Consolidated Report on the Audit Findings of the Electricity Generation Industry Compliance Audits Conducted in 2013

Audit date: Year 2013

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ABBREVIATIONS

EAF	Energy Availability Factor
GCR	Grid Code Requirement
HV	High Voltage
MTPPP	Medium Term Power Purchase Programme
MFMA	Municipal Finance Management Act
OEM	Original Equipment Manufacturer
PPA	Power Purchase Agreement
SAGC	South African Grid Code
SAP	System Application and Production
UAGS	Unplanned Automatic Grid Separations
UCLF	Unplanned Capability Loss Factor
PCLF	Planned Capability Loss Factor

DEFINITIONS

Embedded Generator (as defined in the South African Grid Code)
A legal entity that operates a unit, other than a co-generator, that is not connected to the Transmission System.

Generator (as defined in the South African Grid Code)
A legal entity licensed to engage in the production of electricity through a unit or power station.

Grid Code (as defined in the South African Grid Code)
The "South African Grid Code", which consists of the following documents, as approved by NERSA and updated from time to time by the Secretariat.

- *Preamble*
- *Governance Code*
- *Network Code*
- *System Operation Code*
- *Metering Code*
- *Tariff Code*
- *Information Exchange Code*

Licensee (in this document)
The Municipality: City of Tshwane or City of Cape Town or Nelson Mandela Bay Municipality.

Participant (as defined in the South African Grid Code)
A legal entity registered with or licensed by the NERSA in terms of the Electricity Act, and as listed in the Governance Code. Participants are defined as the following entities:

- *Generators with power stations where the total installed generating capacity is greater than 50MVA or any unit where the installed generating capacity is greater than 20 MVA, and who participates in the wholesale electricity market.*
- *Generators with power stations connected to the transmission system.*
- *Generators providing ancillary services for system operation purposes.*
- *Distributors connected to the transmission system.*
- *End-use customers connected to the transmission system, or their respective distributor acting on their behalf.*
- *A retailer or other wholesale market participant required to contract for the use of the transmission system.*
- *Transmission network service providers.*
- *The System Operator.*
- *Other participants in the ancillary services market; e.g. persons with interruptible loads.*
- *The Market Operator.*

EXECUTIVE SUMMARY

The Electricity Regulation Act, 2006 (Act No 4 of 2006) ('the Act'), stipulates that the Regulator must enforce performance, compliance and take appropriate steps in the case of non-performance.

Pursuant to Section 4(a) (vii) of the Act, all licensed entities are subject to an audit for compliance with licence conditions imposed by the Energy Regulator. The audit objectives are to assess compliance with applicable regulatory requirements, validate evidence of self-reported non-compliances, document the Licensee's compliance level and plans, and monitor the implementation of corrective action plans.

The Energy Regulator conducted compliance audits for the licensees listed in **Table 1** below:

Table 1: Names of licensees audited and audit dates

Licensee	Power Station Name	Status of the Power Station	Audit Date
City of Tshwane Metropolitan Municipality	Pretoria West Power Station (coal)	Operational but on forced outage	28 to 29 May 2013
	Pretoria West Power Station (gas turbine)	Decommissioned and dismantled	28 May 2013
	Rooiwal Power Station	Operational but on forced outage	30 to 31 May 2013
City of Cape Town Metropolitan Municipality	Steenbras Power Station	Operational	26 to 27 August 2013
	Athlone Power Station (coal)	Decommissioned	26 August 2013
	Athlone Gas Turbine	Operational	28 August 2013
	Roggebaai Gas Turbine	Operational	28 August 2013
Nelson Mandela Bay Metropolitan Municipality	Mount Rd Gas Turbine	Operational	11 November 2013
	Swartkops Power Station	Decommissioned	11 November 2013

The twofold audit included a compliance assessment and plant inspection. The licensees are in compliance with most of their licence conditions. **Table 2a and 2b** below represents a snap-shot of the compliance status common to the licensees audited:

Table 2a: A snap-shot of compliances identified

Section of this report	Description of compliance
7.1 Compliance with the Electricity Generation Licence	All licensees maintained the generation process of the generation stations as at first commissioning.
7.4 Compliance with the Network Code	All licensees comply with minimum protection requirements of the code.
7.5 Compliance with the Distribution System Operating Code	All licensees comply with the minimum requirements of the code in that their generation stations are equipped with systems that will ensure their safe operation and minimum disturbance to the network.

