COMPLIANCE AUDIT REPORT OF MAFUBE MUNICIPALITY

Audit Dates: 27 and 28 November 2012

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DISCLAIMER

Site inspection and information collected from the licensee was used to compile this report. Should this report not be accurate as per the information collected from the licensee, the licensee must in writing within sixty (60) days of receipt of this report advise NERSA about such inaccuracies.

Contents **Page**

EXECUTIVE SUMMARY

On 27 and 28 November 2012, two NERSA employees conducted a compliance audit on Mafube Municipality in Frankfort Free State Province. The objective was to determine the compliance of Mafube Municipality with the legal, financial and technical conditions of the electricity distribution licence.

During the audit Mafube Management highlighted that all electricity related business of Mafube are completely ring fenced from the Municipality and are held separately by a company called Rural Freestate (Pty) Ltd. Mafube Local Municipality has entered into a service level agreement with Rural Freestate (Pty) Ltd in 15 December 2011 hence Rural Freestate (Pty) Ltd is solely responsible for all Mafube's electricity business. In February 2012 Rural Freestate started its activities in Mafube area of supply as per the agreement with the municipality.

In light of this the audit was conducted on the network and systems of Mafube under the custodianship of Rural Freestate (Pty) Ltd. The whole audit process was conducted at Rural Freestate (Pty) Ltd offices. After the audit, the findings were recorded in a draft report and forwarded to the Licensee for comments with regard to the correctness of the findings.

A final report will be sent to the management of Mafube and Rural Freestate (Pty) Ltd after comments have been included. The objective of the final report is to assist the Licensee in identifying possible areas for improvement and to submit a corrective action plan to NERSA to outline a programme which addresses the non-compliances.

This corrective action plan should be submitted to NERSA within 120 days of the receipt of the final report by the Licensee. NERSA will monitor the implementation of this corrective action plan by the Licensee.

There were areas where Mafube complied with the electricity licence conditions. The representatives of Rural Freestate (Pty) Ltd were fully prepared for the audit as the audit team received all the information required for the audit all ready in an audit file before the first session of the audit could start. The questionnaire was also fully completed on the first day of the audit as NERSA had requested, and supporting documents were available. The following findings pertaining to the compliance audit were noted and highlighted to the Licensee:

a) The Protection Relay setting provided is for a wrong substation (Mwanza South).
b) The current disconnection notice is in compliance with the by-laws (Clause 16 paragraph 6 "forthwith" but not in compliance with NRS 047-2 (Paragraph 4.3.7) as it gives the client only 48 hours to pay the outstanding account.

c) The actual areas of supply are not exactly the same as those stated on the licence schedule 1.
d) The power quality management system was installed and in process of being commissioned. This was not yet fully operational at the time of the audit.
e) A sub standard network is prevalent in Tweeling Township largely due to the prevalence of high voltage bundle historically located under the low voltage network.
f) One switch gear at Villiers Substation was not in commission.
g) Housekeeping at Tweeling substation's switch room was not acceptable.
h) No asset management policy submitted and network asset register was not appropriate.
i) Sub standard LV boards in some sub stations.
j) Old silica gels on some transformers with minor oil leaks.
k) Magnefix switches still in use which poses an increased safety hazard and is not ideal.
l) LV and MV network upgrade project was under way.

1. INTRODUCTION

1.1 Overview

The National Energy Regulator of South Africa (NERSA or 'the Energy Regulator') is required to monitor and assess whether the electricity suppliers comply with the conditions of their licence. The Energy Regulator approved a compliance monitoring framework for electricity distributors in 2011, which acts as a guide on how compliance audits and monitoring must be conducted. The framework is also supported by the Electricity Regulation Act, 2006 (Act No. 4 of 2006), Chapter 4 (a) (vii), which states that 'The Regulator must enforce performance and compliance; and take appropriate steps in the case of non-performance'. NERSA conducts the compliance audits on licensed electricity distributors annually.

NERSA regulates the energy industry in accordance with government laws and policies, standards and international best practice in support of sustainable development. The organisation issues licences to electricity distributors and therefore requires audits to be conducted against key licence obligations.

1.2 Audit Objectives

The key objectives of the compliance audit are:

a) to review and evaluate activities of the regulated entities;

b) to determine and ensure compliance with all the licence conditions governing their electricity business operations;
c) to ensure that the quality of service and the quality of supply does not decline; and
d) to inform the Energy Regulator of the quality of service and the quality of supply provided by utilities across the country.

2. METHODOLOGY

A questionnaire that covers all aspects of the distribution licence, key company and network statistics and asset management information was forwarded to Rural Freestate (Pty) Ltd and Mafube Municipality prior to the audit. This was subsequent to a telephone call that informed the Licensee about the audit and followed by the finalisation of the logistics.

On 27 November 2012, the first part of the first session of the audit took place at the Mafube Municipality offices in Frankfort. Introductions were made where the Mafube Mayor welcomed the NERSA delegates and explained that the first session of the audit will be done at Rural Freestate (Pty) Ltd offices after which NERSA made a verbal presentation and thanked the Mayor of Mafube local Municipality and his delegates for the warm welcome and interest shown to NERSA's audit.

At Rural Freestate (Pty) Ltd offices NERSA concluded the verbal presentation by reviewing the audit scope, objectives, methods, procedures and all the communication necessary for the audit. The resources needed and the facilities to be inspected were confirmed. All unclear details were clarified. Rural Freestate (Pty) Ltd also made a projected presentation which gave background and highlighted their challenges and progress since their engagement with Mafube Local Municipality.

Discussions were conducted on the questionnaire and issues on non-compliances were noted and discussed. Evidence on responses to the questionnaire was provided during the deliberation.

