

<b>Engineering Instruction</b> <b>Electrical Distribution Unit</b>	<b>EI D 17-23 V2.0</b>
<b>Approved by:</b> Paul Poynton, A/Professional Head Electrical Engineering, Sydney Trains  <b>Authorised by:</b> Jonathon McKinnon, Engineering Technical Publications Manager, Sydney Trains	<b>Date in Force: 1 August 2018</b> <b>Date Expires: 30 November 2018</b>
This Engineering Instruction includes urgent engineering information. Adherence to the information in this Instruction is <b>MANDATORY</b> .	
<b>WHVI Numbering Prefix</b>	
<b>Audience:</b> <ul style="list-style-type: none"> <li>• Network Maintenance Division</li> <li>• Major Works Division</li> <li>• Engineering System Integrity Division</li> <li>• Electrical System Operators ICON</li> <li>• Authorised Persons</li> <li>• Operational readiness TfNSW</li> </ul>	<b>Main Points:</b> <ul style="list-style-type: none"> <li>• Informing of change of WHVI prefix to 'T' and Emergency WHVI prefix to 'ET'</li> </ul>
<b>Primary Affected Documents:</b> <b>SMS-06-EN-0561 Working High Voltage Instruction</b> <b>PR D 78103 Electrical Operational Communication and Records</b>	

## Scope

To advise changes to the prefix designations for both standard and Emergency WHVI numbering as 'T' only and 'ET' only respectively.

## Background

With the introduction of Electrical Isolation Management System (EIMS), only a single prefix may be used for all WHVIs. A 'W' prefix was originally selected to replace the non-Emergency WHVIs developed through EIMS. It has been realised that selection of a 'W' prefix has introduced a few difficulties in the ability to effectively communicate the prefix 'W' between field personnel and Electrical System Operators.

The WHVI numbering has traditionally been prefixed by a:

- 'T' – Transmission Ariel
- 'U' – Underground Cable
- 'C' – Concentric Cable
- 'E' – Emergency

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These prefixes were originally used to identify a WHVI as being related to a particular type of asset. The asset type has evolved from being of the same type for a HV feeder into a blend of defined types on the same feeder identity.

In addition, it has been discovered that under the current numbering system for both Authority and WHVI that it is possible to have both an Emergency WHVI and Emergency Authority with the same number being enforced at the same time. This could lead to confusion and error when communicating which document is being discussed.

A review by Human Factors and workshops were conducted to determine the most appropriate selection for a sole WHVI prefix to address the communication issues experienced by field personnel and Electrical System Operators and to also address the concern of having both an Emergency WHVI and Emergency Authority with the same number at the same time. A final workshop was conducted to review the preferred options for prefixes and discuss which would be the best choice. The group determined that the 'T' prefix was the strongest candidate for its least likeliness to be miscommunicated verbally or when written, misinterpreted as something other than the letter T.

## Action required

All standard WHVIs are to be numbered using 'T' as the prefix, for example: T306/14 for the 306th WHVI of the year 2014. It is to be understood that there is no meaning associated with the 'T' as a prefix other than as being used as a unique identifier for a WHVI.

All Emergency WHVIs are to be numbered using a 'ET' for a prefix, for example: ET62/15 for the 62nd emergency WHVI of the year 2015

## Contact

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<b>Engineering Instruction</b> <b>Electrical Distribution Unit</b>	<b>EI D 16-12 V2.0</b>
<b>Approved by:</b> Paul Poynton, A/Professional Head Electrical Engineering, Sydney Trains  <b>Authorised by:</b> Jonathon McKinnon, Engineering Technical Publications Manager, Sydney Trains	<b>Date in Force: 1 August 2018</b> <b>Date Expires: 30 November 2018</b>
This Engineering Instruction includes urgent engineering information. Adherence to the information in this Instruction is <b>MANDATORY</b> .	
<h2>WHVI and 1500 Volt Authority Token System</h2>	
<b>Audience:</b> <ul style="list-style-type: none"> <li>• Network Maintenance Division</li> <li>• Major Works Division</li> <li>• Electrical System Operators ICON</li> <li>• Authorised Persons</li> <li>• Operational readiness TfNSW</li> </ul>	<b>Main points:</b> <ul style="list-style-type: none"> <li>• APM to forward a copy of the WHVI/1500V Authority to ICON to verify the verbal clearance when cancelling the WHVI/Authority</li> <li>• ICON to confirm all permits cancelled prior to energisation</li> </ul>
<b>Primary affected documents:</b> <b>SMS-06-EN-0561 Working High Voltage Instruction</b> <b>SMS-06-EN-0567 1500V Authority</b> <b>PR D 78103 Electrical Operational Communication and Records</b>	
<b>This Engineering Instruction supersedes EI D 15/20 with immediate changes to the WHVI and 1500V Authority Process</b>	
This Engineering Instruction shall be read in conjunction with SMS-06-EN-0561 Working High Voltage Instruction, SMS-06-EN-0567 1500V Authority and PR D 78103 Electrical Operational Communication and Records	

