



Power Station RoCa 3, Unit 6, GE/Alstom/ABB Steam Turbine, 2022
Section A – Project Description

2021/07/15
Version 1

Section A

Project Description

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1 Preamble

This technical specification is only valid with the latest Version of the Framework Contract between Client and Contractor.

This technical specification is applicable to the implementation of maintenance of the 111 MW Alstom Steam Turbine of the Uniper RoCa3 Power Station Unit 6.

It consists of following sections:

Section A	Project Description
Section B	Turbo-set work specific requirements
Section C	Scope of work – On Site
Section D	Scope of work – Off Site
Section E	Checklists

As a responsible organisation Uniper strives to create a working environment that safeguards the health and safety of everyone connected with our business. We make safety an integral part of everything we do based upon the principle “We don’t hurt people”. (Citation: Uniper Safety Management)

The CONTRACTOR is responsible for the complete and professional performance of the overhaul scope and for the proper disassembly and reassembly of the overhaul scope in accordance with good engineering practise state of the art / good engineering practice. It is the objective of the overhaul to provide a fully functional and operationally reliable turbo-set.

With respect to the scope of work the CLIENT requests the CONTRACTOR to provide, on the basis on his experience, technical / economical options to provide an optimised solution to the scope of work.

The CLIENT is entitled to have its interests represented by a third party. The third party will not be a competitor to the CONTRACTOR.



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2 CLIENT contact persons

The single points of contact for any requests concerning the content of the specification are the following advisors:

Uniper Power Plant RoCa Maintenance Manager Leo van der Vliet	e-mail: l.t.vandervliet@uniper.energy telephone: +31 628 022279
Uniper Power Plant RoCa Maintenance Engineer Turbine Henk Rijken	e-mail: h.rijken@uniper.energy telephone: +31 628 906476
Uniper Asset Support Central Europe Heiko Höhne	e-mail: heiko.hoehne@uniper.energy telephone: +49 162 4054855

3 Power Station Location

Address of the Power Station

Power Plant Roca
Capelseweg 400
UBEG Rotterdam
Netherlands

4 Brief description of the site and the steam turbine generator set overhaul project

The RoCa Power Plant has a total installed capacity of 111MW and is operated as a medium / peak- load power plant. It consists of three units of which the former ABB steam turbine unit 6 will, until the works to be carried out in 2022, have accumulated approx. 173kOH and approx. 900 starts.

A maintenance service of the 111MW GE/Alstom/ABB Steam Turbine Unit 6 is scheduled to be carried out from 23rd of May to 6th of July 2022.

During the maintenance (Standard EN 13306:2001) of the Alstom/ABB Steam Turbine, the CONTRACTOR shall perform all necessary works for the maintenance on the,

- HP- Turbine C-Overhaul
- IP- Turbine C-Overhaul
- LP- Turbine visual inspection
- Steam Turbo-set Bearings C-Overhaul
- Steam Turbine Valves C-Overhaul
- Auxiliary Systems minor inspection
- Decommissioning and commissioning

In parallel to the services of the 111MW GE/Alstom/ABB Steam Turbine Unit 6, the Generator of Unit 6 will be maintained. The maintenance activities for Unit 6 Generator will be tendered and put out separately.

Further the CONTRACTOR needs to be aware that besides the steam turbine diverse other works on the gas-turbine, the flue gas channel and the DCS system will be worked on. So the Contractor will need to respect other works within the turbine hall not having all time free access and right for continuous crane availability.



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5 Overhaul key dates in 2022

Shutdown of turbine generator set (unloading/disconnection from the grid)	14 th of May 2022
Shaft at standstill	18 th of May
Start of turbine works at the site	23 rd of May
Commissioning of turbine (cold commissioning)	1 st of July
Continuous turning gear operation	4 th of July
Unit commissioning period (hot commissioning)	8 th of July

The CONTRACTOR shall translate the scope of services described in the present Technical Specification into a milestone-based time schedule (Microsoft Project) stating manpower per shift and amount of shifts, with the offer.