After the discussion of the questionnaire, site audits were conducted. The audit team decided to do site inspection on all four towns supplied by Mafube Municipality. The physical plant condition was assessed in order to form a holistic view of the municipality's/licensee's network condition. The audit focused on a sample of substations, overhead lines, mini-substations and pole mounted transformers.

3. AUDIT TEAM & MAFUBE MUNICIPALITY DELEGATES

The audit team members from NERSA were:

Mr Velly Malaza	-	Senior Distribution Compliance Engineer
Mr Vuyelwa Poswa	-	Dispute Resolution Officer

Mafube Municipality and Rural Freestate (Pty) Ltd were represented by:

Mr J Sigasa	-	Mayor Mafube Local Municipality
Ms J M Moloi	-	Speaker Mafube Local Municipality
Mr Madise Mosia	-	EXCO Member Mafube Local Municipality
Mr N Molefe	-	CFO Mafube Local Municipality
Mr C Bosch	-	Engineer Rural Freestate
Ms G Mokoena	-	Admin Tech Manager Rural Freestate

4. GENERAL INFORMATION ON MAFUBE LOCAL MUNICIPALITY

Mafube Local Municipality is the electricity distribution licence holder in Frankfort town, in the Free State Province. This is a small Municipality with only four intake bulk point and has a total installed capacity of 44MVA. It has 8948 customers, which are categorised as follows: 8123 prepaid domestic; 287 domestic credit meters; 287 commercial and 23 industrial customers with only 3 971.36 km² supply area.

5. AUDIT FINDINGS

During the site and office audit, a factual account of what was observed was recorded and discussed.

5.1 Key Utility Statistics

5.1.1 Departmental structure

A departmental structure was submitted to the audit team and discussed during the first session of the audit. It was observed on the structure provided that there were only three vacant positions. The two vacant positions were for overhead live line and the one vacant position for maintenance. On deliberation on the organisational structure it was mentioned that although there are vacant positions the current staff available is adequate to do all the necessary work as the staff is switched between areas (towns). Also for live line works it was mentioned that there is currently one personnel available to do the work as and when required.

5.1.2 Training

There is an internal formal training programme for the staff in Rural Freestate (Pty) Ltd a list of courses done by Rural Freestate (Pty) Ltd on its personnel was also provided.

5.1.3 Health and safety

There were Responsible Person appointed as required by the Operational Health and Safety Act and safety meetings were conducted as per the requirement of the Act. A copy of safety meeting minutes was submitted and this meeting took place in 13 November 2012.

5.1.4 Areas of supply

According to the licence issued by NERSA, Mafube Local Municipality supplies electricity to:

- Cornelia TLC
- Frankfort TLC
- Oranjeville TLC
- Riemland TLC
- Tweeling TLC
- Vaaldam RLC
- Villiers TLC

However it was mentioned during the audit that Mafube Local Municipality does not supplies electricity to Oranjeville TLC, Riemland TLC and Vaaldam RLC.
This does not correspond with the areas of supply as listed in Schedule 1 of the Mafube Local Municipality licence. The representatives of the licensee were advised of the process to follow to get the licence's schedule 1 rectified.

5.1.5 Financial conditions

5.1.5.1 Separate Electricity Distribution Affairs

The electricity affairs of Mafube Local Municipality are fully ring-fenced.

5.1.5.2 Tariff application and approval process

NERSA approved the 2012/13 tariff application for Mafube Local Municipality and an approval letter for electricity tariffs for 1 July 2012 – 30 June 2013 was shown to the audit team. During the audit it was observed that Mafube Municipality implemented the tariffs exactly as approved by NERSA.

5.1.5.3 Payment of bulk supplier

The payment to Eskom's account is up to date. An example of an Eskom current account bill was shown to the audit team and this reflected that an amount of R 3, 397, 679.92 currently due. In addition to this bill a proof of payment for the previous account was also shown to the team and paid before the due date. The account statement reflected no arrears on previous months. The licensee is in compliance with the payments of its bulk account.

5.1.5.4 Promulgation of tariffs

It was mentioned that there is a public participation process done by the licensee in a form of Ward Committee meetings. This is done in a form of workshops a presentation to one of these workshops was submitted to the audit team. In addition to the workshops, adverts are posted on local news papers, and postings on Rural Freestate's website also community liaison officers are used to engage the customers on the proposed tariffs and documents can be viewed and are obtainable at the public facilities (Municipality buildings) and Rural Freestate offices. The approved tariffs and letter of approval from NERSA are posted on the Rural Freestate (Pty) Ltd's website. It was recommended that the letter and approved tariffs should also be posted on the Mafube Local Municipality's website.

5.1.5.5 Budget versus actual spending on maintenance costs

Table 1: Maintenance budget vs. actual figures

Maintenance budget versus actual figures		
Year	Budgeted	Actual
2008/2009		
2009/2010		
2010/20011		
2011/2012		
2012/2013 (October)	R 22,550,000	R 40,377,109

The figures for the past 5 years were not available as Rural Freestate (Pty) Ltd took custodianship of Mafube electricity business in February 2012. Although the budgeted figure was R 22.55 million, the actual expenditure has gone beyond the budgeted amount by 179% due to the poorer than expected state of the network when Rural Freestate started operating in February 2012. The above budget expenditure is due to the refurbishment and upgrade done to date and this will have positive result in terms of network reliability and condition.

5.1.5.6 Prioritisation of projects

The licensee indicated that at the time of the audit, projects prioritisation has been driven primarily by safety of personnel, the public and the plant as well as obsoleteness of plant equipment. It was explained that this was due to the bad condition of the network when Rural Freestate (Pty) Ltd took custodianship of the network. It was mentioned that going forward once the network is fully normalised, project prioritisation will be revised accordingly to address up keep of network, expansion of network according to licensee's growth and risk management principles will be applied taking into consideration the municipality's integrated development plan (IDP). Rural Freestate has also highlighted the fact that Frankfort and Villiers have reached capacity and therefore Eskom's supply constraints has resulted in no further growth until approximately 2016/2017 financial year as per Eskom's planning department projections.