Table 2b: A snap-shot of non-compliances identified

Section of this report	Description of non-compliance
7.1 Compliance with the Electricity Generation Licence	The finances of the stations are not ring fenced; they are consolidated together with the finances of other operations of the licensees. Hence, the licensees do not submit audited statements of the stations.
7.3 Compliance with the Distribution Network code	The stations do not have a connection agreement with the operator of the network to which they are connected.
3.4.5 Testing and Compliance	The stations do not keep records of compliance with the requirements of the Network Code for each of the units.

1. INTRODUCTION

The National Energy Regulator derives its mandate from the Electricity Regulation Act, 2006 (Act No. 4 of 2006) ('the Act'). The National Energy Regulator is entrusted with the electricity supply industry as the custodian and enforcer of the national electricity framework.

To execute its mandate, the National Energy Regulator conducted audits on electricity generation industry, specifically the Embedded Generators operated by the Municipalities. The following three licensees were selected as participants:

- City of Tshwane Metropolitan Municipality;
- City of Cape Town Metropolitan Municipality; and
- Nelson Mandela Bay Metropolitan Municipality.

The audit team comprised the following members:

▪ Ms Bongi Masemola	Compliance Engineer
▪ Mr Sandile Jacobs	Senior Compliance Engineer
▪ Mr Tamai Hore	Senior Licensing Engineer
▪ Mr Siphiwe Khumalo	Compliance Technician
▪ Mr Lucky Ngidi	Senior Engineer Regulatory Reform
▪ Ms Lorato Dlamini	Compliance Technician
▪ Mr Diketso Ratema	Senior Quality of Supply Engineer

2. AUDIT OBJECTIVES

All licensed entities are subject to an audit for compliance with licence conditions as imposed by the National Energy Regulator. The audit objectives are to:

- assess compliance with the requirements of the Electricity Generation Licence conditions and the applicable South African Grid Code;
- validate evidence of self-reported non-compliances;
- document the licensee's compliance level and plans; and
- monitor the implementation of corrective action plans.

3. AUDIT PROCESS

The audit team gathers the information during the audit and analyse it together with evidence collected. After the analysis, an audit report which details the record of observations, findings and recommendations is compiled for each licensee audited. The report is sent to the licensee for comments. On receipt of the comments, a consolidated audit report is prepared for approval by the Energy Regulator and thereafter, the licensees are required to develop corrective action plans to address the findings of the audit. The National Energy Regulator will then monitor the implementation of the corrective action plans to assist the licensees into complying.

The various stages of the audit process involve the following activities depicted in **Table 3** below:

Table 3: The various stages of the audit process

Stage 1: Pre-audit	▪ Establish an audit team. ▪ Establish communication with the licensees to be audited. ▪ Prepare audit questionnaire. ▪ Compile audit programme, agenda, and presentation. ▪ Prepare audit package. ▪ Travel logistics.
Stage 2: Audit	▪ Make presentations to inform the licensees about the aim of the audit and the audit process. ▪ Conduct compliance audits on the licensees and take notes.
Stage 3: Post- audit	▪ Consolidate licensee responses. ▪ Compile individual audit reports. ▪ Send individual audit reports to the audited licensees for comments. ▪ Compile consolidated audit report. ▪ Prepare submissions to the Energy Regulator. ▪ Request licensees to submit corrective action plans. ▪ Monitor the implementation of the corrective action plans.

4. METHODOLOGY

The audit questionnaire was the main document used to facilitate the audit and to determine the level of the licensees' compliance. It was sent to the licensees before the day of the audit for preparation. The following documents formed basis for the audit questionnaire:

- the Electricity Regulation Act, 2006 (Act No. 4 of 2006);
- the Generation Compliance Monitoring Framework;
- the Electricity Generation Licences issued to the licensees; and
- the South African Grid Code (Version 8.0 of July 2010), including the Distribution Code (version 5.1 of September 2007).

The questionnaire is divided into eleven sections; five compliance requirements sections relate to:

- the Electricity Generation Licence conditions;
- the South African Grid Code – Distribution Information Exchange Code;
- the South African Grid Code – Distribution Network Code;
- the South African Grid Code – Transmission Network Code; and
- the South African Grid Code – Distribution System Operating Code.

