Electrical Installation Standard: SANS 10142-1-2

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CONTENT

1. Standard and Regulations for SSEG
2. SANS10142-1-2 Background
3. Implication for the industry
4. Status quo and Next steps
5. Take home messages

1. APPLICABLE LEGISLATION

Utility

OHS Act
- Safety of staff
  - Electrical Machinery Regs
  - Electrical Installation Regs

Electricity Regulation Act
- Generation License
- Distribution License
  - Distribution Grid Codes
  - Small Scale Electricity Generation Regulations

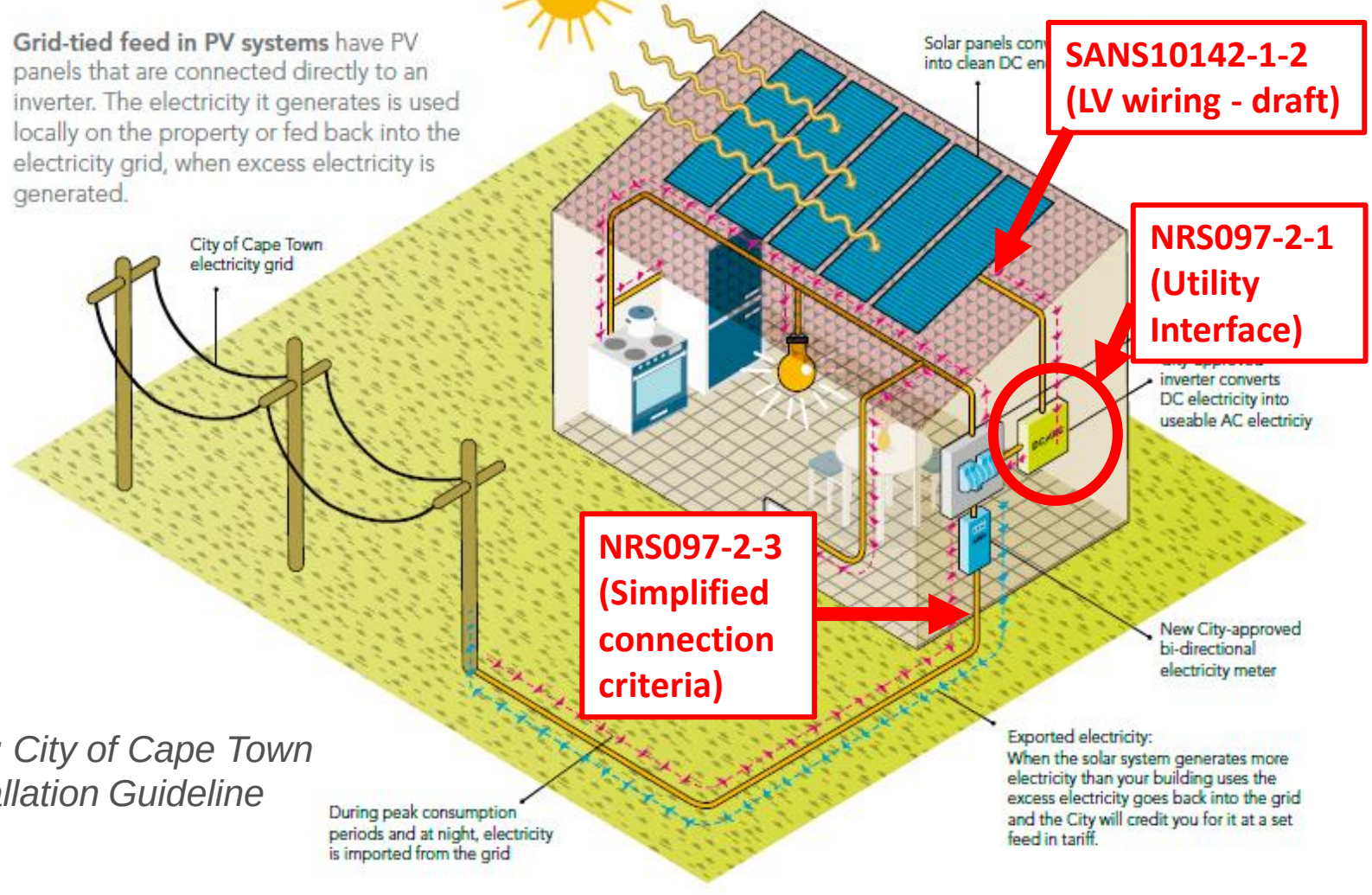
Property Owner

OHS Act
- Safety of Installation
  - Electrical Installation Regs
    - Wiring Code SANS10142-1-2
    - CoC

Electricity Regulation Act
- Generation License requirements
- NERSA Rules and Tariffs for SSEG
- Utility Electricity By-law
  - Municipal Requirements for SSEG
  - NRS 097-2-1
  - NRS 097-2-3

01 GRID-TIED FEED IN PV SYSTEMS

Grid-tied feed in PV systems have PV panels that are connected directly to an inverter. The electricity it generates is used locally on the property or fed back into the electricity grid, when excess electricity is generated.