## Scope

To strengthen the restoration process between the Authorised Person Mains (APM) and the Electrical System Operator (ESO) for Working High Voltage Instructions (WHVI) and 1500 Volt Authority's

## Background

An incident occurred when a high voltage feeder was energised while an electrical permit to work was in force. This caused the circuit breaker to trip. No injuries were reported as a result of this incident. An investigation was completed with corrective actions progressing. This incident exposed a potential for error in the power restoration process of the verbal clearance between the Authorised Person Mains (APM) holding the WHVI-1500 Volt Authority and the Electrical System Operator (ESO) at ICON.

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## Action required

### 1. Electrical Operational Communication and Records

- Each ESO desk at ICON shall be issued a hardbound notebook. This shall be utilised for all notes relating to the electrical network that are not immediately recorded onto ESO Log Sheets. On shift changes, the relieving ESO shall note their name, the date and time on the next available line in the notebook. The notebook shall be retained in accordance with Sydney Trains records management policy.
- ESOs shall have the ICON copy of the WHVI/1500V Authority in their possession when undertaking operational communication related to that WHVI/1500V Authority.
- APM's and AO's undertaking Operating Work in relation with a planned WHVI/1500V Authority shall have an approved field copy of the WHVI/1500V Authority for verification of switching operations. The APM's and AO's undertaking Operating Work must confirm with the ESO that the instructions match the written instructions that they have. For undocumented switching the APM's or AO's must record the instructions in writing and repeat back to the ESO for confirmation.

### 2. Clearance to restore WHVI/1500V Authority

- (a) The APM shall forward a copy of the back of the field WHVI/1500V Authority listing the cancelled permits to the ESO on [EOCOperator@transport.nsw.gov.au](mailto:EOCOperator@transport.nsw.gov.au) and then contact the ESO to confirm that all permits have been cancelled and Working Earths/Rail Connections removed

**NOTE:** All APM and all Authorised Operators involved in planned isolations shall possess devices capable to wirelessly create, send, and receive an electronic image and have access RailSafe website.

The type of files that can be utilised are either:

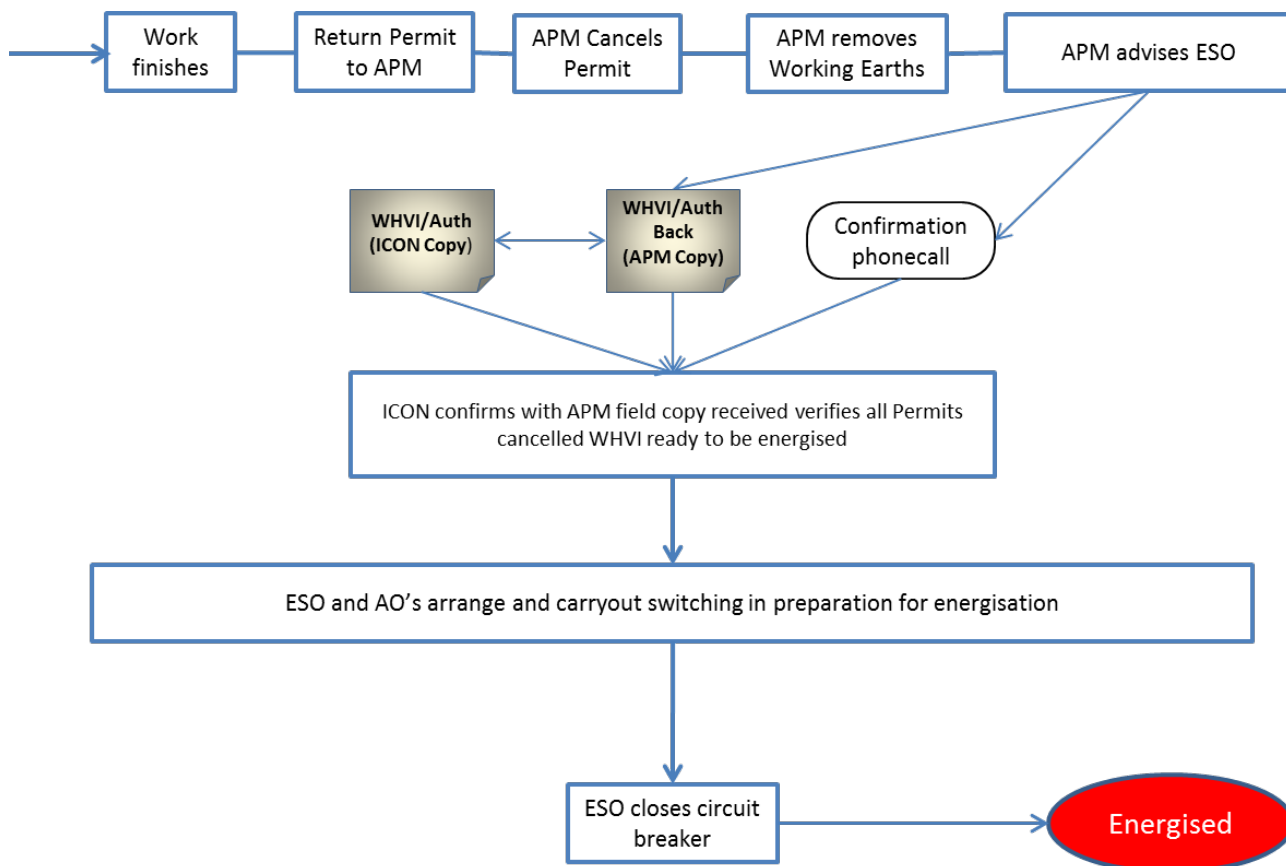
- a photograph with sufficient resolution to allow clear reading of the information detailed on document or,
- a PDF scan with a minimum resolution of 200dpi.

- (b) **If the APM cannot forward a copy of the back of the field WHVI/1500V Authority listing the cancelled permits to ICON.**

- The APM in charge of the WHVI/1500V Authority shall contact the ESO and advise of the,
  - WHVI/1500V Authority number
  - the individual permit and operating agreements
    - number
    - cancelled by
    - time and date
- Should the WHVI/1500V Authority be cancelled the cancellation details are also to be advised.
- The ESO shall record all of the details onto the rear of ICON copy of the WHVI/1500V Authority form with a note as too advised by whom and repeat the information back to the APM for confirmation.

### 3. When advised of clearance to restore supply the ESOs shall:

- Verify the name of the person giving clearance, against the recorded person in charge of the WHVI/1500V Authority.
- Highlight and initial adjacent the WHVI and feeder number or 1500V Authority number, on both the ICON and the emailed back of the field copy of the WHVI/1500V Authority. If verbally advised highlight and initial the back of the ICON copy of the WHVI 1500V Authority with the details of the cancelled permits.
- Verify the advice received by the APM that all Permits have been cancelled.
- Attach the printed copy of the emailed field WHVI/1500V Authority back page to the ICON copy.
- Follow ENSR requirements for arranging the restoration supply to the equipment.



## Contact

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Engineering Procedure  
Electrical Distribution Unit

PR D 78103

# Electrical Operational Communication and Records

Version 1.1

Date in Force: 6 June 2018

# Procedure

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## Document control

Version	Date	Author/ Prin. Eng.	Summary of change
1.0	28 April 2015	Chris Leung	First issue as a Sydney Trains document, rebranded from previous RailCorp SMS-06-EN-0668 V1.2
1.1	6 June 2018	Chris Leung	3 yearly review completed no technical changes made

## Summary of changes from previous version

Summary of change	Section
<i>NOTE – If the final document is small enough for the 'Contents' and 'Document control' to fit on one page remove the page break between the existing pages 2 and 3. HOWEVER if the 'Document control' page carries over to a second page separate pages must be used for 'Contents' and 'Document control'</i>	
<i>If there are no changes or they are so minor that they will fit in the above table delete this table and its heading.</i>	

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# 1 Purpose and Scope

To set out the requirements for operational communication relating to electrical safety matters. It applies to:

- Written communication (forms, Permits, etc); and
- Voice communication (radio or telephone)
- Electronic communications (email, sms, facsimile etc)

This procedure is also applicable to direct voice communication where the parties are physically separated. It also applies to the recording of voice communications.