The other six sections of the questionnaire are aimed at establishing whether the licensee aligns itself with industry standard and best practice for benchmarking. The sections are as follows:

- Generation Maintenance Strategy;
- Plant Performance;

- Outage Management;
- Asset Management;
- Refurbishments and Expansion Plans; and
- Primary Energy.

5. SCOPE OF WORK

The scope of work involved the activities detailed in Section 3 *Audit Process,* of this report. **Table 4** below indicates the power stations that were selected for the audit.

Table 4: The Power Stations audited

Licensee	Power Station	Technology	Installed Capacity
City of Tshwane Metropolitan Municipality	Pretoria West Power Station	Coal-fired	180MW
		Gas turbine	24MW
	Rooiwal Power Station	Coal-fired	300MW
City of Cape Town Metropolitan Municipality	Steenbras Power Station	Pumped storage	180MW
	Athlone Gas Turbine	Gas turbine	40MW
	Athlone Power Station	Coal-fired	180MW
	Roggebaai Gas Turbine	Gas turbine	40MW
Nelson Mandela Bay Metropolitan Municipality	Swartkops Power Station	Coal-fired	240MW
	Mount Rd Gas Turbine	Gas turbine	40MW
Operational			**780MW**
Non-operational			**444MW**
Total capacity			**1224MW**

6. CHALLENGES EXPERIENCED BY THE POWER STATIONS

All the licensees audited are experiencing challenges; some of the challenges are common to all and others are unique to a particular licensee or generation station. The high cost of primary energy is one example of a common challenge.

The subsections below discuss the challenges experienced by each station.

6.1. PRETORIA WEST POWER STATION

a. The boilers are designed to burn high quality coal with a calorific value of 28MJ/kg. Over the years, the coal specification had to be scaled down to 24MJ/kg as high grade coal became costly and scarce.
b. Poor quality coal leads to high ash content and pollution.
c. The original coal handling plant was such that the coal would be transported by rail. However, it is mostly transported by road due to difficulties with rail transportation and this contributes to the increasing cost of coal.
d. There are ash storage problems due to insufficient storage facilities. Ash removal is entirely dependent on unpredictable third party purchases but there are no contracts for such purchases which would enable the power station to properly plan for the disposal of ash.

e. Reliability of most equipment has declined over the years as the power station is more than 60 years old.
f. Since October 2011, all six units have been out of service due to boiler water treatment plant problems.
g. There is a constraint regarding the procurement process in the finalisation of coal contracts and urgent repairs.
h. Before the shutdown in October 2011, there had been a decline in performance and efficiency of equipment resulting in reduced output from 180MW to 150MW.
i. There is non-compliance with the current environmental regulations on allowable emissions limit.

6.2. ROOIWAL POWER STATION

a. The power station has been experiencing a lot of boiler tube leaks since the year 2012. During the audit, four out of five units were out of service due to boiler tube leaks.
b. The boiler is under-designed; hence, the units are mostly operated at a maximum of 40MW instead of 60MW.
c. There are constraints regarding the procurement process in the finalisation of coal contracts and urgent repairs.

6.3. STEENBRAS POWER STATION

There are no challenges reported by the station.

6.4. ATHLONE GAS TURBINE

The fuel cost is high as the gas turbine uses Jet A1 fuel which is expensive, resulting in high operating costs.

6.5. ROGGEBAAI GAS TURBINE

a. The Jet A1 fuel is expensive and therefore the cost of operating the station is high.
b. Parts for the engine are scarce as it is one of only a few in the world and it requires specialised equipment to maintain.

6.6. MOUNT RD GAS TURBINE

a. The cost of Jet A1 fuel is high, which leads to high operating costs.
b. Fuel transportation costs are higher due to its location being away from the refineries.

7. SUMMARY OF OBSERVATIONS AND AUDIT FINDINGS

During the audit, there were observations and findings related to compliance with the grid code, the licence conditions and best engineering practices. They were noted, discussed with the licensees; and recommendations were made where necessary.

Subsequently, each sub-heading below briefly discusses the findings and status of compliance of the licensees.

7.1. COMPLIANCE WITH THE ELECTRICITY GENERATION LICENCE

All the audited licensees are non compliant with the licence condition regarding 'Duties of Licensee' which states that a 'Licensee shall not change the capacity, generating process or status of any generation station without approval of NERSA'. All three Licensees have decommissioned or dismantled some of their licensed plants without seeking approval of the Energy Regulator.

