

SCOPE OF WORK		SOW Reference	
<b>Transformer maintenance from 315 KVA /380V to 1000 MVA/765 kV.</b>  <b>High level SOW</b>  1. Total regasketting  2. Transformer exchanger by means of crane  3. Transformer exchange by means of rigging  4. Partial drain and minor oil leak repair  5. Oil top up  6. Transformer Internal inspection  7. Weld Transformer top cover  8. Sergi work		<b>No:</b>	<b>Rev:</b>
<b>ROTEK REF. NO: ENABLING CONTRACT</b>			

Detail Scope

1. Total regasketting

- Travel to site
- Site Establishment
- Take oil sample from bottom main tank and analyze for gases
- Take work permit, conduct risk analysis and complete workers register
- Disconnect and mark secondary wiring from fans, CT's, gauges, etc.
- Complete wash transformer
- Totally drain oil into the iso tanks under positive dry air
- Pressurize transformer for 24hrs
- Conduct dew point test
- Disconnect cable from the fans/CT's
- Remove fans
- Remove radiators
- Remove Pipe work
- Remove header pipe
- Disconnect and remove HV bushing
- Disconnect and remove MV bushing

Disconnect and remove LV bushing

Remove and regasket HV Turrets

Remove and regasket MV Turrets

Regasket and install HV bushing

Regasket and install MV bushing

Regasket and install LV bushing

Regasket inspection covers

mark and disconnect CT terminal block

Regasket/replace CT terminal block

Install terminal block

remove and lower down the conservator tank

Regasket conservator tank

Install Conservator tank

Regasket/replace Header valves

Regasket and install header pipes-replace Jonson coupling

regasket and install pipe work -replace flexibles, buchholz

Replace radiator valves

install radiator valves

install fans

regasket/replace -PRV

regasket/replace Temperature probes

Replace valves

Cable work

pressurize transformer and conduct soap test

conduct dew point test after 24hrs

Travel from site

## **2. Transformer exchange by means of crane**

Travel to site

Take work permit, conduct risk analysis and complete workers register

Site establishment

Take oil sample prior to commencing

Pipe establishment

Oil drain (full or partially)

Dismantle and remove conservator tank

Disconnect and remove HV bushing

Disconnect and remove MV bushing

Disconnect and remove LV bushing

Remove and regasket HV Turrets

Remove and regasket MV Turrets

Remove radiators and blank off

Remove Pipe work and bank off

Remove selector and blank off

Conduct insulation resistance

Fit Impact recorder

Jack and move Transformer out of position where required

Load faulty transformer by means of mobile crane

Offload the replacement transformer to the Position

install identification tags on all parts and label accordingly

load transformer parts

Transport Transformer part to Rosherville -ER

Transport Transformer to Rosherville -ER

Hand over to customer

Clear site

### **3. Transformer exchange by means of Rigging**

#### **Dismantle and load replacement Transformer**

Travel to site

Take work permit, conduct risk analysis and complete workers register

Site establishment

Take oil sample prior to commencing

Pipe establishment

Oil drain (full or partially)

Pressurize transformer with dry air for 24hrs

Performer dew point test

Dismantle and remove conservator tank

Disconnect and remove HV bushing  
Disconnect and remove MV bushing  
Disconnect and remove LV bushing  
Remove and blank HV Turrets  
Remove and blank MV Turrets  
Remove radiators and blank off  
Remove and blank off header pipe  
Remove Pipe work and bank off  
Remove selector and blank off  
Conduct insulation resistance  
Fit Impact recorder  
Jack and move Transformer out of position where required  
Load faulty transformer on the low bed or beam wagon by means of rigging  
install identification tags on all parts and label accordingly  
load transformer parts  
Transport Transformer part from storage to Site  
Transport Transformer from Storage to site  
Hand over to customer  
Clear site

### **Dismantle and load faulty Transformer**

Travel to site  
Take work permit, conduct risk analysis and complete workers register  
Site establishment  
Take oil sample prior to commencing  
Pipe establishment  
Oil drain (full or partially)  
Pressurize transformer with dry air for 24hrs  
Performer dew point test  
Dismantle and remove conservator tank  
Disconnect and remove HV bushing  
Disconnect and remove MV bushing  
Disconnect and remove LV bushing

