

SOUTH AFRICAN DISTRIBUTION GRID CODE PHASE 2 IMPLEMENTATION

1. INTRODUCTION

This paper is a follow up and a rehash of the South African Distribution Code that was presented by NERSA in the 2007 AMEU convention held in Durban ICC. The presentation explained the approval of the South African Distribution Code by the Energy Regulator, as well as the phase 1 implementation process..

This paper seeks to explain the details in the contents, purpose, management processes and compliance monitoring of the South African Distribution Code.

Originally the South African Grid Code was developed with a view that the South African Regional Electricity Distributors (REDs) will have come into place shortly, which amongst other things would make the regulation of the industry to be much more efficient and simpler. With the delay of REDs coming into place, NERSA had to review its regulatory strategies to suit the current industry environment. The Distribution Code is also driven by the need to ensure standard rules for participation in the electricity industry especially from independent power producers.

The South African Distribution Code development process took about 2 yrs, starting in June 2005, and the main participants were:

- NERSA - Chair
- AMEU (main representation: Ekurhuleni, eThekweni and Cape Town)
- Energy Intensive User Group (EIUG) / Large Customers
- Department of Minerals and Energy (DME)
- Eskom (Distribution, Transmission and Generation)
- System Operator (also Secretariat)
- Independent Power Producers (Kelvin Power station)

In June 2007 the Grid Code Advisory Committee (GCAC) proposed the South African Distribution Code for the Energy Regulator to consider for approval. In August 2007 the final version 5.1 was approved by the Energy Regulator with the view of including it to the appropriate Licenses as a license condition. Upon approval of the code, NERSA decided that implementation should be done in a phased approach, taking into consideration the dynamics of how the Electricity Distribution Industry is, including:

- The high number of licensees being regulated (about 187 including Eskom) as well as;
- the differences in sizes of the licenses in terms of installed capacity, financial and human resources.

NERSA also agreed with the GCAC that the first phase of the Distribution Grid Code implementation will involve the licensees with the installed capacity greater or equal to 100MVA.

The first phase implementation was workshopped with the licensees affected by the NERSA decision of the phased approach. The workshopping process started late in 2007, with a presentation at the AMEU conference until mid 2008. Phase 1 approach was in two fold. The first step was that each licensee will be given 12 month to make preparations during this period to ensure compliance with the requirements of the Code. That included:

- Critical review and understanding of the Code requirements,
- Assess areas where there is non-compliance such that a licensee can apply for temporary exemptions where necessary
- Assess where amendments to the Code may be necessary;
- Assess areas where there will be a need to apply for derogations
- Follow the appropriate process (Governance Code of Grid Code) to apply for amendments or exemptions;

The second step is that on 18 November 2009 the Electricity Distribution Licenses will be amended to include the Distribution Grid Code as a condition to be complied with.

The observations from the Regulator's point of view since the beginning of phase 1 were:

- There have been minimal or no response from the industry with regard to the process

Because of this observation the Energy Regulator felt that this process needs to be rehashed and communicated properly in order to refresh the industry and alert them once again about the implementation process of this code.

2. BACKGROUND

The main drivers of these initiatives were 1998 Energy White Paper & Electricity Regulation Act (2006) which required the Electricity Supply Industry reform in South Africa and introduction of Independent Power Producers, Regional Electricity Distributors & Wholesale energy trading market

Currently Transmission and Distribution Codes design attempt to achieve the vision of the 1998 Energy White Paper. NERSA remains the codes administrative authority as required by the Electricity Regulation Act with the right to develop & enforce electricity industry codes and approve all changes and exemptions to the codes.

3. THE DISTRIBUTION GRID CODE OBJECTIVE

The Distribution Grid Code is an industry code of practice that defines detail conditions for access to and use of the Distribution System including basic rules, procedures and requirements that govern the operation and maintenance of the Distribution System. The Distribution Grid Code will form part of the licensing conditions of the Distribution Network Service Providers. The restructuring of the Electricity Supply Industry in South Africa will present significant challenges pertaining to the operation, planning and maintenance of the Distribution System. The Distribution Grid Code is also intended to define the technical aspects of the Distribution System which the Distributors and other Users of the Distribution System should comply with.