The generation stations are mostly dispatched to supply the municipal customers during peak seasons when Eskom's mega-flex rates are higher than own generation costs. To assess the profitability or viability of the station, the stations use cost avoidance model, that is, the cost of buying electricity from Eskom at applicable peak tariffs versus the actual cost of generation. At times, the power is generated so as to ensure security of supply, even though the cost of operating the gas turbine is much higher compared to the cost of buying electricity from Eskom. In such instances the motive for generation is viewed on a broader perspective as that necessary for sustaining the business prospects of the town and also the economy of the country. The Steenbras synchronous machines are sometimes operated as synchronous motors to improve the network's reactive power.

The licensees submit production generation figures on an annual basis as required by the licence conditions, however, generation finances are not ring fenced as they are consolidated together with finances of other operations of the licensees.

Due to high fuel cost, almost all the generation stations are operating at a loss when comparing cost of generation to cost of buying power from the national grid.

7.2. COMPLIANCE WITH THE DISTRIBUTION INFORMATION EXCHANGE CODE

The generation stations are connected to the licensees' own distribution network. Hence, City of Tshwane and City of Cape Town generation stations only communicate with the Municipality's Network Control for dispatch and maintenance whereas Nelson Mandela Bay generation is part of the Municipality's distribution network that is responsible to operate and dispatch.

In some instances there is lack of formal procedures to execute the activities that are stipulated in the code, for example, procedures related to data storage and archiving of operational information and information of newly installed equipment.

7.3. COMPLIANCE WITH THE DISTRIBUTION NETWORK CODE

The code requires that there should be a connection agreement between the generator and the distributor where the parties agree on connection conditions. Most stations do not have a formal or documented agreement with network control to clearly define the responsibilities of each party in terms of maintenance and operation of equipment at the

point of connection. Some do not see the need to have this kind of agreement sighting that management of both entities is within the licensee's realm.

7.4. COMPLIANCE WITH THE TRANSMISSION NETWORK CODE

Compliance with a Grid Code Requirement (GCR) is applicable to a unit/power station according to its rated capacity as specified in Table 1(a) and (b) of the Transmission Network Code.

The minimum installed capacity of the units of the audited stations is 24MW and the biggest is 60MW. Therefore, the units are required to comply with the following requirements, found in Table 1(a) of the Network Code:

- GCR1 - unit protection system.
  - Backup Impedance.
  - Generator Transformer Backup.
  - HV Breaker Fail Protection.
  - Main Protection.
  - Reverse Power.
- GCR3 - Excitation system requirements.
  - Power system stabiliser.
- GCR6 - Governing.
- GCR9 - External supply disturbance withstand capacity where the generation station has more than five units.
- Testing and Compliance.
- Unit modifications.
- Ongoing Monitoring of a Unit’s Performance.

Most stations comply with protection requirements, GCR1 to GCR9, except for Steenbras Power Station where the synchronous machines are operated either as a generator or as a motor when pumping water back to the upper dam; therefore, reverse power protection is not applicable.

The stations do not keep records of compliance of the units; neither do they perform any tests to prove compliance with the Network Code. In addition, the monitoring to confirm ongoing compliance with the applicable parts of the code is not performed nor do the stations communicate compliance information to Network Control.

7.5. COMPLIANCE WITH THE DISTRIBUTION SYSTEM OPERATING CODE

The technical operation of the stations is such that if there is a fault from the station’s side at the point of connection; the station is able to trip and isolate the faulty unit from the distribution network. All the stations have a procedure for black-out and emergency start-up.

Notifications of planned outages are communicated to network control. However, in most stations, there are no procedures that clearly define the operational boundaries of the parties or the communication method and format for notifications.

7.6. GENERATION MAINTENANCE STRATEGY

The generation stations base their scheduling of maintenance on original equipment manufacturers (OEM) recommendations. Some use the System Application and Production (SAP) maintenance planning system to schedule and keep records of proactive, preventive and reactive maintenance, whereas others do not have a maintenance planning system but use Microsoft Office Excel. There is sufficient time to schedule proactive and preventative maintenance since they are not always in operation; however, the stations are mostly overwhelmed with breakdowns such that it becomes the focus of their maintenance.

7.7. PLANT PERFORMANCE AND KEY PERFORMANCE INDICATORS (KPIS)

Most generation stations do not set technical performance targets due to their operating regime and dispatch philosophy. A station generates whatever it is capable of generating at the time when the power is required. The stations are used as peaking stations to supply when the Municipality demand is high and there is a shortage of supply from the grid or when it is cheaper to generate than to buy from the grid.