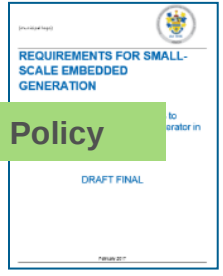
SANS10142-1-2 (LV wiring - draft)

NRS097-2-1 (Utility Interface)

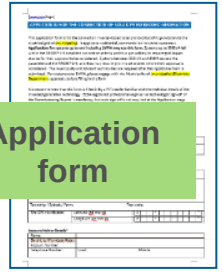
NRS097-2-3 (Simplified connection criteria)

Source: *City of Cape Town PV installation Guideline*

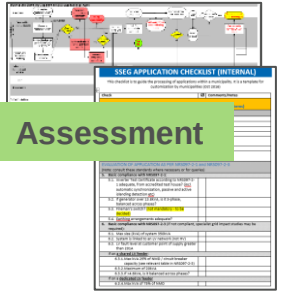
1. Municipal SSEG Process Elements



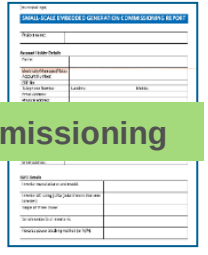
Policy



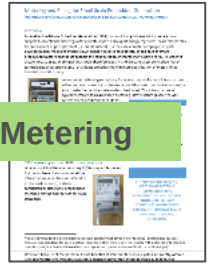
Application form



Assessment



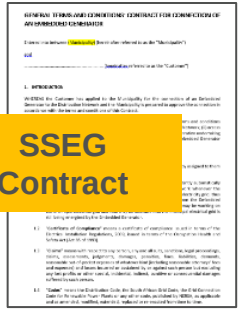
Commissioning



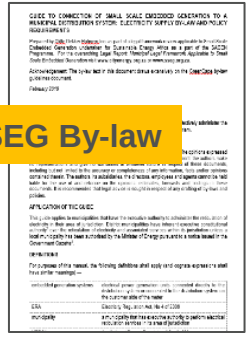
Metering

Tariffs

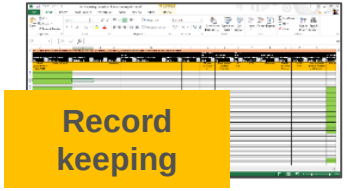
For more info: www.sseg.org.za



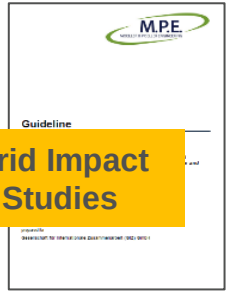
SSEG Contract



SSEG By-law



Record keeping

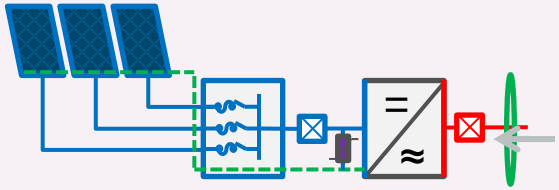


Grid Impact Studies

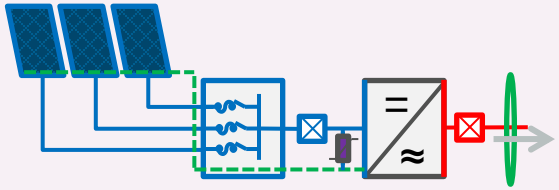
Info for public

1. NRS 097-2-1

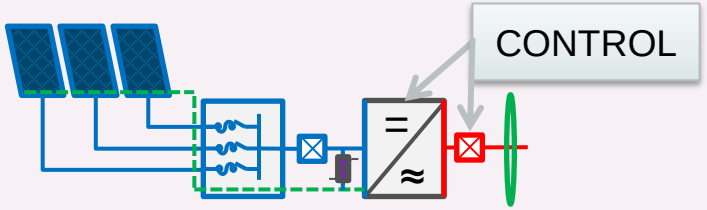
What to expect?



What is allowed?



What to do?



