

Section D

Scope of work – Off Site

Steam Turbine & Associated Components

Content of Section D

1. High Pressure Turbine Inner Block
2. Intermediate Pressure Turbine Rotor
3. Intermediate Pressure Turbine Inner Casing

Works

The following scope of works does not absolve the CONTRACTOR from his responsibility to carry out all works required for the proper disassembly/reassembly of the scope according to good engineering practise good engineering practices. The CONTRACTOR shall advise their methodology during the technical negotiations for the required works to ensure an appropriate work quality.

Before starting work, it is to be assured that:

- The Permit-to-Work is in place and the working conditions are well prepared.
- All method statements and risk assessments for all works are in place.
- All safety precautions have been carried out in accordance with the risk assessment.
- All affected electrical components are inactive and free from electric current.
- All pressures, temperatures and residual energies (e.g. position, tension, motion and energy storage) are reduced to safe levels.

The CONTRACTOR shall at all-time carry out his works respecting the following requirements in all work phases.

The CONTRACTOR shall at least carry out the following works (which are not intended to be fully exhaustive nor limiting):

- All disassembled parts shall be marked clearly with their installation point and shall be stored properly in a safe and dry location. The parts shall not to be exposed to a corrosive or aggressive ambient. For adjustable parts all according data shall be recorded.
- The risk of component failure from stress corrosion can be significantly reduced by strict adherence to cleanliness during handling. Contamination with grease and cutting fluids should be



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avoided and only approved anti-seize, lubricant and NDT consumables should be used. Contractor shall advise what compounds are to be used and shall provide a statement to confirm their suitability for use on turbine components.

- An immediate fact finding of all components in the as-found and cleaned condition by visual inspection for damage, corrosion, deposits, stains, wear and broken-out areas shall be conducted. The evaluation of the components shall be conducted by the CONTRACTOR before the common fact finding together with the CLIENT. Within this evaluation all relevant data and tolerances shall be recorded. The desired condition and the proposed tolerances shall be advised which must take into consideration the movement of these components during operation. The Contractor shall provide recommendations for component refurbishment, where appropriate.
- Compile component specific 'as-found' condition reports with recommendations for component refurbishment where appropriate.
- Clean all flanges, tapped holes, contact surfaces, seal faces, shims, bolts and nuts, pins and all disassembled body and machine parts (remove dirt/ stains/ deposits), recondition them (smoothing of defective spots) and check them for usability.
- Prepare the component surfaces for non-destructive testing. If necessary, the bodies shall be abrasive blasted (dust-free or dust reduced). The testing points shall be agreed between the CONTRACTOR, CLIENT and the NDT Personnel.
- Opened components (e.g. tanks, casings, pipes) shall be suitably covered (e.g. by sheets and boards). All non-accessible areas must be examined for dust and foreign particle/items immediately before reassembly. If necessary, the CONTRACTOR shall have a suitable, high flux borescope available and shall record the examination on a storage medium.

All necessary spare parts from the fixed and optional scope of works shall be offered separately. The delivery time and the place of installation of the spare parts shall be mentioned clearly in the separate spare part offer.

The spares from UNIPER warehouse RoCa needs to be checked for usability by the Contractor. If additional processing of the warehouse spares is necessary e.g. adjusting, finishing a finding report resp. a fact finding matrix record is required. The Contractor is responsible and accountable to perform the processing works.

Before and during the overhaul monitoring of the balance of available spare parts for adequate number and usability shall take place by the CONTRACTOR.