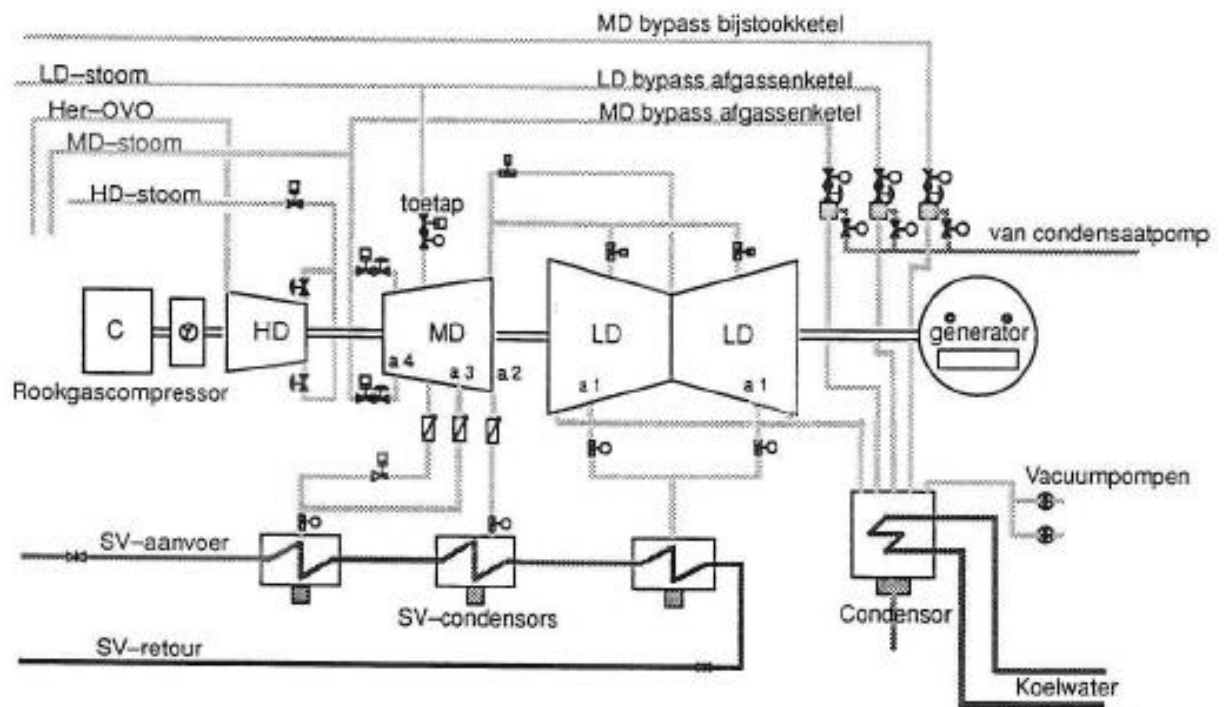
Manpower planning principles for **on-site works** are,

- two shifts (day- and night shift) with a maximum of 10 working hours per shift during de-assembly and reassembly phase
- one shift (day shift) with a maximum of 10 working hours per shift during overhaul phase
- weekly working cycle on site from Monday to Saturday

The CLIENT expects the CONTRACTOR to comply in the timeline of his activities with all key dates specified above. Findings and additional scope may lead to an extend of the overhaul.