This procedure also sets out the responsibilities for workers and the requirements for training.

This procedure is applicable to all workers, employees or contractors, who carry out Rail Safety Work on electrical equipment operated and maintained by Sydney Trains.

## 2 Responsibility

### 2.1 Managers & Supervisors

Managers & Supervisors shall:

- Assess the communication requirements associated with work and ensure that the necessary communication equipment is available.
- Ensure all workers required to use communication equipment are competent in the required skills and hold any necessary qualifications in accordance with section 3.
- Ensure that workers comply with the instructions pertaining to the system of communication used.

### 2.2 Workers

Workers shall:

- (a) Comply with the requirements of this procedure.
- (b) Check that their communication equipment is available and is in working order before, during, and after use.
- (c) Ensure the correct use, care, maintenance, and storage of communication equipment.
- (d) Seek guidance and/or supervision if they have not demonstrated and maintained satisfactory competence on complying with the requirements of this procedure.

## 3 Training

Training in communications is provided in conjunction with the training in the area to which the communications relate.

Training may take place on the job or in a specialised training environment. Workers in training shall be supervised by a person competent in the skill being learned.

Competency in skills that are not practised is lost in time. Where competency is not maintained through practice, the skill shall be revised and assessed prior to the person again being considered competent.

## 4 Hazards

Failure to accurately communicate safety critical information, such as electrical operations, could result in serious injury or fatality involving workers and/or members of the public.

Operational communication requires concentration and workers should not carry out operational communications whilst doing other safety critical tasks that also require full concentration such as driving a motor vehicle or walking on running lines.

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### NOTE



The NSW Road Rules incorporate particular rules applicable to the use of mobile phones within vehicles. You are required to comply with and make yourself familiar with those particular rules.

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## 5 Voice Communications

### 5.1 Communications Equipment

Equipment for two way voice communication includes:

- landline telephones i.e. a telephone connected to the public switched telephone network (PSTN);
- voice over internet protocol (VoIP) phones;
- two way radios;
- satellite telephones; and
- mobile telephones;

Some types of equipment provide a closed channel where others cannot listen or interrupt. Telephones are an example of this type of system.

Other types of communication equipment provide an open channel that others can listen to and interrupt. Two way radios are an example of this type of system. Additional care shall be taken when open channels are used for operational communication.

Open or closed channel communications equipment may be more suitable for a particular application and where possible the most appropriate system should be selected for the communication task.

### 5.2 Use of Telephones During Lightning Storms

There is a risk of receiving an electric shock when using a landline telephone during lightning storms. The risk, though low, may occur because the landline telephone exchange earth may be at a different potential to the electricity supply substation earth.

Within a substation use of the VoIP phone or supervisory phone is preferred as it is not part of the PSTN.

## 5.3 General Communication Safety

Communications equipment shall be used correctly to ensure safety. Workers shall:

- use communications equipment that is in good working order;
- give priority to emergency messages, safeworking and other rail transmissions in that order;
- use the correct identification when initiating or acknowledging transmissions;
- make transmissions so that they may be understood, are concise, and related to the task at hand;
- promptly acknowledge messages received;
- not transmit any false or irrelevant messages;
- use standard communication terms;
- when a message or standard communication term is not clear, use the phonetic alphabet and spoken numbers to avoid confusion;
- transmit by speaking in a natural rhythm, use normal tone, divide message into phrases, and speak at a slightly slower rate than used in normal conversation.

## 5.4 Emergency Messages

### 5.4.1 Requirements

Emergency messages shall:

- be given priority over other transmissions
- be answered immediately.

Emergency messages shall only be sent when:

- there has been an accident involving injury such as an electric shock
- the passage of a train is endangered
- a condition exists that is hazardous, and requires an immediate response.