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Abbreviations:

CV	Control Valve	NDT	None Destructive Testing
ESV	Emergency Stop Valve	OEM	Original Equipment Manufacturer
NRV	Non-Return Valve	P	Protocol
H	Hold Point	PT	Penetration Test
HAZOP	Hazard and Operability Studies	QA/QC	Quality Assurance/Quality Control
HP	High Pressure	QM	Quality Management
I&C	Information and Control	SIL	Safety Integrity Level
IP	Intermediate Pressure	SIS	Safety Instrumented System
ITP	Inspection and Test Plan	UT	Ultrasonic (Examination) Test
LP	Low Pressure	VT	Visual Test
MT	Magnetic Particle Test	W	Witness Point
MW	Megawatt		

1 High Pressure Turbine Inner Block

The CONTRACTOR shall be responsible and accountable for executing the following scope of work in accordance with the requirements described in the preceding section "Works" / Part D:

- Inspection and repair of the High Pressure Turbine Inner Block (Rotor and Inner Casing) components, fact-finding, cleaning, nondestructive testing and repair. The equipment to fulfill the assembly works, transports, checks, assessments and repair works are inherent part of the contractor services and performances.
- Coordination and execution of internal and external transports including transport racks, low loaders and towing vehicles, other means of transport and necessary public/official approvals for the components of the turbine.
- To ensure the quality of work, it is necessary for the contractor to plan, prepare and document the sequence of work processes in detail.
- **The tools required for disassembly and reassembly of the HP turbine inner block, such as shrink ring burners and lifting devices etc., shall be provided by the contractor**
- To ensure build quality it is imperative that a detailed check and reporting protocol is implemented in all phases of termination e.g. preparation, execution, assessment, documentation.
- Reassembling of the HP Turbine Inner Block in the workshop and delivery ready for reinstallation in the PP RoCa

The contractor is responsible and in charge of the transport of the HP turbine inner block. The transport interface between the power plant works (Part C) and the plant works (Part D) at the contractor's workshop is the power house crane at the RoCa power plant.

1.1 High Pressure Turbine Inner Block Transport

The following works shall be carried out:

Works	ITP	Client point
HP turbine - inner block transport for repair at the contractor's workshop • Transport planning and execution including official approval from RoCa power plant to the contractor's plant and return transport to the power plant after completion of the work • Provision by the contractor of a transport rack suitable for road transport on trucks for the HP inner block. The slinging equipment for the components on the transport rack or to the transport vehicle	P	

Works	ITP	Client point
shall be provided by the contractor and delivered to the RoCa power plant with the transport rack • Delivery of the transport rack and the slinging equipment with sufficient temporal advance (at least 24 hours) before the approved departure date of the transport • Load securing, packaging and preservation of the HP inner block. • Carry out an incoming inspection at the Contractor's plant to check for transport damage • Collection and return transport of the transport frame and the slinging equipment • Provision of a transport rack suitable for the HP rotor and HP inner casing for internal transport in the Contractor's plant and for blasting work etc.		

1.2 High Pressure Turbine Assembly – Inner Block

The following works shall be carried out:

Works	ITP	Client point
HP turbine - inner block assembly works - Carry out a general entrance and visual inspection of the accessible housing and rotor surfaces and in particular of the bearing points for damage, especially transport damage. - Dismantling and reassembly of transport locks - Transport locks must be marked in a conspicuous colour and described in the documentation (number, individual parts and installation site). - Measure radial clearances of first stage vane and last stage blade before dismantling - Check radial and axial minimum clearance of rotor to casing before dismantling - Open the HP inner block. Please note that RoCa has no shrink ring heating device available. - Draw up assembly protocol for HP inner block (shrink rings, shims) during disassembly and reassembly. - Place the rotor in the correct axial position in the inner casing, check and record axial and radial blades, vanes and balancing piston clearances. - During reassembly, the axial and radial clearances must be checked	VT, P P P P P	W W W W W