5.1.5.7 Stores

There were stores available for electricity equipment at the time of the audit. The stores were very well replenished in terms of spares for both major plant equipments like spare transformers, mini sub stations, switches, MV underground cables, MV overhead cables and minor network ancillaries like cable joints, dropout fuses miniature circuit breakers, surge arrestors, insulators and other critical spares for emergency purposes.

Spares in stores mini sub, transformers, bundle OH conductors and other ancillaries

5.1.5.8 Contract and project management

There is a Specialist Services unit which deals with contract and project management in collaboration with the planning department within Rural Freestate (Pty) Ltd. This manages the contractual terms in a project, the purchasing and supply of project materials and the control of project execution.

5.2 Key Network Statistics and Strategic Planning

5.2.1 Network information

The geographical supply area of Mafube Local Municipality is 3971.36km2. There are four bulk Eskom intake point and the installed capacity for the Mafube Local Municipality area of supply amounts to 44 MVA with a maximum demand of 16.16 MVA.

Network cable length is estimated to be as follows:

MV underground cable	≈ 17,52km
MV OHL distribution	≈ 68, 77km
LV Under Ground	≈ 2, 935km
LV OHL	≈ 117,82km

Average age of the network was not known at the time of the audit as Rural Freestate (Pty) Ltd took custodianship of the network in February 2012. This is to be assed going forward as this is going to help the licensee to develop a proper asset register as per Generally Recognised Accounting Practice (GRAP) requirements.

Older than 50 years	≈ unknown
Between 30–50 years	≈ unknown
Between 10–30 years	≈ unknown
Less than 10 years	≈ unknown

Number of Mafube Local Municipality Customers is recorded as follows:

23	Industrial
287	Commercial
515	Domestic Credit Meter and
8123	Domestic Pre-payment

5.2.2 Communication with Customers

There was customer education forum action plan available at the time of the audit. It was explained that to enhance customer education Rural Freestate (Pty) Ltd undergoes school campaigns and distribute educational pamphlets on critical aspects of electricity like safety, the proper and efficient usage of electricity. Samples of the customer education pamphlets were submitted to the audit team and these were very much detailed and easy to understand from a customer point of view and will implemented fully in 2013. These educations were further conducted in councillor's meetings. The licensee indicated that these were also made available for collection by customers at the municipality offices and the offices of Rural Freestate (Pty) Ltd.

5.2.3 Load forecasting

Load forecasting for all four towns was presented to the audit team. The load forecast indicated that there would be a steady growth in load demand for all four towns expected. The Notified Maximum Demand (NMD) is however on the verge of being exceeded. The officials indicated that there was no new capacity available from Eskom before 2016/2017. This is a grave concern for Rural Freestate as it impacts the community directly.

5.2.4 Risk assessment and strategies

A risk assessment and risk mitigation actions have been done by the licensee as during the assessment the licensee observed that the NMD at Villiers needed and increase and this was done accordingly and a proposal for the risks identified in Frankfort is under discussion with their supplier.

5.2.5 Demand Side Management (DSM)

This is in the process of being implemented; the licensee indicated that they are planning to install power factor correction equipment in one of their intake point in Villiers Main substation to decrease their NMD. The introduction of new TOU tariffs has also significantly reduced the NMD when compared to previous years' demand.

5.2.6 Condition inspections of the network

The licensee has done most of inspections that need to be done on its networks. This was evidenced by the number of projects that the license was doing at the time of the audit to address the deficiency that were observed during those inspections. An example of a condition assessment

report done on MV and LV distribution boards, switchgear, transformers and overhead lines with photos taken during the inspection was presented to the audit team. The licensee complied with the licence condition to inspect and maintain network.

5.3 Asset Management and Practices

5.3.1 Asset register

An asset management policy for the electricity business of the municipality was not presented to the audit team although in the audit file it was indicated or referenced to be in diver 3.1.1 and 3.1.3 it was not in the said dividers of the file. The assets were also not linked to GIS by the time of the audit however it was fully captured on CAD (Microstation).

Single line diagrams were provided as an example of one page of an asset register. This could not be accepted as no vital information like serial numbers, date of purchase, date of commission and other critical information of the assets from an asset management point of view were available on the single line diagrams. A proper asset register needs to be developed going forward preferably on GIS or similar.

5.3.2 Network diagrams

Mafube has single line diagrams. It was noticed that the single line diagrams were up-to-date and have proper legends to explain signs and symbols. These are internally updated by the drawing office in Rural Freestate (Pty) Ltd.

5.3.3 Maintenance plans/policies:

An excel format maintenance plan was presented to the audit team. This maintenance plan covers all plant equipments e.g. transformers, switchgear, substations and associated components. This plan also included the replacement plan of obsolete plant equipment identified during the network inspections. The plan is detailed in terms of what work must be done and how many is planned to be done, however it was not clear on the actual figures what was done as this was not populated on the correct column in the spread sheet. The licensee is commended for the plan but attention to tract what has been done to date must be implemented to track progress against plan to be able to point out any backlog.

5.4 Quality of Service

5.4.1 Monitor Quality of Service

The Licensee monitors the Quality of Service as required by the NRS 047 standard hence it complies with this licence condition with regard to the following:

A Meter reading

It was reported that meters are read on a monthly basis either remotely or by handhelds units and where there is no access, estimates are made based on historical consumption. Installations with remote metering were also observed on site.

B Billing/customer account

The customer accounts that were presented to the Audit Team contained all the information as required by the NRS 047 standard.

C Customer account queries

Account queries are handled by the Customer Services Department. During the deliberation it was mentioned that there are three ways to deal with customer queries or complaints. A customer may lodge a complaint or query via an email, via a twenty four hour telephone line (share call number) and also by means of a face to face contact by visiting the customer services office in Frankfort or in their satellite offices in the three other towns.