6 Technical data of the steam turbine generator set

Model	ABB, Type DKYZZH3-2N23; Built 1996
Serial number of turbine generator set	GM01640
Type	Condensing turbine
Reheat system	single reheat
Number of steam extractions	5
Shaft trains / casings / exhaust steam flows	1 / 3 / 2 downwards
Turbine designed for driving a generator	
Nominal capacity	111 MW
Speed	3,000 rpm
HP steam mass flow	70 kg/s
HP steam parameters (upstream of valve block)	112 bar / 520°C
IP steam mass flow	82 kg/s
IP steam parameters (upstream of valve block)	41 bar / 520°C
IP extraction steam mass flow	6 kg/s
IP extraction steam parameters	5 bar / 245°C
LP admission steam mass flow	75 kg/s
IP steam parameters (upstream of valve block)	1,6 bar / 136°C
Exhaust steam pressure	0.018 bar
Cooling water temperature	6-29°C



7 Operating hours and number of starts

The following table shows the numbers of starts and operation hours **projected onto May 2022:**

Date of commissioning of the turbine generator set 1996

	Starts	Operating hours
Since commissioning	700	173.000
For HP- and IP- Steam Turbine no major overhaul has been carried out	700	173.000
Since last C-Overhaul of the LP- Steam Turbine done in 2015	300	29.000
Since last C-Overhaul of the Steam Inlet-Valves done in 2015	300	29.000

Documentation of previous inspections/overhauls of the turbine generator set that is relevant for the specified scope of services, and the operating manual of the turbine generator set can be inspected by the Contractor at the RoCa Power Station, provided such documents are available at the Power Station. Such documentation can also include technical reports relevant for the planned overhaul, such as service life expectancy analyses, instructions on special operational restrictions, reports on vibration behaviour, foundation displacement measurement and thermodynamic acceptance measurement reports.

8 Operating behaviour of the steam turbine generator set

Current operating behaviour Steam Turbine

The turbine generator set can be operated across the entire load range, without any operational restrictions. The nominal capacity is reached. The running behaviour of the steam turbine generator set according to DIN ISO 20816 is classed in “Zone A”. No gradual or sudden changes in vibration levels were observed.

The start-up behaviour is unproblematic, the warming-up speed / nominal speed is maintained by the speed control unit. Tests of valves and protective devices have been carried out and documented. The turbine generator set is normally taken off the grid by means of reverse power tripping with control valves being closed. Upon isolation from the grid, the speed drops observably. The vacuum tests carried out did not show any impermissible pressure rise in the condenser.

Operational and maintenance abnormality / major concerns Main Turbine

None

Announced OEM recommendations and / or Customer Information Bulletin

- OEM advise for the exchange of the high temperature bolting
- LSB Rotor Steeple Cracking OEM 2DESER00030P01c
- Vertical Guide Key Upgrade for bearing pedestals OEM 2DESER00089B01b
- Crack at shrink seat at HP-Inner casing OEM 2DESER00090B01
- Potential Crack in HP-Outer Casing in the transition area between valve inlet and horizontal part of casing

Expected status of the turbine generator set after overhaul

- a fully functional and operationally reliable turbine generator set

9 Decommissioning and commissioning of the steam turbine generator set

The CONTRACTOR shall promptly report to the CLIENT the completion of his reassembly work ready for operation in an end-of-work meeting to be held at the site. Such end-of-work meeting shall be attended by:

- CONTRACTOR's Site Manager, and
- CLIENT's Maintenance and Operation Manager.

During start-up of the turbine generator set by the CLIENT, the CONTRACTOR must be present at the power plant in order to carry out or arrange for tests, optimization or trouble shooting/repair work as may be necessary within his scope of services.

Technical support during decommission and cold / hot commissioning of the turbo-set by one qualified staff member (Commissioning Engineer) of the CONTRACTOR. The Commissioning Engineer shall carry out all checks and tests and supervise the putting back into service of the Steam Turbine by the CLIENT. The commissioning check and test procedure of the turbine protection loops, the switch over devices and the associated signal chains shall be checked for proper functioning. It is imperative that a full record procedure is implemented.

The plans and schedules for the commissioning of the Steam Turbine and the individual checks and tests shall be upfront discussed and agreed with the Plant Operation and Maintenance departments of the CLIENT. The scope of work is defined in section C7.

Within the scope of the Steam Turbine a minimum of 10 days of decommissioning and commissioning works must be included.