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Works	ITP	Client point
and recorded after assembling the rotor into the inner casing before and after the inner block has been shrunk. The recorded clearances of reassembly must be compared with the clearances of disassembly. All disassembly and assembly dimensions are part of the documentation and must be handed over to UNIPER together with the factory assembly protocol upon delivery of the HP inner block. All necessary spares for the scope of works shall be offered in a separate spare part offer.	P	W
HP turbine – shrink rings - Blast cleaning of the shrink rings with cleaned sand or glass beads (<0.1mm) with the aim of achieving the surface quality required for non-destructive testing. - Clean the components from the blasting material and prepare them for non-destructive testing. - Perform NDT crack testing, visual and dimensional inspection of the shrink rings. Measure and record the diameter (roundness) of the shrink rings. - Perform a hardness measurement i.e. mechanical technological testing and evaluation and microstructure examination (replica) of the shrink rings to evaluate the material condition. - All necessary spares for the scope of works shall be offered in a separate spare part offer. Please note: The contractor is expected to provide a recommendation for testing the shrink rings.	VT, MT P	

1.3 High Pressure Turbine Inner Casing

The following works shall be carried out:

Works	ITP	Client point
HP turbine – inner casing works - Visual and dimensional inspection - in the uncleaned state of the casing surfaces, partial joints, steam inlet and steam inlet piston rings, guide vanes, balancing piston segments and casing sealing strips for correct seating, offset, impact marks (FOD), tear and wear and crack indications. - Check correct and tight fitting of the stationary turbine blades - Disassembly, visual and dimensional inspection of the steam inlet piston rings and the balancing piston segments including their screws and springs. - Measure deformation (casing collapse / ovality) at relevant points of the casing halves and compare with the diameter of the rotor. Record and evaluate deformation - Carry out flatness measurements lengthwise and crosswise on the housing halves. Record and evaluate gap measurement - Carry out gap measurements on the housing halves placed loosely on top of each other. Record and evaluate casing gaps - Overhaul the balancing piston segments and reassemble with new springs and screws. - Overhaul the piston rings and reassembly with new locking pins. - All necessary spares for the scope of works shall be offered in a separate spare part offer. Please note: The incoming inspection at the factory, the recording of findings and the preparation of the corresponding protocols represent a milestone in the revision planning and are accompanied by UNIPER on site - CLIENT participation point.	VT, P P VT, P P P	W W
HP turbine – inner casing blast cleaning and NDT - Prepare the inner casing blade grooves and reusable sealing stripes for blast cleaning by covering them. Avoid the entrance of blast material to the blade grooves - Blast cleaning of the inner casing with cleaned sand or glass beads (<0.1mm) with the aim of achieving a surface quality required for the NDT inspection. - Clean the components from the blasting material and prepare them for non-destructive testing. - NDT inspection of the inner and outer surfaces, especially at cross	VT, PT,	W

Works	ITP	Client point
section transitions (small radii, drainage holes, bushings and connections and supports of the casings) for wear, damage and crack indications Microstructure analysis (replica) of the inner casing in the area of the steam inlet. The test areas are to be agreed between Contractor and Client. Scope 2x replica and microstructure evaluation.	MT P	W
HP turbine – inner casing sealing stripes - Visual and dimensional check of the sealing stripes – check stripes for reusability - Straighten and deburr reusable sealing stripes Workshop OPTION 1: Replacement of 20 stripes of the HP inner casing sealing stripes between the turbine stages or the balancing piston. Disassembly of the inner casing sealing stripes. "Cleancut" the groove geometry and visual inspection for crack indications. Installation of new sealing stripes adapted to the geometry and diameter. The supply of the necessary spare parts (sealing tape and caulking wire) are to be offered as part of this option. Workshop OPTION 2: Replacement of 50 stripes of the HP inner casing sealing stripes between the turbine stages. Disassembly of the inner casing sealing stripes. "Cleancut" the groove geometry and visual inspection for crack indications. Installation of new sealing stripes adapted to the geometry and diameter. The supply of the necessary spare parts (sealing tape and caulking wire) are to be offered as part of this option.	P P	
HP turbine – inner casing joint flange bolts - Draw up assembly report for the flanged connection- record hydraulic pressure and ITH cylinder used. - Disassembly of the joint flange bolts from the casing - increased disassembly effort is to be assumed. - NDT and dimensional inspection of the bolts and nuts for damage, crack indications and reusability. - Re-cut and clean the thread of the part joint screw in the lower part of the outer housing. - All bolts and nuts with operating temperatures above 380deg will be replaced without any testing by the CONTRACTOR - All other bolts and nuts shall be inspected and the inspection documented in accordance with VGB R505 (Version 2004) - All necessary spares for the scope of works shall be offered in a	P VT, PT. P	W