### 5.4.2 Transmitting an Emergency Message

When required to transmit an emergency message, especially by radio (unless the radio is fitted with an emergency call facility), the worker shall:

- first say “Emergency, Emergency, Emergency”

Then state:

- identification and location
- the nature of the emergency
- the type of assistance required.

## 5.5 Testing Communication Equipment

Workers responsible for using communications equipment for operational or safety communication shall regularly test the equipment to establish that it is functioning

correctly, and where applicable, ensure that the equipment is taken to the worksite, switched on and ready for use.

For battery operated equipment, care should be taken to ensure the batteries are fully charged and if necessary, sufficient spare batteries are provided.

Equipment to be tested and checked includes:

- radios fitted to mobile units, e.g. overhead wiring vehicles, road/rail track vehicles or machines
- hand-held portable radios, satellite or mobile telephones
- base station radios
- any radio, satellite or mobile telephone being carried as a spare or back up.

## 5.6 Transmitting Messages using radio

When transmitting messages, the following process shall be used:

- On an “open” radio channel, listen for a sufficient interval to ensure that the channel is not being used.

Offer the message:

- called party (identification), from calling party (identification), OVER.

Make contact:

- called party, receiving calling party, OVER.

Exchange of messages:

- each party shall exchange messages clearly without ambiguity using OVER at the end of each transmission.

Sign off:

- each party shall complete transmission of their message with the word OUT.

### **WARNING**

**If the worker acknowledging the message does not identify themselves correctly, the worker transmitting the message shall request correct identification before proceeding with the transmission.**

## 5.7 Receiving Messages

When receiving a message, the called party shall not delay in acknowledging the message unless it interferes with duties that relate to safety.

If the receiver does not receive the beginning or the end of a message, the receiver shall request that part of the message be repeated by asking the sender to “Say again all before ... “ or “Say again all after ... “.

Directive messages relating to the removal or restoration of electrical supply or other electrical switching shall be recorded in writing or checked against an existing document; and repeated back by the worker receiving the message to the worker transmitting it.

The repeating back of electrical switching messages shall include all switch numbers, section/subsection number, location numbers, and all descriptions of operations required to be carried out or have been conducted such as:

- *“I have Removed Earths, DANGER Tags, and Made Ready For Service the No 1 Rectifier Unit at Waverton Substation.”*
- *“As per Authority 37/2013 I have removed special lock and DT’s, OPEN from RAIL and CLOSE with standard lock 1500 Volt switches 621 and 622 at Waverton Substation.”*

**WARNING**

**Instructions shall not be carried out unless the transmitter has confirmed that the instruction has been received correctly.**

**Any communication that is not fully understood shall not be acted upon until clarification of the message is received and agreed to by both the transmitter and the receiver.**

## 5.8 Identifying Yourself

When transmitting a message or making contact, a unique identification shall be used. When available, the following identification shall be used to make positive identification in the order listed below:

For electrical switching:

- name
- organisation
- title
- present location (Substation name, Sectioning hut name, Overhead Wiring structure number or Pole number)

## 5.9 Standard Communication Terms

In order to reduce the possibility of confusion, standard communication terms shall be used to convey meanings as follows:

Term	Meaning
Receiving	I (called party) acknowledge your call, proceed with the message.
Message received	I have received your message and I understand it.
Over	I have finished speaking and I am waiting for a reply.
Out	My transmission has been completed.
Correct	You are correct or what you have transmitted is correct.
Negative	No, or permission is not granted, or there is an error in your read back.
Standby	Wait, I will be back soon.
Read back	Repeat all, or the specified part, of this message exactly as you received it.
I read back	I repeat all, or the specified part, of this message exactly as I received it.
Say again	Please repeat your last message.
I say again	I repeat all, or the specified part, or my last transmission.
I spell	I am about to spell a word or words using the phonetic alphabet.
Speak slower	Speak more slowly, it is hard to understand you.
Roger	All your last message is received and is understood.
Loud and clear	Your signal is strong, every word is understood.
Emergency, emergency, emergency	An emergency message follows. Cease other communications on this channel. Listen carefully.