Mainly the Distribution Grid Code Establishes reciprocal obligations of participants regarding the use, development & operation of the *Distribution System (DS)*

It ensures:

- Non-discriminatory access to the Distribution System
- Adherence to minimum technical requirements for connection to the Distribution System
- Distribution System integrity & adequate service delivery
- Clarifies accountabilities of all parties
- Information availability

The benefits that the code will have to the industry are:

- Provides a stable platform for the evolving ESI
 - For example, introduction of REDs & Independent Power Producers
- Sets foundation for future contractual arrangements
- Improved efficiency and transparency of service providers
- Harmonization of industry standards
- Improved regulatory measures

The Distribution Grid Code needs to be updated through regular amendments to incorporate industry development and improved practices. Furthermore the required exemptions, derogations and amendments need to be administered. The future intention is to incorporate the Distribution Conditions into the South African Grid Code in order to have one Grid Code for distribution, transmission and generation.

4. CONTENT OF THE DISTRIBUTION GRID CODE

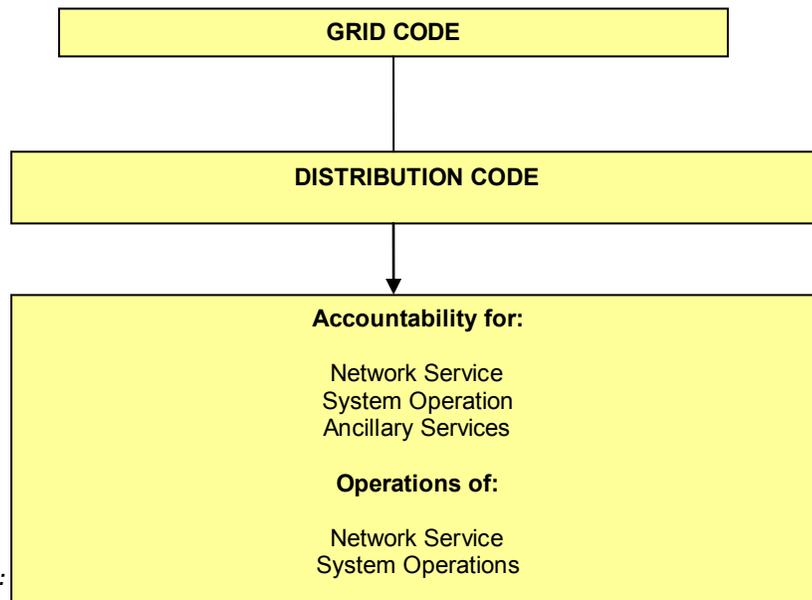


Figure 1:

Figure 1 describes the structure of the South African Electricity Industry Codes of practice content.

The Grid Code for Transmission Tx vs Distribution Dx Code Participants:

Tx Code

- Generators >20MVA)
- Gx: Providing ancillary service
- Dx: Connected to TS
- Directly connected customers
- Retailers / Traders for use of TS
- Tx network service providers
- System Operator
- AS providers (interruptible loads

Dx Code

- Embedded generators
- Co-generators
- End-customers
- Retailers
- Resellers
- Distributors
- System Operator

The Codes under the Distribution Code are:

- Glossary of definitions - Preamble
- Distribution Network Code
- Distribution System Operating Code
- Distribution Metering Code
- Distribution Tariff Code
- Distribution Info Exchange Code
- Code Governance
 - GCAC decided that current Tx Governance Code process shall apply but the Governance Code of the Distribution Grid Code is currently in draft stages

These codes can be downloaded on the NERSA website at www.nersa.org.za , select Electricity on the homepage then download the codes under Compliance Monitoring. The NERSA website is currently undergoing a revamp so that it can be much easier to find the Codes, Standards and other related documents.

(I) Governance Code

The governance code describes the provisions necessary for the overall administration and review of the various aspects of the *Distribution Code*. This code shall be read in conjunction with the relevant legislation,

the licenses issued to *generators*, *transmission* companies and *distributors* and other *NERSA* adopted codes of conduct that relate to the *Electricity Supply Industry (ESI)*.