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separate spare part offer For the exchanged bolts with operating temperatures above 380deg the bidder is requested to separately price these bolts within the spare part offer		
For potential further off site works see also chapter 1.3 under part C of this tender. (Potential malfunctions)		

1.4 High Pressure Turbine Rotor

The following works shall be carried out:

Works	ITP	Client point
HP turbine – rotor - Carry out a general entrance and visual inspection of the accessible rotor and blade surfaces and bearing points for damage, in particular transport damage. - Visual and dimensional inspection, concentricity check and inspection of the rotor -in the uncleaned state of the shaft ends, rotor and blade surface, sealing tapes, shims and cover plates for firm and correct fit, offset, scuffing and tarnish marks, impact marks, coatings, wear and crack indications. - Draw up visual fact finding, dimensional, and radial and axial run-out reports - pay particular attention to protruding turbine blade inserts and turbine blade shroud displacements and gaps. Communicate these immediately. Please note: The incoming inspection at the factory, the recording of findings and the preparation of the corresponding protocols represent a milestone in the revision planning and are accompanied by UNIPER on site - CLIENT participation point.	P VT, P VT, P	W W
HP rotor – balancing stub Provision and installation of the balancing stubs resp. auxiliary bearing stubs at turbine side and generator side for the HP rotor by the CONTRACTOR Please note: At UNIPER power stations and at the RoCa power station there are no balancing stubs for the HP rotor available. The balancing stubs can also be installed at the contractor's workshop. Suitability Transport frame must take this into account.	P	
HP turbine – rotor blast cleaning and NDT - Prepare the rotor shaft ends, couplings, rotor blade grooves and reusable sealing stripes for blast cleaning by covering them. Avoid the entrance of blast material to the blade grooves - Blast cleaning of the inner casing with cleaned sand or glass beads (<0.1mm) with the aim of achieving a surface quality required for the NDT inspection. - Clean the components from the blasting material and prepare them for non-destructive testing.		

Works	ITP	Client point
• NDT inspection of the complete HP rotor and HP turbine blades (turbine blades staying assembled) for wear and tear, damage, displacement and crack indications • Portable hardness measurement i.e. mechanical technological testing and evaluation of the material condition at the shaft surface in the steam inlet area. • Microstructure examination (replica) of the turbine shaft in the steam inlet area - scope 2x replica including microstructure evaluation • Microstructure examination (replica) of the turbine shaft in a thermally unloaded area (e.g .coupling) - scope 1x replica and microstructure evaluation as comparative examination	VT, PT, MT P P P	W
HP turbine – rotor general maintenance • Visual and dimensional inspection of the clutch bores and clutch recess • Manual reworking of the clutch flange (clutch centring). Renew corrosion protection of the clutch • Create and communicate "just in time" dimensional protocol for the adjustment of the "coupling" interface between power plant and workshop • Clean the shaft areas of the bearing and seals. Draw up a dimensional record • All necessary spares for the scope of works shall be offered in a separate spare part offer	VT, P	W
HP turbine – rotor sealing stripes • Visual and dimensional check of the sealing stripes – check stripes for reusability • Straighten and deburr reusable sealing stripes Workshop OPTION 3: Replacement of 20 stripes of the HP Rotor sealing stripes between the rotor blades Disassembly of the rotor sealing stripes between the rotor blades. "Cleancut" the groove geometry and visual inspection for crack indications. Installation of new sealing stripes adapted to the geometry and diameter. The supply of the necessary spare parts (sealing stripes and caulking wire) are to be offered as part of this option.	P P	
Workshop OPTION 4: Replacement of 20 stripes of the HP Rotor balancing piston sealing stripes Disassembly of the balancing piston sealing stripes. "Cleancut" the	P	