## 5.10 Phonetic Alphabet

To avoid confusion between words and ensure that a message is transmitted clearly, the phonetic alphabet shall be used to spell out the letters of the words.

The letters of the English alphabet, their phonetic names and pronunciation are as follows:

Letter	Phonetic Name	Pronounced	Letter	Phonetic Name	Pronounced
A	ALPHA	AL fah	N	NOVEMBER	no VEM ber
B	BRAVO	BRAH VOH	O	OSCAR	OSS cah
C	CHARLIE	CHAR lee	P	PAPA	pah PAH
D	DELTA	DELL tah	Q	QUEBEC	key BECK
E	ECHO	ECK oh	R	ROMEO	ROW me oh
F	FOXTROT	FOX trot	S	SIERRA	see AIR RAH
G	GOLF	GOLF	T	TANGO	TANG go
H	HOTEL	Hoh TELL	U	UNIFORM	YOU nee form
I	INDIA	IN dee ah	V	VICTOR	VIC tah
J	JULIET	JEW lee ETT	W	WHISKY	WISS key
K	KILO	KEY loh	X	X-RAY	EKS ray
L	LIMA	LEE mah	Y	YANKEE	YANK key
M	MIKE	MIKE	Z	ZULU	ZOO loo

To use the phonetic alphabet, the words “I spell” shall precede the words to be spelt out and the words shall be spelt in full, e.g.

“ ... signal: I spell, S for SIERRA, I for INDIA, G for GOLF, N for NOVEMBER, A for ALPHA, L for LIMA”.

## 5.11 Spoken Numbers

When a message contains numbers, the digits of each number shall be pronounced separately to ensure clarity.

- When numbers consist of two or more digits, each digit shall be pronounced separately, e.g. 45, “FOUR, FIVE”; 219, “TWO, ONE, NINE”; 6837, “SIX, EIGHT, THREE, SEVEN”.
- When the digit “0” appears in a number, it shall be pronounced as “ZERO”, e.g. locomotive 8063 would be pronounced as “locomotive EIGHT, ZERO, SIX, THREE”.
- When a number consists of only one digit, it may be necessary to spell the number using the phonetic alphabet, e.g. 2, “I spell, T for TANGO, W for WHISKY, O for OSCAR”.

## 5.12 Saying the Time

Always use the 24 hour clock system when communicating times. Do not use times before the hour eg "twenty to eight". Use "07:40.hours".

## 5.13 Voice Recording at ICON

All telephone communications with the Electrical System Operators of ICON are recorded. This applies to all calls that are answered from any of the operating desks.

The recordings may be retrieved if there is any safety-related incident involving communication with the ICON.

The calls may also be monitored to verify the quality of recording.

## 6 Written Communications

When completing safety documentation, such as Electrical Permits and other safety forms, the following requirements shall be complied with:

- All entries, other than signatures, shall be printed. Care shall be taken to make the writing clear and legible.
- All entries shall be completed firmly using a ballpoint pen.
- Where a signature is required, the person shall sign in their normal signature.
- All times shall be shown using the 24 hour clock system.
- All deletions shall be made by neatly crossing out the words to be deleted in a manner that, as far as possible, does not totally obscure them. The deletion shall be initialled and dated by the person making it.

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### NOTE



Particular Electrical Network Safety Rules (ENSR) instructions have restrictions documented within the instruction on the making of alterations or deletions to some forms. These restrictions shall be complied with.

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## 7 Electronic Communications

Equipment for electronic communication includes:

- Computers
- Cameras, Video
- Facsimile, Scanners
- Smart Phones, Tablets

When transmitting safety documentation by an electronic communication means, the following requirements shall be complied with:

- The document shall be in an un-editable electronic format such as a fax or email containing a locked PDF file.
- Upon successfully transmitting the document, the sender shall immediately contact the recipient with voice communication to verify that the recipient has received the document. (Where practicable, email tracking options may be used to assist in tracking electronic communication. Email tracking options are not a substitute for voice communication.)



## 8        **References**

<i>Network Rules NGE 204</i>	<i>Network communication</i>
<i>Network Procedures NPR 721</i>	<i>Spoken and written communication</i>
<i>SMS-10-SP-3070</i>	<i>Communication and Consultation</i>
<i>PR D 78000</i>	<i>Electrical Network Safety Rules (ENSR)</i>