The accountabilities of various entities in the governance of the *Distribution Code* are sketched in figure 2



Distribution Grid Code amendment, derogation or exemption procedure

- (1) *NERSA* is the approval authority for the *Distribution Code*. Any amendments to, derogation to or exemptions from the *Distribution Code* shall therefore be approved only by *NERSA* as guided by the *GCAC*.
- (2) Any *participant*, member of the *GCAC* or *NERSA* may propose amendments to the *Distribution Code*.
- (3) Any *participant* can apply for an exemption or derogation to the *Distribution Code* requirement. Exemption and derogation from complying with provisions of the *Distribution Code* may be granted by *NERSA* for the following reasons:
 - To provide for existing equipment that has not been designed with consideration for the provisions of the *Distribution Code*
 - To facilitate transition through interim arrangements
 - To facilitate temporary conditions necessitating exemption
- (4) All exemption applications should clearly indicate the following:
 - the reason for the non-compliance,
 - the current capability (even if this is less than what the code specifies)
 - the duration of the exemptions
 - action plan put in place to fix the non-compliance and
 - any other information that can be used to justify why the exemption should be granted.
 - With the application, a project plan to address the non compliance will be required
- (5) All derogation applications should clearly state the following:
 - the reason for the non-compliance,
 - the current capability (even if this is less than what the code specifies)
 - The suspensive condition upon which the validity and the duration of the derogation depends
 - any other information that can be used to justify why the derogation should be granted.
 - With the application, a project plan to address the non compliance will be required
- (6) All amendment applications should clearly state the following:
 - the current clause to be amended
 - proposed changes
 - the reason why the code should be amended
 - any other information that can be used to justify why the code amendment is necessary.
- (7) The procedure for amendment, exemption or derogation is sketched in figure 3.