Works	ITP	Client point
groove geometry and visual inspection for crack indications. Installation of new sealing stripes adapted to the geometry and diameter. The supply of the necessary spare parts (sealing stripes and caulking wire) are to be offered as part of this option. Workshop OPTION 5: Replacement of 20 stripes of the HP Rotor shaft sealing area Disassembly of the shaft sealing stripes. "Cleancut" the groove geometry and visual inspection for crack indications. Installation of new sealing stripes adapted to the geometry and diameter. The supply of the necessary spare parts (sealing stripes and caulking wire) are to be offered as part of this option.	P	
HP turbine – rotor high speed balancing • Before extracting/disassembly record all installed balancing weights (distribution plan) and disassemble them • Visual inspection and cleaning of the balancing grooves. • HP turbine rotor balancing at high speed (balancing quality G 1.6 according to DIN ISO 1940-1) including execution of all necessary preparatory and follow-up measures including delivery of the required balancing weights. • Draw balancing weights distribution plan after balancing • Closing concentricity check and visual and dimensional inspection of the rotor blades, cover plates, shims, sealing strips for firm and correct seating and alignment after balancing runs.	P P P	W W W

2 Intermediate Turbine Rotor

The CONTRACTOR shall be responsible and accountable for executing the following scope of work in accordance with the requirements described in the preceding section "Works" / Part D:

- Inspection and repair of the High Pressure Turbine Inner Block (Rotor and Inner Casing) components, fact-finding, cleaning, nondestructive testing and repair. The equipment to fulfill the assembly works, transports, checks, assessments and repair works are inherent part of the contractor services and performances.
- Coordination and execution of internal and external transports including transport racks, low loaders and towing vehicles, other means of transport and necessary public/official approvals for the components of the turbine.
- To ensure the quality of work, it is necessary for the contractor to plan, prepare and document the sequence of work processes in detail.
- To ensure build quality it is imperative that a detailed check and reporting protocol is implemented in all phases of termination e.g. preparation, execution, assessment, documentation.
- Reassembling of the IP Turbine Rotor in the workshop and delivery ready for reinstallation in the PP RoCa

The contractor is responsible and in charge of the transport of the IP turbine rotor. The transport interface between the power plant works (Part C) and the plant works (Part D) at the contractor's plant is the power house crane at the RoCa power plant.

2.1 Intermediate Pressure Turbine Rotor Transport

The following works shall be carried out:

Works	ITP	Client point
IP turbine – rotor for repair at the contractor's workshop • Transport planning and execution including official approval from RoCa power plant to the contractor's plant and return transport to the power plant after completion of the work • Provision by the contractor of a transport rack suitable for road transport on trucks for the IP turbine rotor. The slinging equipment for the components on the transport rack or to the transport vehicle shall be provided by the contractor and delivered to the RoCa power plant with the transport rack • Delivery of the transport rack and the slinging equipment with suffi-	P	

Works	ITP	Client point
cient temporal advance (at least 24 hours) before the approved departure date of the transport - Load securing, packaging and preservation of the IP rotor. - Carry out an incoming inspection at the Contractor's plant to check for transport damage - Collection and return transport of the transport frame and the slinging equipment - Provision of a transport rack suitable for the IP rotor for internal transport in the Contractor's plant		
IP rotor – balancing studs Provision and installation of the balancing stubs resp. auxiliary bearing stubs at turbine side and generator side for the IP rotor by the CONTRACTOR Please note: At UNIPER power stations and at the RoCa power station there are no balancing stubs for the IP rotor available. The balancing stubs can also be installed at the contractor's workshop. Suitability Transport frame must take this into account.	P	

2.2 Intermediate Pressure Turbine Rotor

The following works shall be carried out:

Works	ITP	Client point
IP turbine – rotor workshop - Carry out a general entrance and visual inspection of the accessible rotor and blade surfaces and bearing points for damage, in particular transport damage. - Visual and dimensional inspection, concentricity check and inspection of the rotor of the shaft ends, rotor and blade surface, sealing stripes, shims and cover plates for firm and correct fit, offset, scuffing and tarnish marks, impact marks, coatings, wear and crack indications. - Draw up visual fact finding, dimensional, and radial and axial run-out reports - pay particular attention to protruding turbine blade inserts and turbine blade shroud displacements and gaps. Communicate	P VT, P VT, P	W W

Works	ITP	Client point
these immediately • Dimensional check of the IP rotor. • Visual and dimensional inspection of the clutch bores and clutch recess. Manual reworking of the clutch flange (clutch centring). Re-new corrosion protection of the clutch • Create and communicate "just in time" dimensional protocol for the adjustment of the "coupling" interface between power plant and workshop • Clean the shaft areas of the bearing and seals. Draw up a dimensional record • Prepare the rotor shaft ends, couplings, rotor blade grooves and reusable sealing stripes for blast cleaning by covering them. Avoid the entrance of blast material to the blade grooves • Blast cleaning of the IP rotor • Visual and dimensional check of the sealing stripes – check stripes for reusability. Straighten and deburr reusable sealing stripes • NDT inspection of the complete HP rotor and HP turbine blades (turbine blades staying assembled) for wear and tear, damage, displacement and crack indications • Portable hardness measurement i.e. mechanical technological testing and evaluation of the material condition at the shaft surface in the steam inlet area. • Microstructure examination (replica) of the turbine shaft in the steam inlet area - scope 2x replica including microstructure evaluation • Microstructure examination (replica) of the turbine shaft in a thermally unloaded area (e.g. coupling) - scope 1x replica and microstructure evaluation as comparative examination • All necessary spares for the scope of works shall be offered in a separate spare part offer	P P P VT, PT, P PT, P HT, P P P	W W
IP turbine – optional rotor repair works depending on finding situation Workshop OPTION6 : Replacement of 20 stripes of the IP Rotor sealing stripes between the rotor blades Disassembly of the rotor sealing stripes between the rotor blades. "Cleancut" the groove geometry and visual inspection for crack indications. Installation of new sealing stripes adapted to the geometry and diameter. The supply of the necessary spare parts (sealing stripes and caulking wire) are to be offered as part of this option. Workshop OPTION 7: Replacement of 20 stripes of the IP Rotor shaft sealing area	P	W

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3 Intermediate Turbine Inner Casing

The CONTRACTOR shall be responsible and accountable for executing the following scope of work in accordance with the requirements described in the preceding section "Works" / Part D:

- Inspection and repair of the Intermediate Turbine Inner Casing components, fact-finding, cleaning, nondestructive testing and repair. The equipment to fulfill the assembly works, transports, checks, assessments and repair works are inherent part of the contractor services and performances.
- Coordination and execution of internal and external transports including transport racks, low loaders and towing vehicles, other means of transport and necessary public/official approvals for the components of the turbine.
- To ensure the quality of work, it is necessary for the contractor to plan, prepare and document the sequence of work processes in detail.
- To ensure build quality it is imperative that a detailed check and reporting protocol is implemented in all phases of termination e.g. preparation, execution, assessment, documentation.
- Reassembling of the IP Turbine Inner Casing in the workshop and delivery ready for reinstallation in the PP RoCa

The contractor is responsible and in charge of the transport of the IP Turbine Inner Casing. The transport interface between the power plant works (Part C) and the plant works (Part D) at the contractor's plant is the power house crane at the RoCa power plant.