Testing and commissioning of the equipment at different load ranges will be done. The contractor shall submit proposed data jacks including verifying the proper behavior, testing alarms and trips, contract verifications and always with the presence of the CONTRACTOR test plan. The purpose is: determine compliance with specifications and verify suitability for commercial operation in all operating possibilities.

10 Steam turbine island I&C equipment

I&C equipment (displacement, pressure, temperature, and vibration measurement and position sensors) shall be disassembled and reassembled by the CONTRACTOR, if necessary for the work. Prior to commencement of disassembly work, the CONTRACTOR shall prepare and submit to the CLIENT a list of all I&C equipment items to be disassembled. After disassembly, the CONTRACTOR shall check all sensors for damage and operability (function check without calibration of the sensors). The CLIENT shall be informed promptly in writing of the condition of the equipment.

Reassembly shall be carried out by the CONTRACTOR. Where necessary, electrical cabling is to be removed and protected against damage.

After reassembly, the CONTRACTOR shall carry out all required mechanical and I&C setting work. I&C signal chains shall be function-tested (without calibration of the sensors) and documented by the CONTRACTOR, up into the existing I&C system/control room.

11 Scaffolding and Insulation

The CLIENT will award a separate contract for the scaffolding and insulation work required for implementation of the inspection work; the scope of work required in this regard shall be discussed and agreed between the CONTRACTOR and the CLIENT.

Scaffolding

The CONTRACTOR shall submit to the CLIENT a list of scaffolds to be set up; the list shall state the place/plant section, the work to be done/loading/design of the scaffolds and the target dates on which the CONTRACTOR will assume responsibility for the scaffolds as well as the target dates on which the scaffolds will be returned to the scaffolding contractor. Prior to commencing work, the CONTRACTOR shall have all scaffolds provided by the CLIENT inspected by a competent person and accept them for use, and return them upon completion of the work. Such competent person shall be responsible for the scaffolds for the period between acceptance and returning of the scaffolds. Any modifications to the scaffolds shall be subject to CLIENT's approval. A standard form provided by the CLIENT shall be used for approval and acceptance of the scaffold.

Insulation

On a date to be agreed in advance, the site managers of the insulation contractor and of the CONTRACTOR shall do a joint acceptance inspection of the turbine insulation dismantling work performed. Subsequent complaints and claims regarding insulation removal work are thus excluded.

12 Steam turbine auxiliary tools check

Immediately upon contract award, the CONTRACTOR shall inspect the auxiliary tools (tools, gear and equipment) available at the power plant for completeness and proper function by visual inspection directly after contract award. The CLIENT will support the CONTRACTOR in doing such inspection. Any deviations shall be recorded in a deviation report, and shall be submitted to the CLIENT, stating:

- any missing auxiliary tools (spreader bars, auxiliary bearings etc.),
- auxiliary tools that were not tested (in particular load handling attachment).

Together with the deviation report and not later than two weeks from the inspection of the auxiliary tools, the CONTRACTOR shall compile and submit to the CLIENT a spare parts offer covering "Auxiliary Tools" and "Tests".

Upon completion of the overhaul, the CONTRACTOR shall return the auxiliary tools to the CLIENT in a functional condition. Any damaged or missing auxiliary tools shall be identified to the CLIENT.

13 Cutting and welding work valid for pipework

Cutting and welding work on pipes (drain, vent and instrumentation piping) for making the necessary adjustments / modifications to pipework and / or pipe routing **will be done by the CONTRACTOR**, including all work for weld seam preparation, provision of welding equipment, heat treatment, testing and documentation. The CONTRACTOR shall be responsible for identifying the base material based on his design and workshop drawings.

The CONTRACTOR shall submit to the CLIENT a list of pipework's to be set up. The list shall state the place/component section and the target dates on which the works need to be done.

The CONTRACTOR shall offer methodology and Materials for De- and Reconnection of the pipework with the bid.