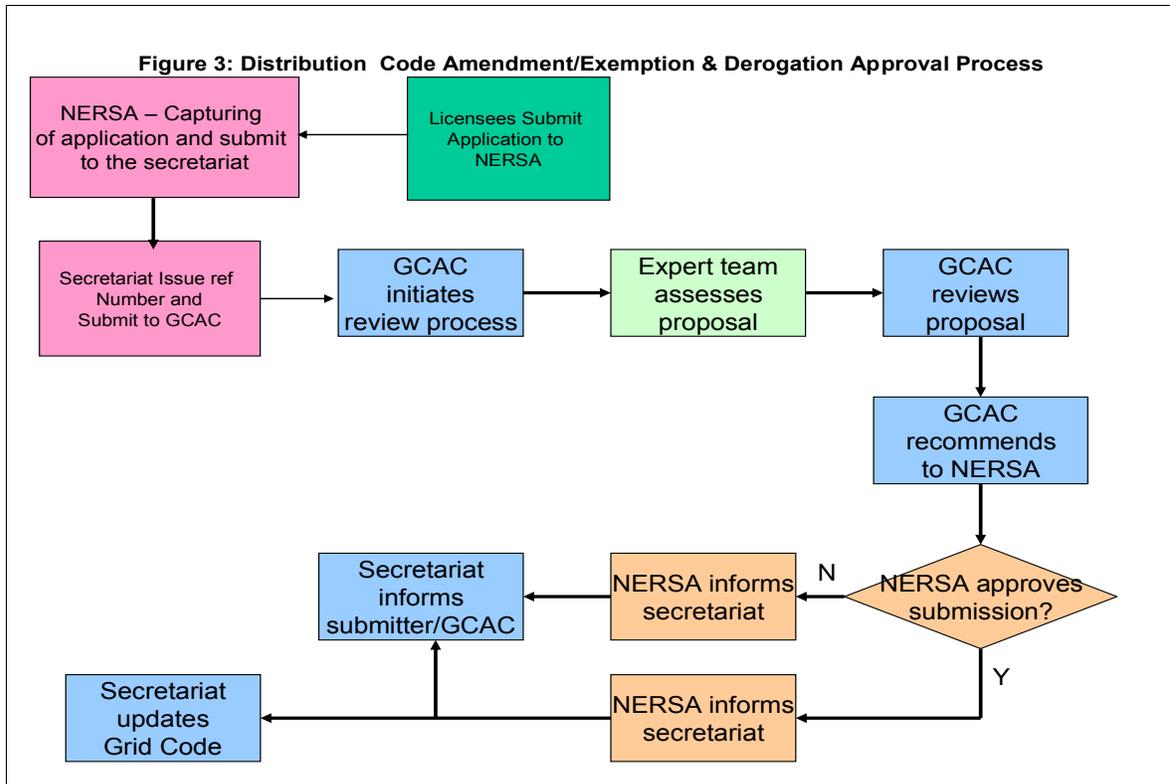


Figure 3 outlines the manner in which the applications for amendments, exemptions and derogations should be done by the industry as well as the approval process.

A formal cover letter indicating the clauses that maybe affected on the code is required to accompany the standard form that is used to apply for amendments, exemptions or derogations. This form can also be downloaded on the NERSA website or made available at the applicant's request.

Upon receipt of your report or application the Energy Regulator Will:

- Acknowledge receipt thereof
- Furnish you with a reference number
- Furnish you with the name / names and contact details of the personnel dealing therewith
- Advise the applicant on the duration after which they can expect feedback

Applications/ Draft Proposals shall be sent to: Attention Electricity Regulatory Reform Department

<p>Post to: National Energy Regulator of South Africa P. O Box 40343 Arcadia Pretoria 0007</p>	<p>Or Hand Deliver to: 526 Vermeulen Street Arcadia Pretoria 0007</p>	<p>Or Contact Lucky Nhlanhla Ngidi Tel: 012 401 4716 Fax: 012 401 4700 Cell: 083 499 1999 lucky.ngidi@nersa.org.za or Simphiwe Makhathini Tel: 012 401 4776 or 0832569139 Simphiwe.makhathini@nersa.org.za</p>
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Below is a typical example of an Application for an amendment of the standard form:

RSA DISTRIBUTION GRID CODE AMENDMENTS FORM

Submitter's name			
Organization represented	ESKOM		
Date of submission	29 July 2008		
Section of the Code to be amended (Network, Metering etc.)	Network		
Reference number (to be issued by Grid Code secretariat)	GCAMD08/005 Rev 2 This version include: <ul style="list-style-type: none"> ▪ Outcome of IET Meeting held on 29 Oct 2008 ▪ Outcome of the GCAC Meeting held on 14th May 2009 		
GENERAL AMENDMENTS			
SPECIFIC AMENDMENTS			
Clause	Current Statement	Proposed Changes	Reason for change
5.1.5 Transmission busbar protection			

Below is a typical example on the application of exemption or derogation:

<p>NERSA ADDRESS</p> <p>Dear Sir</p> <p>IPS 0010/08 APPLICATION FOR AN EXEMPTION FROM COMPLYING WITH PROVISIONS OF THE SA GRID CODE: ALL KOEBERG UNITS TYPE OF EXEMPTION REQUESTED Permanent REQUESTED DEADLINE TO COMPLY (IF TEMPORARY EXEMPTION ONLY) Permanent TYPE OF CODE Network Code CLAUSE 3.1.7 Restart after power station black-out CLAUSE DESCRIPTION 3.1.7 Restart after power station black-out SUB-CLAUSE, BULLET - DESCRIPTION/REQUIREMENT XXXXX REASON/EXPLANATION OF NON-COMPLIANCE XXXXXX REMEDIAL ACTION TO UNDERTAKE (IN ORDER TO COMPLY)</p>	<p>05 September 2008</p> <p>Mr XXXX Company Tel: +27 21 Fax: +27 21</p>
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(II) Glossary of Definitions

This document contains all terms, acronyms and list of standards used in the Dx Code for the industry's reference

(III) Distribution Network Code

This code describes the following:

- procedure/process for new connections (incl. sample application form)

- set out the responsibilities of all parties regarding use and development of the Distribution Networks
- Included some embedded generation connection requirements.