3. NRS097-2-1:Approved Inverter list example

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

ELECTRICITY SERVICES

TYPE TESTED INVERTERS/EQUIPMENT IN TERMS OF NRS 097-2-1 **2016 12 21**

Make	Model	Test House	Certificate date	Valid until	Report number	Certificate of Compliance number	Comments
ABB	PRO-33.0-TL-OUTD-400	Bureau Veritas	2014/10/10	*	13TH0463-NRS 097-2-1	U14-0530	The unit must be provided with an external RCMU type B
ABB	PRO-33.0-TL-OUTD-S-400	Bureau Veritas	2014/10/10	*	13TH0463-NRS 097-2-1	U14-0530	The unit must be provided with an external RCMU type B
ABB	PRO-33.0-TL-OUTD-SX-400	Bureau Veritas	2014/10/10	*	13TH0463-NRS 097-2-1	U14-0530	The unit must be provided with an external RCMU type B
ABB	PVI-13.8-TL-OUTD	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-13.8-TL-OUTD-S	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-13.8-TL-OUTD-FS	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-13.8-TL-OUTD-W	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-12.5-TL-OUTD	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-12.5-TL-OUTD-S	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-12.5-TL-OUTD-FS	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-12.5-TL-OUTD-W	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-11-TL-OUTD	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-11-TL-OUTD-S	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-11-TL-OUTD-FS	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-11-TL-OUTD-W	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-10-TL-OUTD	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-10-TL-OUTD-S	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-10-TL-OUTD-FS	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-8-TL-OUTD	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-8-TL-OUTD-S	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-8-TL-OUTD-FS	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-6-TL-OUTD	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-6-TL-OUTD-S	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	PVI-6-TL-OUTD-FS	TUV Rheinland	2015/02/08	*	28 107 377 001	AK 60099744 0001	
ABB	TRIO-8.5-TL-OUTD-400	TUV Rheinland	2013/11/28	*	28 106 226 001	AK 60090280 0001	
ABB	TRIO-8.5-TL-OUTD-S-400	TUV Rheinland	2013/11/28	*	28 106 226 001	AK 60090280 0001	

