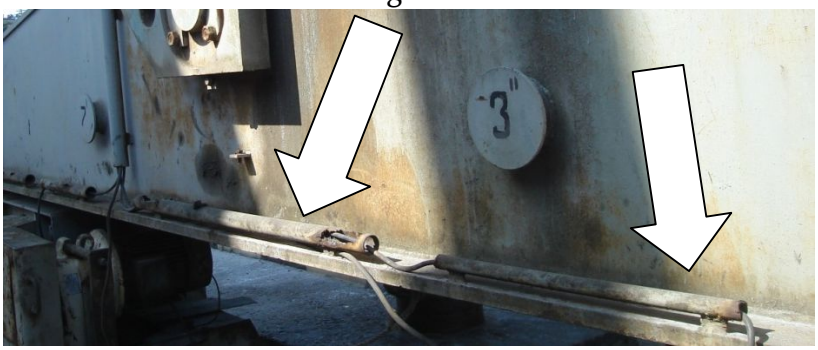

Fig.. 13

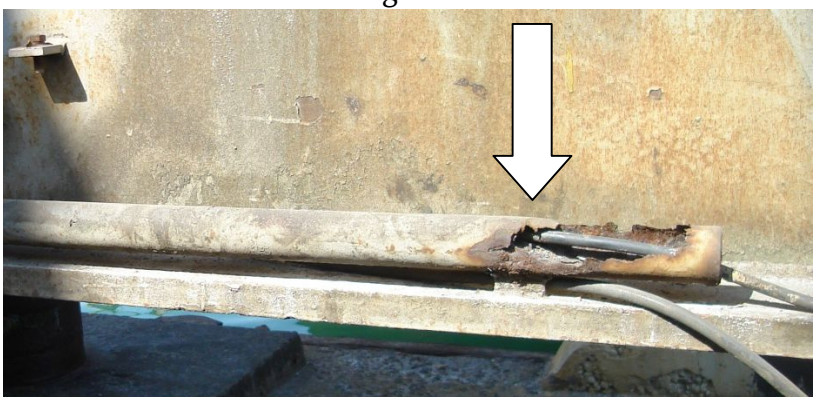

Fig.. 14

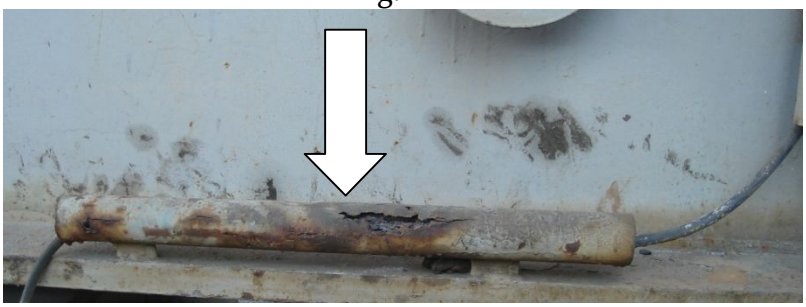

Fig.. 15

Fig. 16

Fig. 17

Fig.. 18

Fig. 19

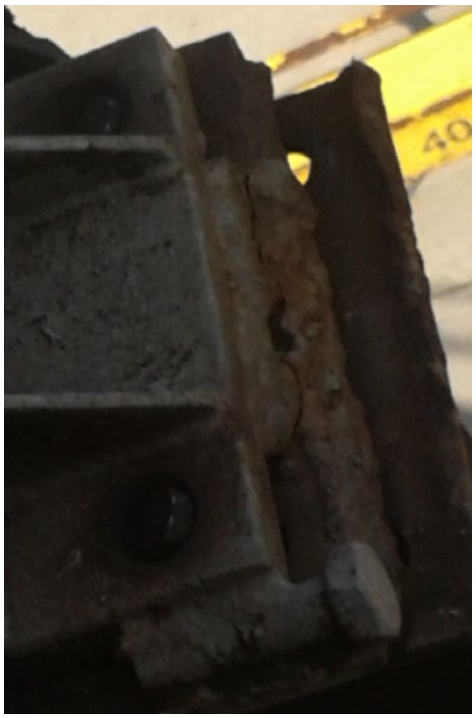

Fig. 20

Fig. 21

Fig. 22

Fig.. 23

Fig. 24

Fig.. 25

Fig.. 26

Fig. 27