Distributors' responsibilities prescribed on this code are:

- prepare "*customer connection information guide*"
- Upon customer request, prepare "*offer to connect*" and ultimately "*connection agreement*"
- advise potential *users* of the expected reliability on its network
- conduct "*Distribution System impact assessment studies*"
- compile a 10-year load forecast at each Dx incoming Point of Supply
- publish 5-yr network development plan reviewed at least every 3 yrs
- Comply with reliability indices set annually by NERSA

Network investment

- Least life-cycle cost investment criteria in line with NRS 048 & NERSA reliability requirements
- Premium connection costs shall be borne by the requesting customer
- Statutory investments will be based on predetermined criteria. Government requests to be considered if passed by legislature.
- No cross-border subsidies shall apply for international customers
- Refurbishment to be done by the Distributor when equipment becomes unsafe & / or unreliable to operate. Conditions:
 - customer must also agree to the timing
 - engineering solution to minimise costs of both customer and Distributor
- Provision and costs for excluded services shall be negotiated between the parties.
- NERSA reserves the right to regulate these costs if unreasonable.
- Embedded Generation requirements included in sec 8
- EGs >10MVA must also comply with requirements of the Grid Code

(IV) Distribution System Operating Code

- Defines roles of parties regarding operating of the DS and connected customer equipment
- It promotes having negotiated agreements between parties regarding network operating

Scope:

- Safety of personnel and equipment
- Operational responsibilities of Embedded Generators and other customers
- Coordination of outages and commissioning
 - Dx has right to test customer equipment at point of connection
- Contingency planning
- Operational authority, procedures, liaison with other participants and communication requirements
- Conditions for disconnecting customers (mainly for safety related reasons)
- May shed load to maintain network integrity, but customers must be informed (for planned maintenance → 5 days in advance)

(V) Distribution Metering Code

Scope:

- Specify distributors requirements with respect to metering installations
- Extensive reference to NRS 057, but Dx Code takes preference
- Tx/Dx boundary meters is the responsibility of Transmission
- Dx/Customer meters is the responsibility of Distributors
- Metering data validation, collection, processing and verification shall be done as per NRS 057
- Clarify metering data integrity and storage requirements
- Automated Meter Reading is recommended for large Customers
- Confidentiality: Metering data to be regarded as confidential but may not be unreasonably refused if customer requests it
- Also include dispute resolution process

(VI) Distribution Tariff Code

- The Code describes:
 - Principles for the determination of tariffs
 - Segmentation of costs for tariff design purposes
 - Tariff design for International load customers
 - Recovery of subsidies and other levies using tariff structures
 - Connection charges principles (Standard and Premium)
- Included allowable charges:
 - Energy charges including recovery of losses
 - Network charges, including ancillary services
 - Customer services charges
 - Connection charges.
- Tariff have to be as Cost reflective as possible
- Non-tariff costs (excluded services costs) have to be shown separately and may be regulated
- Appendix 1 –guideline to designing tariffs

(VII) Distribution Info Exchange Code

- Objective: reciprocal obligations of parties with respect to provision of information
- General principle: mutual agreement between parties
- Information divided into 3 types:
 - Planning info (e.g. info for connection & contingency planning)
 - Operational info (e.g. real-time dispatch, maintenance & commissioning)
 - Post-dispatch (e.g. incident investigations)
- Each party to appoint information owner to facilitate info exchange
- Data storage, security & archiving requirements:
 - All information should be auditable by NERSA
 - Storage: 3 months for voice recorders, except where there was an incident
 - Storage: 5 years all other information except voice information
- Confidentiality requirement: information exchanged is non-confidential unless indicated by the owner

5. PHASE 1 IMPLEMENTATION PROCESS – WHAT HAS HAPPENED?

- NERSA workshopped the Code to the distributors with Max Demand >100MVA
- Extension to current license obligations initially Distributors with Max Demand > 100MVA – To occur in November 2009
- Phased in approach over 12 months (trial) period
 - Month 1 – 6 Distributors were given an opportunity to do self compliance assessment
 - Month 7 – 12 Distributors required to Inform NERSA of compliance status – **minimal feedback**
 - Apply for exemptions and amendments (via Code Secretariat through NERSA) – **minimal feedback**
 - Including interpretation requirements – **minimal feedback**
 - Month 12 Full implementation, licenses amended to include the code & parties expected to be fully compliant
 - If no exemption → non-compliant (penalty clause in the Act) - **Ongoing**
 - NERSA to conduct adhoc compliance audits - **Ongoing**

