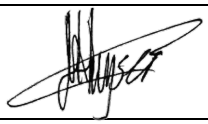
Duvha Power Station	**Unit**	2
	Genix ID	17610
	Date	2020/03/08

Outage type	MGO	**Outage start date**	2022/01/07
Department	Turbine Engineering	**System**	Main turbine Condenser
Scope review date	N/A		

Details	**System Engineer**
Name & Surname	Wichert Huyser
Signature	
Date	2022/03/08

1. DETAILED SCOPE OF WORK: MAIN TURBINE CONDENSER

1. Introduction:

During an inspection in the main turbine condenser waterboxes during the current MGO it became apparent that there are severe damage to the “B” pass inlet tubesheets. Both the cold condenser and hot conder inlet tubesheets are damaged and need urgent repairs.

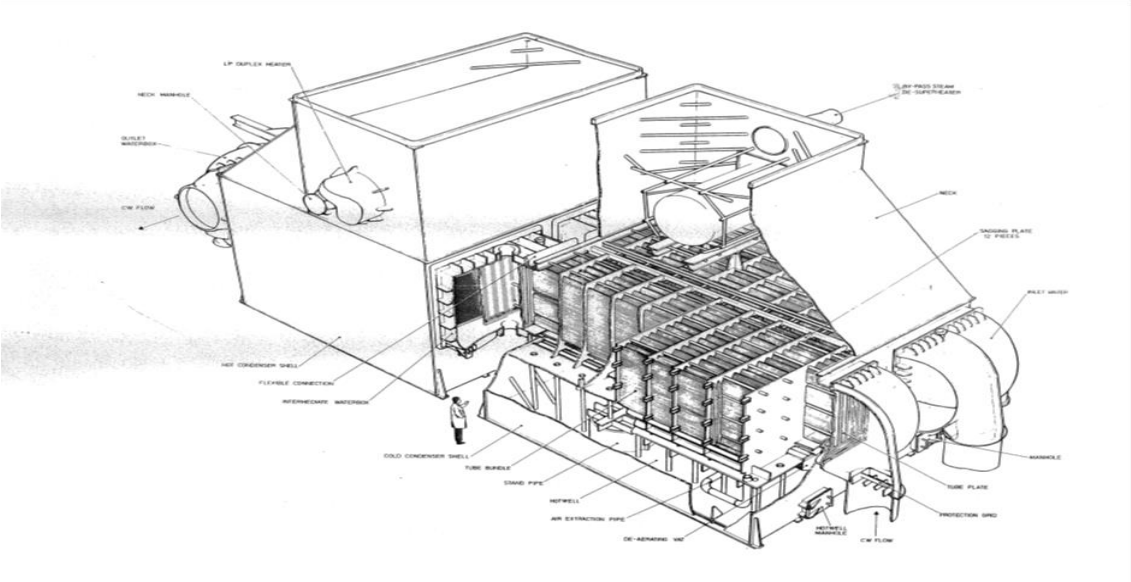


Figure 1: Layout of inlet and outlet ducts

2. Scope

2.1. “B” pass Cold condenser inlet tubesheet

From the photo it is apparent that there are mechanical damage to the tube inlets. It is possible that this damage could have been caused by a loose sacrificial anode plate that got thrown around in the waterbox.

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Figure 2: Cold condenser "B" pass inlet tubesheet

This damaged can be repair by either using a expander to slightly expand the tubes or flaring tool or a combination of the two. The final process will be discussed with the appointed contractor in the kick of meeting. It is suggested that the appointed contractor inspect the damaged tubes before quotation to ensure the extent of the damage are catered for. The *Contractor* will be responsible for all the indicated repairs.

2.2. "B" pass Hot condenser inlet tubesheet

In the photo below the hot condenser "B" pass tubesheet are shown. With closer inspection it could be seen that tube inlet wall thickness is very thin. Some of the pieces was broken of and the thickness was measured to be 0.1 to 0.2 mm. The damage mechanism is a combination of tube inlet end erosion and damaged caused by HP water jetting.

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Figure 3: Hot condenser "B" pass inlet tubesheet

A combination of tube pulling(including plugging) and re-expansion of the tube ends will be necessary to repair the damaged tube ends. It is suggested that the *Contractor* inspect the damaged tubes before quotation to ensure the extent of the damage are catered for. The *Contractor* will be responsible for pulling and plugging of the tubes as well as all expansion related activities.

3. Tube inlet end coating

1.1. Tube inlets on all the condenser tubes need to be coated. 50 mm of the tube inlets need to be coated. This includes all the tubesheets hot and cold.

1.2. Tube coating to be 0.3mm to 0.5mm DFT.

1.3. Two component solvent free amine cured epoxy coating.

1.4. Coating method statement to be presented and accepted by *Employer* at the kick of meeting

1.5. Surface preparation need to be discussed with the *Employer*.

4. General

1.1. The *Contractor* is responsible for all tooling

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1.2. Scaffolding will be supplied by the Employer

1.3. A QCP will be provided by the contractor detailing all activities

1.4. The method statement will be discussed and approved by Eskom before all work is started

1.5. A condenser flood test will be done after all work is completed to ensure that there are no leaking tubes. (No florescene)

1.6. All isolation will be the responsibility of the Employer

5. Price List

Item	Price
Tube repair on Cold condenser B pass	
Tube repair on Hot condenser B pass	
Tube end coating hot condenser inlet A pass	
Tube end coating cold condenser inlet A pass	
Tube end coating hot condenser inlet B pass	
Tube end coating cold condenser inlet B pass	

6. Technical evaluation criteria

6.1. Mandatory requirements

The submission of the returnables stated in this section is mandatory. Failure to submit any of these returnables will result in disqualification of the tender.

1. Verifiable experience of the Contractor or sub-Contractor or joint venture partner regarding expanding more than 10 000 tubes on site during a single project for a turbine size greater than 100 MW in the last 5 years.

6.2. Qualitative requirements

1. An example of the Contractor’s QCP for a typical condenser retube project

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2. Method statement for the repair of the tubes “B” pass cold condenser inlet waterbox
3. Method statement for the repair of the tubes “B” pass hot condenser inlet waterbox

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