In addition to this the licensee has an internet facility for customers with internet to log in and review their accounts. When the licensee is made aware of the query by means of a telephone, the customer service official record the query with a reference number (Issue number) and the system develop an electronic job card. The official electronically issues the job card to a technician (user) for action. This process records the time the query/fault is received, issued to user and the time it was closed. Records of these are kept for NERSA reporting purposes.

D Payment of accounts

Customer account payments as well as the payment rate are monitored on a monthly basis. Final notices are issued and accounts in arrears are issued with a disconnection notice.

E Payment venues

Accounts are payable by any Electronic Funds Transfer (EFT) facility or by cash deposit in a bank on the account shown in the customer bill statement.

F Meter auditing and calibration

It was mentioned that regular meter audits are conducted by the internal metering personnel a proof of some meter commissioning certificate done by the licensee was presented to the audit team.

G Disconnections

Disconnections are done and implemented by the licensee. A notice for disconnection was submitted to the audit team and this was found to be not according to NRS 047 as it does not give the customer an opportunity to address the arrears as it only allows the customer 48 hours to address the matter before the actual disconnection takes place. The disconnection process is in accordance to the by-laws Clause 16 sub paragraph 6. Mafube has to revise the by-laws for NRS 047 to be adopted.

H Reconnections

Reconnections are done by the licensee once proof of payment has been submitted to customer services which are then submitted to the technical services for execution. It was mentioned that this is done immediately once such proof is obtained.

5.5 Quality of Supply (QoS)

5.5.1 Formal power quality management system

Portions of the power quality management system were demonstrated but due to the fact that the system was not yet fully commissioned, the full quality management system could not be fully demonstrated. Rural Freestate reported that the commissioning should be completed in 2013.

5.5.2 Monitoring of QoS

Hardware was installed. Commissioning and handover of full system still to be done.

5.5.3 QoS Contracts

There were no QoS contracts.

5.5.4 Emergency plan

The emergency plan according to NRS 048-9 is in place. Due to the size of the load of Mafube Local Municipality it was mentioned that emergency on network due to load constraints (load curtailment and load shedding) are covered and implemented by Eskom on behalf of Mafube Local Municipality.

5.6 Network Operation and Information Technology

5.6.1 Operation control system

There is control centre at Mafube which is operating manual not on SCADA yet.

5.6.2 Post-mortem incident reviews

Post mortem incident reviews are done. An example of a line trip was submitted to the audit team where investigations were conducted to find out the root cause of the trip. The result of the investigation led to a recommendation to implement routine line patrols to prevent recurrence from similar cause.

5.6.3 IT department

Rural Freestate (Pty) Ltd has an IT section to service all their IT equipments and requirements.

6. PLANT CONDITION

Sample condition assessments were conducted on electrical assets in substations, mini-substations, pole mounted transformers, switching substations and overhead lines to gain an understanding of the condition of the Licensee's assets or electrical network.

6.1 Substations

There are four intake points in the Mafube Local Municipality network. The network is fairly small as it covers four small towns in the Free State Province.

6.1.1. Frankfort Main Substation

In this intake point Mafube Local Municipality is supplied by Eskom on an 88/11kV step down substation. The licensee only owns the indoor switchgear in the switch room. The indoor switchgear is made up of Alstom Vacuum

6.6kV Switchgear. The entire indoor switchgear was in good condition and well maintained. All the panels were properly labelled and designated both in the front and back. Panel indicators were functioning properly.

New sf6 Indoor breakers in good condition

Mafube officials with interest on their plant

The lights in the switch room were properly working. In addition to this an emergency light was also in place and functional.

The Local transformer although old (1963) appeared to be in a good condition as no oil leak signs were observed. The silica gel of the transformer was in good condition. Bushings and terminations were in good condition and the earths on the transformer were properly done and intact. The transformer oils levels were acceptable however it was mentioned that this transformer is on a planned maintenance to be done in January 2013.

Local transformer old but was in good condition.

The battery charger was in good working condition and indicators functional. The batteries levels were low need top up as they were below the maximum levels. Battery terminals were in good condition no signs of corrosion or discharge on the terminals.

Battery charger in good condition with low battery levels

The fire fighting equipments were serviced and in good condition as the fire extinguisher indicated a service date of 04/04/2012 and the next service is due in 2013. In addition to the fire extinguisher there was also a fire bucket in a designated area. The general building condition and housekeeping of the switch room was good. Single line diagram, safety and first aid signs were in place. A sign of termites' infestation was noticed and this needs to be treated immediately before it invades the building.

6.1.2. Beckwith Switch Station (Substation FSB2)

This switch station consists of the old magnefix switch housed in one room with the local transformer and the low voltage (LV) board. This makes switching dangerous on load condition hence switching has to be done up stream with an impact on other unaffected customers should work need to be done in this switch station. The officials mentioned that an order of new 3T switch has been placed and they are waiting delivery in the middle of December 2012 and this will be replaced in January 2013 under the upgrade plan. The LV miniature circuit breaker (MCB) are not housed and mounted in a proper LV board/cabinet however the cables were properly labelled and designated.

Old magenfix switch LV board with MCB mounted against wall on a frame

The Local transformer appeared to be in a well maintained condition as no oil leak signs were observed. The silica gel of the transformer was in good condition. Bushings and terminations were in good condition and the transformer earths were properly done and intact.

Transformer in good condition

The fire fighting equipments were in their designated area, serviced and in good condition as the fire extinguisher indicated a service date of March 2012 and the next service is due in 2013. The general building condition and housekeeping of the switch room was good.