3. NRS 097-2-3 Summary

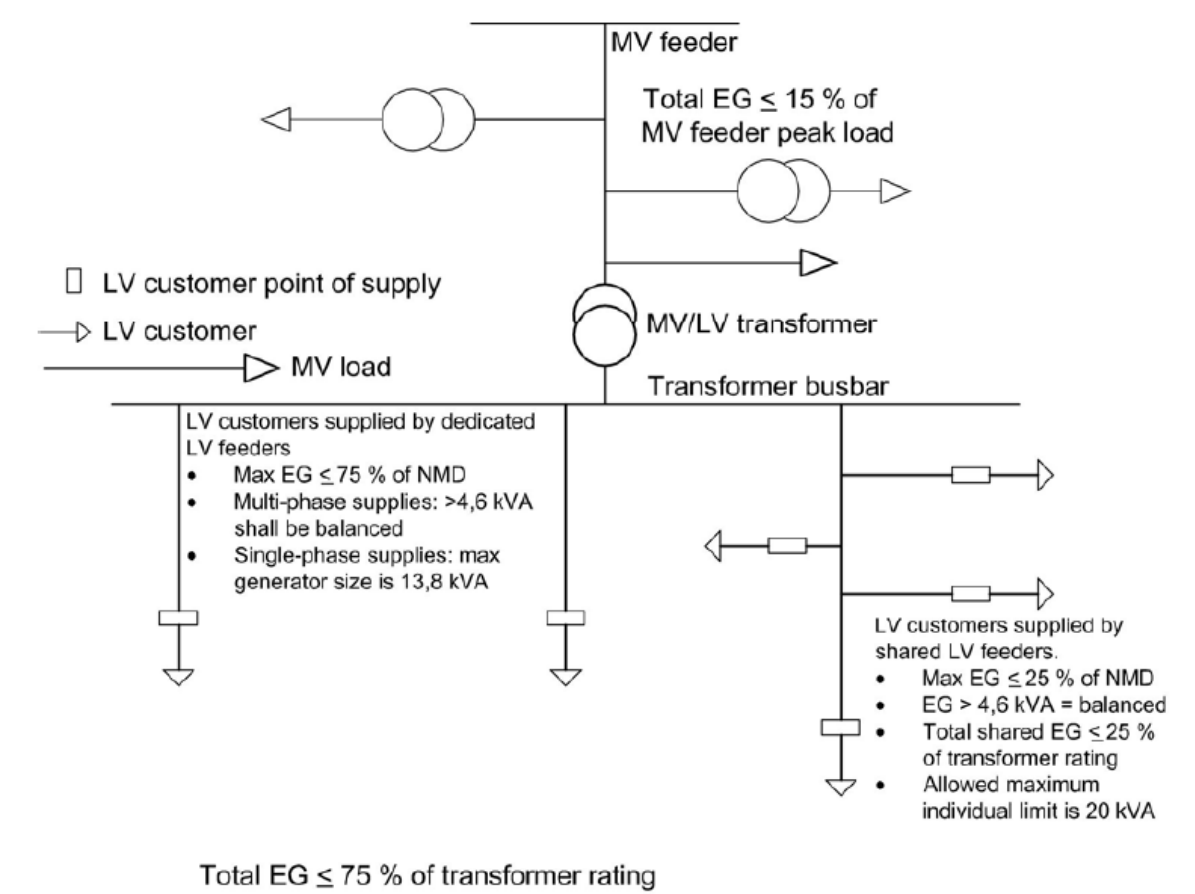
Simplified Connection Criteria

Flowchart

Basic checks

If not met – Detailed Grid Studies

3. NRS 097-2-3 Summary



2. Background of SANS 10142-1-2

- The SANS 10142-1: Wiring of premises; LV Installations
- Requirements for embedded generation or parallel (co-generation) NOT included; SANS 10142-1-2 (Requirements for LV SSEG installations) was created .
- Focus on small scale (<1000kVA) grid connected embedded (EG) or distributed generation; with emphasis on solar PV.
- Document >5 years in the making

3. Implication for Industry

- Provide clarity on “Gray” or unknown areas including; protective equipment, conductor selection and sizing, labelling, earthing, test reports, lightning protection, etc.
- It will increase the safety of installations and help level the playing field for installers
- Removes the need for a Pr. Person to sign off on the electrical installation itself.
- Not all aspects addressed in detail; Hybrid, storage and new technologies to be expanded on in future

3. Status quo and possible next steps

- The draft SANS 10142-1-2 has been circulated for public comment for a second time with closing date early June 2021
- Work group to convene end of June 2021 to start processing comments
- Once comments are addressed, document will go out for publication.
- Possible timeline (opinion)
  Comments processed by end of 2021
  Published by mid 2022

3. Status quo: Scope

- SANS 10142-1-2: Additional Special requirements for low voltage small scale embedded generation installations connected to THE GRID

- Applies to the installation of:
  - Solar PV installations
  - Energy Storage systems
  - Inverter-based generation
  - Synchronous generators
  - Asynchronous /induction generators
  - Any combination of the above connected to a single point of supply

3. Status quo: Scope

- SANS 10142-1-2: Additional Special requirements for low voltage small scale embedded generation installations connected to THE GRID

- Not applicable
  - Stand Alone of Off Grid electrical generation systems like solar PV or wind turbines as this is covered in clause 7.12 of the SANS 10142-1.
  - Structural requirements covered by the SANS 10400 series

3. Status quo: AC and DC protection

- Applicable Standards for solar PV components:
  - Distribution boards – SANS 61439-2 and SANS 60670 relevant part
  - DC circuit breakers – SANS 60947-2
  - DC fuses – SANS 60269-6
  - PV Connectors – IEC 62852
  - Surge Protection Devices (AC) – SANS 61643-11
  - Surge Protection Devices (DC) – IEC 61643-31

3. Status quo: AC and DC protection

- Distribution Boards and Wireways
  - AC and DC to be mechanically separated if same DB
  - Class II assembly is required for DC installation above Vmax =60V
  - Assembly insulation according to SANS 61439-1 and SANS 1973-1

- Specific labelling requirements apply

- Earthing the same size as DC cable size; for
  - bonding
  - reduction of static and
  - monitoring

3. Status quo: AC and DC protection

- DC: Overcurrent vs reverse current protection for PV
  - To be used for installations with 3 or more PV strings in parrallel
  - Rated at 1.56 x Isc
  - Must be DC rated (gPV)
  - Both positive and Negative
- Separate DC Switch disconnector to be installed
- SPDs
- (Opinion) Installation and placement of DBs

TAKE HOME MESSAGES

A few points to remember

1. The SANS 10142-1-2 compliments the base document.

2. Will increase safety and level the playing field for installers

3. Should be updated and expanded further

Thank you

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OR www.sseg.org.za

Questions?

SOLAR TRAINING CENTER SA

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Promoting safe quality Solar PV installations