Rooiwal Power Station adopted the following technical performance indices and targets; however, they were not implemented:
UCF + PCLF + UCLF = (80 + 10+ 10) %

Unit Capability Factor	UCF
Planned Capability Loss Factor	PCLF
Unplanned Capability Loss Factor	UCLF

Steenbras Power Station adopted technical performance indices similar to Rooiwal's with some additional indices such as:

Unplanned Automatic Grid Separations	UAGS
Deserving Maintenance and Checkout Facility	DMCF

7.8. OUTAGE MANAGEMENT

Planned outages are scheduled during low demand periods, for example, Steenbras Power Station undertakes its outage programmes between September and April because it is a low demand period for the City of Cape Town.

OEM recommendations for maintenance form the basis for maintenance standards. Each licensee co-ordinates the outage among its own generation stations so that there is some capacity on standby should it be required. Some licensees have strategies to mitigate outage risks, for example, one licensee ensures that an outage plan is completed 28 days before the start of an outage to ensure that all resources are catered for. Another example is the implementation of bi-weekly meetings that are held during the outage period where possible risks are identified and completed tasks are signed off by the supervisor after inspection.

7.9. ASSET MANAGEMENT

The plant equipment in most stations is labelled so as to identify the equipment on the asset register and some use the SAP system to manage station assets.

The stations do not have an asset tracking system in place to ensure that maintenance history of equipment is correctly captured. However, there are rare incidences where equipment is removed from one unit and installed in the other.

Only a few spares used for the day to day operations of the stations are kept on sites and do not include major plant equipment such as transformers and generators. Some licensees keep the spares in a central municipal holding facility.

7.10. REFURBISHMENT AND EXPANSION PLANS

Refurbishments and replacements are done according to the OEM recommendations, routine maintenance test results and condition based monitoring results as the equipment breakdown frequency increases uncontrollably.

The process for initiating and obtaining funding for refurbishment or replacement begins with identifying a need. A proposal or motivation is drafted and presented to the Municipality. After approval of the proposal and funding, the station initiates the procurement process. All stations follow a procurement process underpinned by the Municipal Finance Management Act.

The licensees do not have any expansion plans for the existing stations or new build. Some plan to undertake projects to restore the station's capacity to the rated installed capacity as it has declined with years of operation.

7.11. PRIMARY ENERGY

Fuel is the major operational expense of the cost of generation of the audited stations; except Steenbras pumped storage which uses water as its source for generating electricity.

Rooiwal and Pretoria West cost of primary energy is escalating due to; the short-term coal supply contracts, their location which is far from coal fields and the design technology that requires high grade coal.

The fuel supply contracts are valid for not more than three years due to Municipal Finance Management Act requirements. This poses a challenge to the coal fired stations because the fuel prices on short-term contracts tend to fluctuate greatly and at times the supply is unreliable. In addition, availability of fuel is also largely affected by the limitations of the procurement process which takes longer to reach finalisation.

8. PLANT INSPECTION

8.1. SCOPE OF PLANT INSPECTION

The plant inspection was conducted as complementary to the audit questionnaire.

The inspection covered the following aspects:
- safety of equipment, for example moving equipment safeguarded;
- display of safety signs and emergency evacuation routes;
- environmental issues, for example water, steam or oil leaks;
- housekeeping, for example cleanliness, everything in its place; and
- plant labelling.

The following areas were inspected:
- turbine, generator and associated plant equipment;
- generator transformers and unit transformers;
- station control room; and
- critical spares storage.

8.2. ON-SITE OBSERVATIONS

In the City of Tshwane's coal -fired plant boiler area, turbine and generator side, some electrical panels are not locked to prevent unauthorised access. There are no visible safety and emergency evacuation signs at some parts of the plant. Most transformers at Pretoria West Power Station have serious oil leaks, see **Figure 1:** Top view of Pretoria West Power Station 11/132kV Generator step up transformer. The station control room has reasonable access to the operational status of the plant as it is not fully automated. At the ash plant, some of the plant equipment is not labelled. Some safety and emergency signs are fading and not clearly visible. There is no critical storage facility available at both stations but there is a general spares storage facility at Rooiwal to keep day to day spares.