6.1.3. Gordon Switch Station (Substation FSB7)

The danger and safety signage on the door were available and in good condition for public warning and safety. This switch station was upgraded from the old magnefix switch to the new compact T3 switch. During the upgrade the T3 switch was relocated outside the building to allow space and safety during operation. The switch is properly earthed, designated and locked with a pad lock to prevent unauthorised operation. In addition to this protection it is well fenced with a palisade having warning sign to the public.

New T3 switch on cement plinth inside barricade with warning sign

The Local transformer room showed signs of oil contamination from a previous faulty transformer and this needs to be remedied. The silica gel was also in a bad condition need replacement. Transformer earths, bushings and terminations were intact and in good condition.

Old silica Gel

The LV miniature circuit breaker (MCB) are housed and mounted in a proper LV board/cabinet and were properly labelled and designated. The LV

transformer Main Circuit Breaker (MCB) was mounted against the wall this must also be housed in a proper panel.

MCB mounted against the wall next to proper panel with designated LV MCB

The general building condition and housekeeping of the switch room was good and locked with proper lighting.

6.1.4. Riool Switch Station (Substation FSB8)

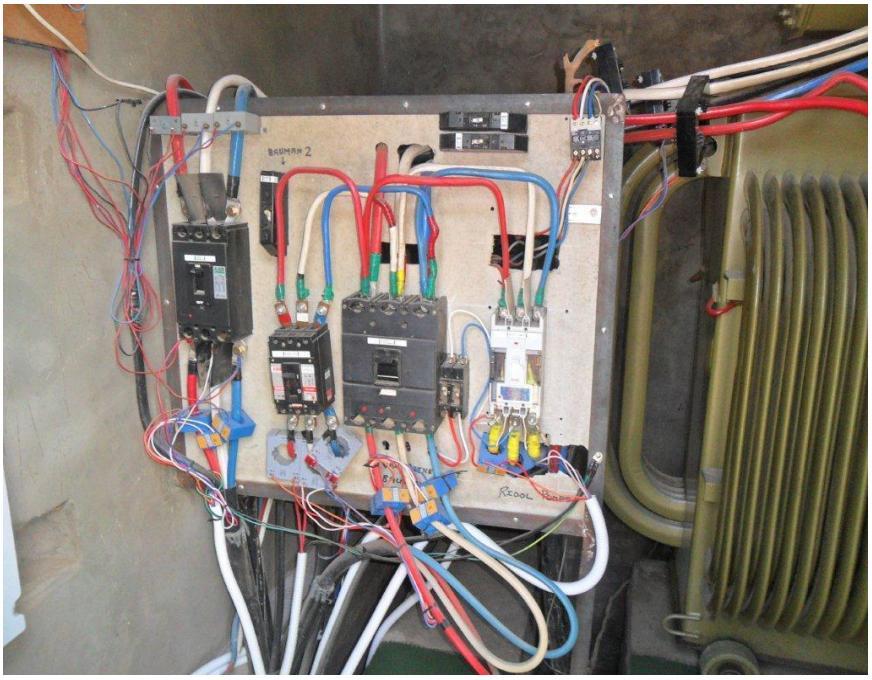
There were danger and safety signage available and displayed at the door of the switching station. The signage and warning signs were in good condition for public warning and safety. A portion of this switch station was upgraded from the old magnefix switch to the new compact T3 compact switch. The T3 switch is properly earthed, designated and locked with a pad lock to prevent unauthorised operation.

New T3 switch in good condition

The Local transformer appeared to be in a well maintained condition as no oil leak signs were observed. The silica gel of the transformer was in good condition. Bushings and terminations were in good condition and the transformer earths were properly done and intact.

Transformer and silica gel in good condition

The LV miniature circuit breaker (MCB) were not housed and mounted in a proper LV board/cabinet although labelled and designated. These LV MCBs need to be put into a proper LV board/cabinet.



LV MCBs mounted on a frame.

The fire fighting equipments were new and located in their designated area. The general building condition and housekeeping of the switch room was good.

6.1.5. Samcross Live Chamber (Substation FSB6)

There were danger and safety signage available and displayed at the door of the switching station. The signage and warning signs were in good condition for public warning and safety. The switch station was upgraded from the old magnefix switch to the new compact T3 switch. The T3 switch is properly earthed, designated and locked with a pad lock to prevent unauthorised operation.

New T3 switch in good condition

The Local transformer appeared to be in good condition as no oil leak signs were observed although it was last serviced in 2009. The transformer oil was in an acceptable level. The silica gel of the transformer was in an acceptable condition. Bushings and terminations were in good condition and the transformer earths were properly done and intact.

Transformer and silica gel in good condition

The LV miniature circuit breaker (MCB) were housed and mounted in a proper LV board/cabinet with proper labels and designations. The LV board/cabinet is still in good condition.

LV MCBs cabinet in good condition and properly labelled.

The fire fighting equipments were in good condition and located in their designated area. The general building condition and housekeeping of the switch room was good. An emergency light was in place and functional.

6.1.6. Rosenberg Switching Station (Substation FLL2)

There were danger and safety signage available and displayed at the door of the switching station. The signage and warning signs were in good condition for public warning and safety. The switch station was upgraded from the old magnefix switch to the new compact T3 switch. The T3 switch is properly earthed, designated and locked with a pad lock to prevent unauthorised operation.

Switching station with warning signs to public properly locked

The Local transformer was not in good condition as signs of oil leaks were observed however the transformer oil was in an acceptable level. The silica gel of the transformer was in bad condition need replacement. Bushings and terminations were in good condition and the transformer earths were properly done and intact.

Transformer and silica gel in good condition

The LV miniature circuit breakers (MCB) were mounted against the wall and some were housed and mounted in processed wood chipboard a material that catches fire easy. The MCB against the wall were not labelled or designated proper. The LV board/cabinet need to be replaced and all MCBs must be housed in a proper LV panel.

LV MCBs board made of chipboard and other MCB against the wall.