3.1 Intermediate Pressure Turbine Inner Casing Transport

The following works shall be carried out:

Works	ITP	Client point
IP turbine – inner casing transport for repair at the contractor's workshop • Transport planning and execution including official approval from RoCa power plant to the contractor's plant and return transport to the power plant after completion of the work • Provision by the contractor of a transport rack suitable for road transport on trucks for the IP turbine inner casing half's. The slinging equipment for the components on the transport rack or to the transport vehicle shall be provided by the contractor and delivered to the RoCa power plant with the transport rack • Delivery of the transport rack and the slinging equipment with suffi-	P	

Works	ITP	Client point
cient temporal advance (at least 24 hours) before the approved departure date of the transport • Load securing, packaging and preservation of the IP turbine inner casing. • Carry out an incoming inspection at the Contractor's plant to check for transport damage • Collection and return transport of the transport frame and the sling-ing equipment		

3.2 Intermediate Pressure Turbine Inner Casing

The following works shall be carried out:

Works	ITP	Client point
IP turbine – inner casing workshop (4 vane carriers) • Carry out a general entrance and visual inspection of the accessible casing and blade surfaces and for damage, in particular transport damage. • Visual and dimensional check of the sealing stripes – check stripes for reusability • Prepare inner casings blade grooves and reusable sealing stripes for blast cleaning by covering them. Avoid the entrance of blast material to the blade grooves. • Blast cleaning of the inner casing • NDT inspection of the inner and outer surfaces, especially at cross section transitions (small radii, drainage holes, bushings and connections and supports of the housings) for wear, damage and crack indications • Microstructure analysis (replica) of the inner casing in the area of the steam inlet. The test areas are to be agreed between Contractor and Client. Scope 2x replica and microstructure evaluation. • Check ink imprint of the split joint in bolted and unbolted condition • Measure ovality and gapping of the inner casing in bolted and unbolted condition • Perform radial and axial runout check of the bolted inner casing and ensure that the axis of the casing is known for the reinstallation. • All necessary spares for the scope of works shall be offered in a separate spare part offer All necessary spares for the scope of works shall be offered in a separate spare part offer.	P VT, P P VT, PT, P P MT, P PT, P P	W W W w w W W

Works	ITP	Client point
IP inner casing - joint flange bolts • Draw up assembly report for the flanged connection- record hydraulic pressure and ITH cylinder used • Disassembly of the joint flange bolts from the inner casing - increased disassembly effort is to be assumed • NDT and dimensional inspection of the bolts and nuts for damage, crack indications and reusability • Re-cut and clean the thread of the part joint screw in the lower part of the inner casing • All bolts and nuts with operating temperatures above 380deg will be replaced without any testing by the CONTRACTOR • All other bolts and nuts shall be inspected and the inspection documented in accordance with VGB R505 (Version 2004) • All necessary spares for the scope of works shall be offered in a separate spare part offer For the exchanged bolts with operating temperatures above 380deg the bidder is requested to separately price these bolts within the spare part offer	P PT,P	
IP inner casing – blast cleaning • Installation and operation of a temporary blast cleaning system including blast plant, diesel driven compressor, local exhaust system on site RoCafor blast cleaning of turbine components. • Blast cleaning with cleaned sand or glass beads (<0.1mm) with the aim of achieving a surface quality required for the NDT inspection. • Disposal /recovery of the used blast material • Clean the components from the blasting material and prepare them for non-destructive testing.		
IP turbine – inner casing sealing stripes • Visual and dimensional check of the sealing stripes – check stripes for reusability • Straighten and deburr reusable sealing stripes Workshop OPTION 8: Replacement of 20 stripes of the IP inner casing sealing stripes between the turbine stages Disassembly of the inner casing sealing stripes. "Cleancut" the groove geometry and visual inspection for crack indications. Installation of new	VT, P P	



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sealing stripes adapted to the geometry and diameter. The supply of the necessary spare parts (sealing tape and caulking wire) are to be offered as part of this option. Workshop OPTION 9: Replacement of 60 stripes of the IP inner casing sealing stripes between the turbine stages Disassembly of the inner casing sealing stripes. "Cleancut" the groove geometry and visual inspection for crack indications. Installation of new sealing stripes adapted to the geometry and diameter. The supply of the necessary spare parts (sealing tape and caulking wire) are to be offered as part of this option.		