Figure 1: Top view of Pretoria West Power Station 11/132kV Generator step up transformer

Almost all sections of the plants that were inspected at City of Cape Town had the operating controls locked off, visible safety and emergency signs, transformers are installed inside bund wall area with drainage and restricted access, the plant operator is able to access or view the operational status of most plant equipment and the stations keep minimum day to day spares. Housekeeping at all the stations is very good i.e. plant equipment is neat and tidy, see **Figure 2:** Back view of Athlone 11/66kV generator transformer.

Figure 2: Back view of Athlone 11/66kV generator transformer.

At Nelson Mandela Bay Municipality there are no visible safety and emergency evacuation signs in the gas turbine housing but housekeeping is in order. Safety signs are clearly displayed in the transformer area and it is installed inside a bund wall in a restricted access area. There are visible signs of oil leaks in the transformer area and the transformer pipe between the conservator tank and the silica gel breather is badly rusted, see **Figure 3:** Mount Rd Gas turbine 11/66kV step up transformer.

Figure 3: Mount Rd Gas turbine 11/66kV step up transformer

Plant equipment in the coal-fired stations is partially labelled, with some of the small items of the plant such as cables and measuring equipment unlabelled. Plant labelling is also partially implemented on the gas turbines due to safety requirements that prohibit the installation of labels or markings directly on the gas turbine as it may pose a fire hazard due to the high operating temperatures of the gas turbine.

9. SUMMARY OF OBSERVATIONS AND FINDINGS ON INDIVIDUAL LICENSEES

9.1. CITY OF TSHWANE

The 24MW gas turbine at Pretoria West Power Station was decommissioned, dismantled and sold. There is no evidence that the Licensee informed the Energy Regulator or lodged an application to amend its licence to remove the gas turbine.

The Licensee is not fully aware of the requirements of the South African Grid Code and does not have any specific programmes in place to ensure compliance, as stipulated by Section 3.1.14 of the Network Code.

9.2. CITY OF CAPE TOWN

Generation finances are managed separately in the SAP software. The costs are inputs to the audited financial statements of the Licensee.

The Licensee recently developed a programme to ensure compliance with the South African Grid Code.

In 2011 the Licensee replaced all four 55MVA generator transformers at Steenbras with new sets rated at 65MVA. The future plan is that the generator sets might also be upgraded to match the transformers so as to achieve an increased unit output or capacity.

There is no formalised procedure for data storage; however, archiving of electronic operational information is maintained by the Information Technology Department who stores the information on the Municipality's network servers. Manuals and drawings are stored in various managers' offices such as the electrical maintenance supervisor and head of generation who are responsible for controlling access to the information.

9.3. NELSON MANDELA BAY MUNICIPALITY

The existing licence is for the operation of a 240MW coal fired power station which was decommissioned in 1997. However, the licence was not amended to remove the coal fired power station. The 40MW gas fired power station that is operated by the licensee is not licensed by the Energy Regulator. The licence also bears the licensee's former name, Port Elizabeth Municipality.

A dedicated budget for the gas turbine operation, excluding human resource costs is maintained, however, just like the other licensees, the operating costs of the gas turbine are consolidated together with other operations and audited in totality.

Although the licensee does visual inspections on a periodic basis, there is no check list or job inspection card to guide new employees and the licensee does not store maintenance records of the gas turbine.

The Licensee is not fully aware of the requirements of the South African Grid Code and does not have specific programmes in place to ensure compliance.

10. CONCLUSION

Detailed findings and recommendations of the audit for each licensee are presented in the individual audit reports of the licensees.

From the audit findings, the following conclusion is made:

- The licensees are not fully aware of the requirements of the licence conditions and that of the South African Grid Code.

- The cost of operating the coal and gas fired generation stations is very high due to the rising fuel cost (coal and jet fuel); hence, it is expensive to operate the stations compared to buying power from Eskom.

- At times, it is a challenge for the stations to receive adequate funds from the Municipality due its inefficiencies.

Amidst the aforementioned constraints and challenges, none of the licensees raised concerns with human resources; there is sufficient work force to keep up with the operations of the stations.

The licensees are expected to establish communication channels to liaise with the National Energy Regulator and the Grid Code Secretariat for any clarifications related to the requirements of the licence conditions or the South African Grid Code. Furthermore, the National Energy Regulator is committed to assisting the licensees with the implementation of the corrective action plans to address the findings of the audit.