The fire fighting equipments were in good condition and located in their designated area. The general building condition and housekeeping of the switch room was good with adequate ventilation. An emergency light was in place and functional.

6.1.7. Cornelia Main Supply (Cornelia Main Sub)

Cornelia is feed from Eskom through a Current Voltage combination transformer (CTVT). The line supplying the unit was upgraded from 11/22Kv and new pole structures were installed on the line during the upgrade. The CTVT unit was properly secured on an HT pole on top of a proper steel cross arm. The unit was properly earthed, terminations properly done. Jumpers and insulators on the structures were intact and properly done. Surge arrestors were in place and in good condition. The line was protected by means of an auto recloser (ARC) for immediate/ automatic restoration of power under fault conditions. The recloser was also in a good condition in the same state as the CTVT unit and well barricaded by means of a palisade fence.

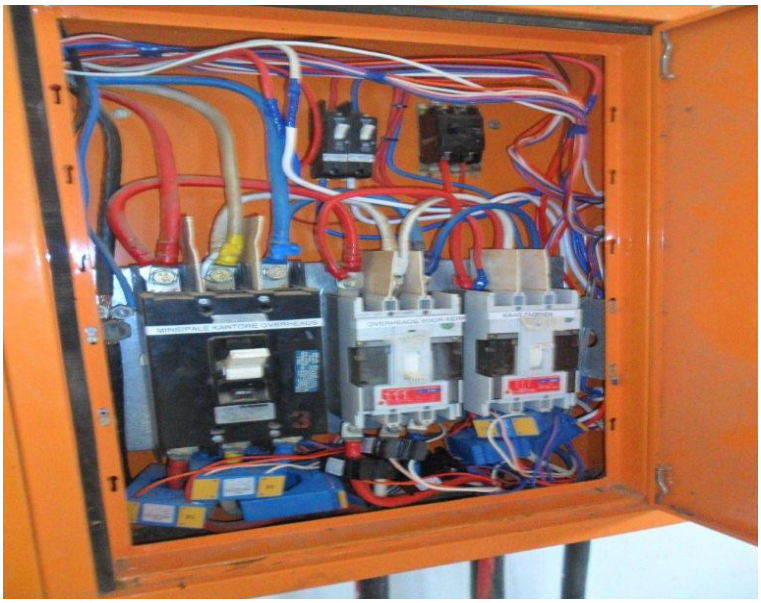
CTVT unit with an Auto Recloser at Cornelia.

6.1.8. Cornelia Main Supply (Cornelia Main Sub)

There were danger and safety signage available and displayed at the door of the main substation. The signage and warning signs were in good condition for public warning and safety. The old local transformer in the station was replaced with a new properly barricaded 315kVA transformer. This transformer was in good condition as no signs of oil leaks were observed. The surge arrestors were in good condition and silica gel of the transformer was also in good condition. Bushings and terminations were new in good condition and the transformer earths were properly done and intact.

New transformer and silica gel in good condition with surge arrestors

The LV miniature circuit breakers (MCB) were mounted against the wall and some were housed and mounted in processed wood chipboard a material that catches fire easy. The MCB against the wall were not labelled or designated proper. The LV board/cabinet need to be replaced and all MCBs must be housed in a proper LV panel.

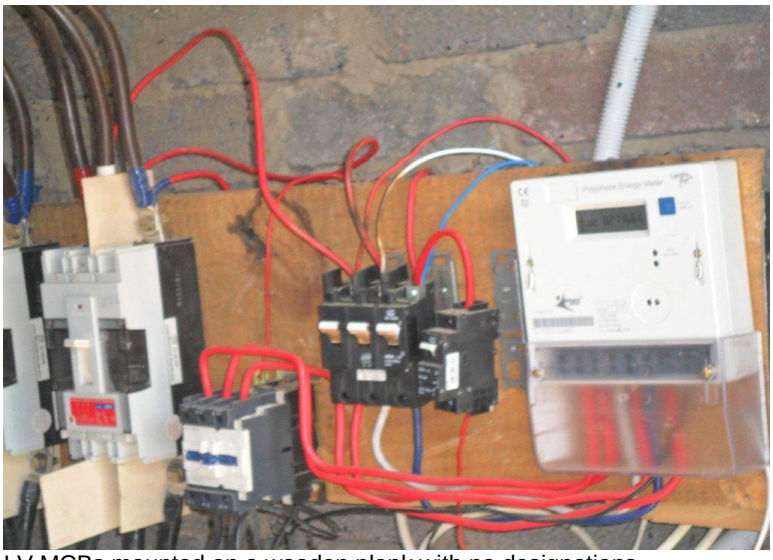


Proper LV MCBs cabinet in good condition and properly labelled.

The fire fighting equipments were in good condition and located in their designated area. The general building condition and housekeeping of the switch room was good with adequate ventilation. An emergency light was in place and functional.

6.1.9. Rethabile Sub

The signage and warning signs were in good condition for public warning and safety. In this substation LV MCBs were exposed and attached on a wooden plank instead of a proper LV cabinet. Also the MCBs were not properly labelled and designated. This setup needs replacement urgently as it is substandard and a potential hazard.



LV MCBs mounted on a wooden plank with no designations

The transformer inside the room appeared to be in good condition however it was not on a proper plinth. There were no signs of oil leaks observed. Bushings and terminations were in an acceptable condition and the transformer earths were properly done and intact.

Local transformer in good condition

6.1.10. Meule Substation (Sub2)

There were danger and safety signage available and displayed at the door of the substation. The signage and warning signs were in good condition for public warning and safety. The switch station was upgraded from the old magnefix switch to the new compact T3 switch. The T3 switch was properly earthed, designated and locked with a pad lock to prevent unauthorised operation.