6. PHASE 2 IMPLEMENTATION PLAN – WHAT IS GOING TO HAPPEN NEXT?

- NERSA to start workshopping the Code to the Distributors with Max Demand 50MVA>100MVA – To Commence in November 2009
- Extension to current license obligations secondly to Distributors with Max Demand 50MVA>100MVA
- Phased in approach over 12 months (trial) period
 - Month 1 – 6 Distributors will be given an opportunity to do self compliance assessment
 - Month 7 – 12 Distributors required to Inform NERSA of compliance status
 - Apply for exemptions and amendments (via Code Secretariat through NERSA)

- Month 12 Full implementation, licenses amended to include the code & parties expected to be fully compliant
 - If no exemption → non-compliant (penalty clause in the Act)
 - NERSA to conduct adhoc compliance audits

7. INTERNATIONAL BEST PRACTICE FOR COMPLIANCE ASSURANCE ON THE CODES AND STANDARDS

COMPLIANCE FRAMEWORK

Most of the Regulators have fully developed Compliance Frameworks in place, these are used mostly to conduct compliance monitoring and enforcement to the industry. This is normally done by conducting audits which would have questionnaires for both the actual business as well as site audits. The frameworks are normally open for public and industry's access. The first step to industry self compliance assurance is to align itself with these frameworks and be pro active in terms of trying to align these frameworks with the environment in which their utilities are run. Because of the research that goes into the development of these compliance frameworks, this exercise can assist the licensees to also align themselves with the best business practices to ensure that they are aware of the status quo of their utilities in terms of compliance.

The observation is that there is minimal pro activeness in the industry in terms of self monitoring to comply with the rules and regulations before the Regulator's adhoc compliance audits. In most cases when regulators are conducting these audits, they do not get the full picture of the condition or status quo of the utility. This maybe because of time constraints in terms site audits, when they are done they do not cover the whole utility infrastructure. This results in reports that do not appropriately or completely reflects the true utility picture with respect to its operations. This signifies the importance of self assessment by utilities and proper information sharing with the Regulator.

The licensees need to ensure that they conduct self assessment using the regulatory frameworks at their disposal. This can help the licensees in knowing exactly what is happening in their businesses in terms of the finances, quality of supply and service as well their infrastructure asset condition and management.

The industry needs to remember that complying with industry codes and standards, is for the good of their business and not the Regulator an lastly for them to be able to run their utilities in a professional and efficient manner.

WORK GROUP & WORK STREAMS FORMATION

To ensure efficient and effective self assessments it is highly recommended that the licensees form internal experts Work Group which can be broken down into different work streams with clear terms of reference on the self assessment.. Following the formation of the work group, it is recommended that the following be done:

- Delegate tasks to each work stream depending on their expertise i.e a certain code that they will be analyzing to understand and then produce a work plan on how the contents of the code will be monitored and implemented in the business and the infrastructure
- Each work stream has to fully understand the requirements in the code and produce a self monitoring framework using the code as a reference
- After the self monitoring framework is done, execute the plan in the framework by:
 - Conducting Self Audits
 - Produce Reports with the findings
 - Compile the action plan report to address identified non compliances
 - Compile the execution plan of addressing the non compliances
 - Where possible draft the possible amendments and exemptions that might be needed as per Governance Code requirements

After all this have been done, it is recommended that an internal committee or body that will monitor the action plan based on the findings of the work streams reports is formed.

8. CONCLUSION

It is very clear that, for the Energy Regulator to regulate efficiently and in a manner that will be beneficial to all parties in the end, the Regulator will need adequate cooperation of the industry. . The manner in which the industry is structured currently poses challenges for the Regulator to perform its mandate efficiently, there are more than 200 licensees that needs to be regulated by just one Regulatory Body. This also brings a point of a need to accelerate the process of the formation of the Regional Electricity Distributors. The research and future industry structure plans shows that regulating 6 distribution entities, Generation and Transmission will prove to be more efficient

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