Remove and blank HV Turrets

Remove and blank MV Turrets

Remove radiators and blank off

Remove and blank off header pipe

Remove Pipe work and bank off

Remove selector and blank off

Conduct insulation resistance

Fit Impact recorder

Jack and move Transformer out of position where required

Load faulty transformer on the low bed or beam wagon by means of rigging

install identification tags on all parts and label accordingly

load transformer parts

Transport Transformer part from site to ERI

Transport Transformer from Site to ERI

Hand over to customer

Clear site

Clear site

### **Offload Replacement Transformer and assemble**

Travel to Site

Take work permit, conduct risk analysis and complete workers register

test the transformer before offloading

Establishment of rigging equipment

Offload transformer by mean of rigging

conduct insulation test the transformer after offloading

Move transformer to the final position by means of rigging

conduct insulation test the transformer on final position

remove impact recorder and download readings

Performer dew point test

install conservator tank

Regasket and install HV Turrets

Regasket and install MV Turrets

Regasket and install HV bushings

Regasket and install MV bushings

Regasket and install LV bushings

Regasket and install header pipes

Regasket and install radiators

Install selector switches

Install pipe, buchholz, PRV

Install cooling fans

Conduct insulation resistance

do cable work

Conduct internal inspection

Pressurize Transformer to 25kpa for 24hrs

Conduct soap test

Performer dew point test

Hand over

Clear site

#### **4. Partial drain and minor oil leak repair**

Travel to site

Take work permit, conduct risk analysis and complete workers register

Site establishment

Partial drain oil to required level

Regasket Inspection covers

Regasket CT terminal box

Regasket Temperature probe

Regasket Pipe work and buchholz

Regasket/Nip up HV bushings

Regasket/Nip up MV bushings

Regasket/Nip up LV bushings

Regasket/Nip up Neutral bushings

Regasket/Nip up earthing bushings

Nip up the whole transformer

Clean and Clear Site

Hand over

Travel from site

## **5. Transformer oil top up**

Travel to site

Take work permit, conduct risk analysis and complete workers register

Site establishment

Top up transformer without Airbag

Top up transformer with Airbag

Remove pipes and pump

Clean site

Clear Site

Hand over

Travel from site

## **6. Transformer Internal Inspection**

Travel to site

Take work permit, conduct risk analysis and complete workers register

Site establishment

Conduct insulation Resistance test

Drain oil from Transformer into clean ISO tank

Pressurize transformer with dry air

Performer dew point test after 24hrs

Drain residual oil from transformer

Open Inspection covers

Connect and start dehumidifier machine

carry out internal inspection

report on finding

Refit Inspection covers

Pressurize transformer with dry air

Performer dew point test after 24hrs

Clean and Clear Site

Hand over

Travel from site

## **7. Weld transformer main top cover**

Travel to site

Safety & Environmental induction training – Central Grid – approximately 2 hours

Take work permit, conduct risk assessments and complete workers register

Establish site

Take work permit, conduct risk analysis and complete workers register

Transformer must be sealed off and pressurized with nitrogen for welding

Remove every second lid bolt and weld pin into place. Complete all bolts

Weld angle iron around edges of tank and lid flanges

Pressurize transformer with nitrogen (20 kPA) and check for leaks by using soap

Complete daily activity report

Complete handing over certificate

Complete transformer / reactor work report

Clean and clear site

Hand over

Travel from site

## **8. Sergi Work**

Travel to site

Take work permit, conduct risk analysis and complete workers register

Site establishment

Activation and de-activation relief system

Maintenance and assessment

Clean and Clear Site

Hand over

Travel from site



DOCUMENTATION REQUIREMENTS			
Signed scope of work			
Production & Quality Plan (PQP)			
Grid authorisation in terms of ORHVS –			
Safety & Environmental Induction training			
Competency file and Authorisation for specific maintenance activity			
Security clearance			
Relevant work procedures			
Compliance with Eskom Construction Safety, Health and Environmental Management – EPC 32-136			
OEM manual			
Daily activity report			
Handing over certificate			

SITE / EQUIPMENT REQUIREMENTS			
Personal Protective Equipment (PPE)			
Tools, equipment, material and consumables as specified on the quotation			
Special tools and relevant equipment			
High pressure cleaner capable of pumping its own water			
220 / 380V supply			
Ladders and scaffolding			
Dry air, pipes and fittings			
Oil spill kit			

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