Switching station with warning signs to public properly locked

The Local transformer's oil was in an acceptable level however the transformer was not in good condition as the LV terminal plate cover was missing and opened. The silica gel of the transformer was in bad condition need replacement. The HV bushings and all terminations were in good condition and the transformer earths were properly done and intact. Proper cable trench and trench covers were in place and in good condition.


Transformer and silica gel in good condition

The LV miniature circuit breakers (MCB) were housed and mounted on processed wooden chipboard a material that catches fire with ease. These MCBs

were also not properly labelled. The LV board/cabinet need to be replaced and all MCBs must be housed in a proper LV panel and labelled accordingly.

LV MCBs board made of chipboard and not properly labelled.

The fire fighting equipments with an additional fire bucket were in good condition and located in their designated area. The general building condition and housekeeping of the switch room was good with adequate ventilation.

6.1.11. Tweeling Substation

In this substation the licensee only owns the indoor switchgear the HV yard belongs to Eskom. There were danger and safety signage available and displayed at the door of the substation. The signage and warning signs were in good condition for public warning and safety. Tweeling substation is a 22/11kV substation with Hawker Siddeley Indoor oil breakers.

These breakers were in good working condition and well maintained. There were no signs of oil leaks and all panels were properly labelled both in front and at the back. All panel indicators were in working conditions as breaker status could be read on the breakers. According to the officials the protection relays grading was just concluded and the relays were in good working condition.

Indoor oil breaker in good condition with and compact T3 switch

Fire extinguisher was in its designated area and still valid. The general condition of the building and housekeeping in the switch room was not good as cable trenches were opened there were no trench covers also the room was used as a store room as drums and containers of oil were lying in the room. As this was pointed out the officials indicated that the container outside is in a process to be established and this will serve as the stores and site office. It was also mentioned that the building will be in a process to be cleaned once the store room is fully commissioned.

Open cable trenches container in a process to be made a store room

6.1.12. Villiers Substation

In this substation the licensee only owns the indoor switchgear the HV yard belongs to Eskom. There were danger and safety signage available and displayed at the door of the substation. The signage and warning signs were in good condition for public warning and safety. Villiers substation is an 88/11kV substation with Hawker Siddeley Indoor oil breakers.

These breakers were in good working condition and well maintained. There were no signs of neglect. One of the breakers was not in service due to its parts being used to fix another breaker that experienced a fault in the past. This breaker must be repaired urgently as there is currently no spare breaker available. All panel indicators were in working conditions as breaker status could be read on the breakers.

Indoor breaker in good condition with

Fire extinguisher was in its designated area and still valid. The general condition of the building and housekeeping in the switch room was in good. It was observed that the room is very much small and confined as a result doing operation in this room is a challenge. A plan needs to be put in place to alleviate this challenge. According to the officials, power factor correction project in this substation is planned in order to improve the licensee's NMD.

The backup system was in good working condition. The battery charger was well maintained and all indicators were working. The solid state/ dry cell type batteries were also properly placed inside the charger.

Battery charger with dry cells inside all in good condition

6.2 Overhead Network Condition

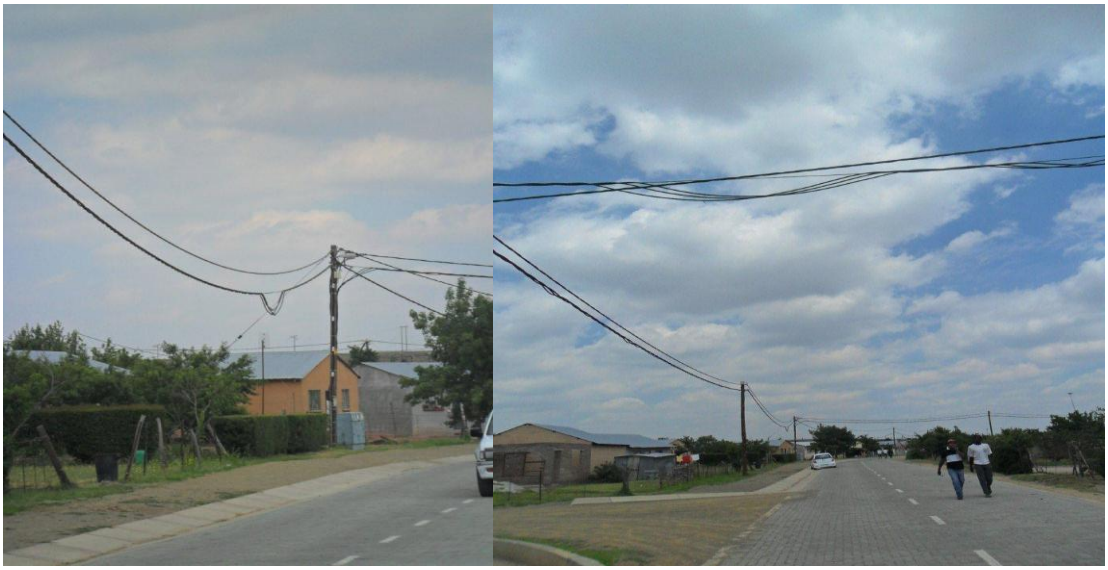
A sample of overhead lines was inspected on all four towns of Mafube Local Municipality. In all four towns servitude management was well maintained there were no trees in contact with the lines. Both LV and MV overhead lines were inspected.

In Villiers there was a problem with trees coming into contact with lines and a project was already far underway to cut the trees under the lines and to also upgrade and convert the LV line from three phase bare wire LV lines into bundle conductors LV lines in order to reduce the risk of trees causing faults on the lines. The project was still in progress about 45% of the network was upgraded at the time of the audit. Proper stringing and tensioning was done on the lines. As the MV and LV lines shared the same servitude proper and correct clearances were maintained between the MV and LV lines. Also some new poles were installed and connected to a portion of the MV line where old poles were removed. Also jumpers, insulators and terminations were installed accordingly.

LV line upgraded with new poles & bundle conductor correct clearances between MV and LV line

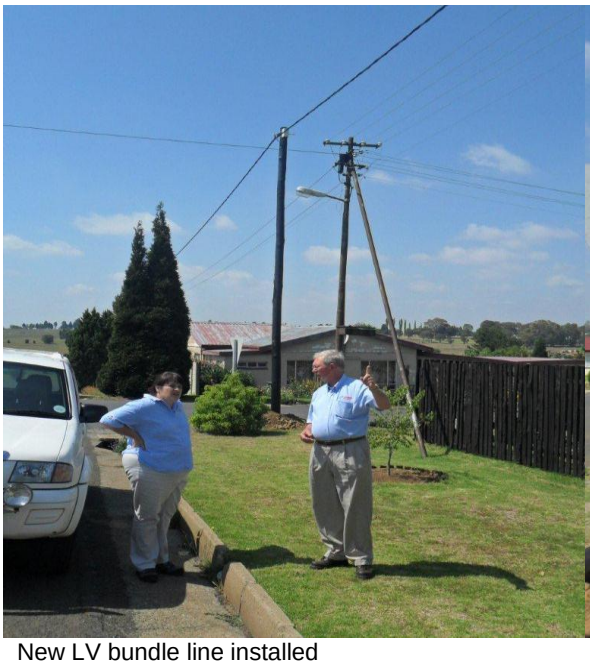
At Tweeling Township the network was inspected and this was found to be a sub standard network. This is made up of twisted bundle conductors where an MV line and an LV line share the same pole structure which is normal. The only problem found to be prevalent on this network was the situation where the MV line was running below the LV line.

Also the clearance between the MV and LV lines were found to be non standard as they were very close to each other. This necessitate an outage even if a minor work has to be done on the LV line since the LV line is running above the MV line as a result other customers tends to be affected unnecessary due to outages and this will have a negative impact on the availability of continuous supply to customers i.e. system availability duration index (SAIDI). This is already part of Rural Freestate's normalisation plan. In some areas the conductors were falling off the anchor wire.



MV line above LV line no adequate clearance in some places conductors falling off the anchor wire.

At Frankfort some old overhead LV lines were undergoing an upgrade during the audit. The old steel poles were being replaced with new wooden poles, the three phase bare wire copper conductors were being replaced with bundle conductors and line spacing was also done to prevent phase clashing under wind condition as this was a problem in some portion of the network. The officials mentioned that the project is still carrying on as some poles were observed where the cable work was still to be done.



New LV bundle line installed

LV poles installed in a process to upgrade line

A sample of pole mounted transformers was inspected. These were only in Villiers, Tweeling Township and Cornelia. The entire pole mounted transformers inspected were found to be in good condition. The earthing was intact. There were no oil leaks, transformer bushings and surge arrestors were in good conditions. The jumpers, insulators, cable terminations and insulations were properly done. The condition was generally good.

Pole transformers at Villiers in good condition with coms

Pole transformer in Tweeling in good condition

6.4 Underground Network Condition

A sample of mini substations (MSS) was inspected at Villiers and the mini substations inspected were found to be in an acceptable condition. All mini substations were secured and put on proper concrete plinths. The inspected MSS were properly locked and well earthed. Only small vegetation growing next to the water works MSS was observed and this need to be attended to before it overgrow the MSS. The MV compartment of MSS 4 was properly designated while the LV side was not properly done to designate cables. This needs to be corrected to ensure that the correct circuit is switched off should a need arise. In addition to this, warning and safety signage was fading and need replacement.

Mini substation on proper plinth


MSS with proper locks

7. CONCLUSIONS

Mafube Local Municipality is doing well in terms of turning around their electricity business and network condition. This has been done by the involvement of Rural Freestate (Pty) Ltd and evidenced by the work done at the time of the audit. The service provider had only eight months in Mafube at the time of the audit however the work that has been done was impressive. Although Mafube has room for improvement as highlighted in this report including some license amendments that are required, it is clear that it is in the right direction to fully comply with their licence conditions should all the projects that were being implemented at the time of the audit are fully executed.

8. RECOMMENDATIONS

The audit team noted that the Licensee was fully prepared for the audit as all the critical documents required were already available on the first day of the audit.

Taking into consideration the findings as indicated in the Executive Summary, the following recommendations should be considered by Mafube Local Municipality to rectify the non-compliances:

a) An application to amend schedule 1 of the licence to correct the areas of supply must be lodge with NERSA.
b) Maintenance policy must be developed.
c) Customer disconnection notice must be in line with NRS 047 requirement.
d) Asset management policy and proper asset register must be developed as per GRAP.
e) Tweeling sub's switch room must be kept tidy.
f) The Tweeling normalization plan as presented must be executed.
g) The one faulty Switch gear at Villiers substation must be refurbished in order to have spare switch for emergency.
h) The maintenance and refurbishment plan available must be updated to be able to monitor or keep track of what is done and what is outstanding.
i) Sub standard LV boards must be replaced with proper LV boards.
j) Old silica gels must be replaced.
k) The upgrade projects of the MV and LV network must be pursued to conclusion.
l) Power Quality systems must be fully commissioned.

9. THE WAY FORWARD

In response to the auditors' findings, NERSA sent a draft report to the Licensee (Mafube Local Municipality and Rural Freestate (Pty) Ltd) to comment within 60 days of the date of receipt of the draft report. These management comments were received and are included in this report, as a result the report is now considered final. NERSA requests the Licensee to outline any remedial/corrective action plan that the licensee proposes to undertake within 120 days of receipt of this final report. Once NERSA agrees with the corrective action plan from Mafube Local Municipality, a monitoring process shall be instituted to enforce the implementation of the corrective action plan.

All communication should be forwarded to:

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