



Independent Pricing and Regulatory Tribunal
New South Wales

Electricity networks audit guideline – Safety management systems audits



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ISBN 978-1-76049-142-0

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Amendment record

Issue	Date issued	Summary of amendments made
ENRAG - original	June 2016	First release of final Audit Guideline.
ENRAG v2	May 2017	Addition of Ms Deborah Cope as a Committee member, replacing Ms Catherine Jones. Amendments to Chapter 3 and appendix A regarding audit process. Addition of section 3.5.5. Removal of section 3.7.1 from previous version. Various amendments unrelated to safety management system audits.
ENRAG v3	May 2017	Amendments to Chapter 5 – electricity network safety management system audits and Appendix B.
ENRAG – safety management systems	October 2017	Separate Audit Guidelines published. Minor wording changes to improve clarity.

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1 Electricity network safety management system audits

This document addresses the general requirements for external audits, undertaken at the direction of IPART, of a Network Operator's Electricity Network Safety Management System (ENSMS) in compliance with the *Electricity Supply (Safety and Network Management) Regulation 2014* (the ESSNM Regulation). All network operators are required to have an ENSMS under the ESSNM Regulation.

These audits assess the adequacy and the implementation of the network operator's ENSMS. Each ENSMS is required, under the ESSNM Regulation, to deal with specific matters and be in accordance with Australian Standard AS 5577¹. The requirements of the ESSNM Regulation and AS 5577 (the latter being supported by reference to AS/NZS ISO 31000) are the basis of the audit criteria against which an auditor would test the audit evidence to determine whether the ENSMS meets the regulatory requirements.

The audit scopes will be determined by the Tribunal, may be broad or narrowly focused, and may vary between network operators. The scope of an ENSMS audit will dictate whether all or some of the audit criteria identified in this document and relevant appendices are applicable to an audit. Audits may use historical evidence to confirm aspects of the ENSMS implementation where necessary.

All audits must be carried out in accordance with this Guideline and IPART's *Audit Guideline – Audit fundamentals, process and timing*.

1.1 Objective

The ESSNM Regulation requires that 'a network operator must take all reasonable steps to ensure that the design, construction, commissioning, operation and decommissioning of its network (or any part of its network) is safe' (clause 5). The primary objective of an ENSMS is to assist the network operator to comply with the requirement in clause 5 of the ESSNM Regulation and to support:

- ▼ the safety of members of the public
- ▼ the safety of persons working on networks
- ▼ the protection of property (whether or not belonging to a network operator)
- ▼ the management of safety risks arising from the protection of the environment (for example, preventing bush fires that may be ignited by network assets), and
- ▼ the management of safety risks arising from loss of electricity supply.²

IPART's role is to hold each network operator to account to the requirements identified in the ESSNM Regulation. The objective of an audit of the ENSMS is to provide IPART, the

¹ ESSNM Regulation, clause 7.

² ESSNM Regulation, clause 6.

NSW Government and the people of NSW with a level of independent assurance that the network operator's ENSMS, or any part thereof, meets with the primary objective as specified in the ESSNM Regulation.

1.2 Scope

IPART may require an audit to relate to specified aspects of a network operator's ENSMS.³ Where IPART chooses to do this, the aspects of the ENSMS to be audited and the audit criteria⁴ to be tested will be specified by IPART in an audit scope. The auditor shall then develop an audit proposal identifying how the audit criteria will be tested against the audit scope.

Focused audit scopes may address specific aspects of the ENSMS such as:

- ▼ bushfire risk management
- ▼ public electricity safety awareness, or
- ▼ safety and reliability of the network.

1.3 Specific auditor expertise

Each ENSMS audit may require specific expertise, dependent on the scope, eg, an audit of bushfire risk management will require expertise in asset management and vegetation management in relation to bushfire risk. IPART will identify the particular expertise that nominated auditors will be required to demonstrate in order to undertake an audit of particular scope.

1.4 Audit timing

The timing and frequency of ENSMS audits is to be determined by IPART and may involve prior discussion with the auditees.

1.5 Criteria

The minimum audit criteria to test compliance with each relevant clause within the ESSNM Regulation, and AS 5577 are identified in Appendix A. The audit criteria have been grouped into 'Planning and preparation of the ENSMS', 'Implementation of the ENSMS', 'Measurement and evaluation' and 'Management review and change management'.

Auditors should clearly identify the audit criteria that are to be tested for each proposed audit in the audit proposal. Where auditors seek to deviate from the audit criteria specified by IPART, they should identify this explicitly in the audit proposal and provide reasons. This includes adding additional audit criteria as required.

Under each audit criterion, the tables in Appendix A list the clauses of the ESSNM Regulation and sections of the standards that are relevant and must be complied with.

³ Clause 11 (5).

⁴ see Appendix A for general audit criteria

Unless otherwise agreed, auditors must test compliance with each clause or section specified in the audit criteria as they apply to the part of the ENSMS being audited.

Auditors are expected to clearly identify the evidence reviewed to test compliance with the audit criteria. It is recommended that the auditor record this in a table form for each criterion tested and include the table in the audit report. The auditor is to use professional judgement, consistent with the requirements of Australian or International audit standards to determine what is appropriate evidence and whether compliance has been demonstrated.

1.5.1 Assessing the appropriate level of risk control

We rely on the auditors to be well versed in electricity network operations and risk mitigation options. We rely on their expert opinion to assess whether network operators have undertaken risk assessments and established the reasonableness of the risk treatment options implemented.


The ESSNM Regulation requires that all reasonable steps be taken to ensure that the network is safe. This acknowledges that it is neither possible nor desirable to eliminate all risk, however, where it is reasonable, risks should be eliminated and where this is not reasonable, risks should be reduced.

The ESSNM Regulation also requires that all the networks have in place an ENSMS that is in accordance with AS 5577. AS 5577 requires hazards and their associated risks to be eliminated if reasonably practicable to do so, and if not, for controls to be implemented that reduce residual risks of a hazard to 'as low as reasonably practicable'. That is, that network operators consider all options and implement further reasonable practicable risk reduction options even if they have reduced risks to established tolerable criteria.

An assessment of whether control options are reasonably practicable should be documented and take into account what is reasonable in the circumstances to achieve the optimal overall safety outcomes for the network. We consider that in making this assessment, relevant matters must be considered, and this includes:

- ▼ The likelihood of the event occurring.
- ▼ The potential consequences if the event occurs, where more serious consequences may be justification for greater expenditure on a control even if the likelihood is low.
- ▼ All available options for hazard control, including accepted industry practice, relevant codes of practice, guidelines and standards, and any technological advances or innovative practices. The hierarchy of controls⁵ should be applied when assessing which control the network should pursue.
- ▼ Information gathered through consultation with internal and external stakeholders.
- ▼ The interdependencies between hazards and risk controls and the impact a proposed control has on the effectiveness of other controls and operations.
- ▼ An assessment of the cost of implementing the proposed control compared to the safety benefit expected from the control. This includes not just financial costs, but also efficiency gains or losses, opportunity costs and other costs.

⁵ As described in section A4 of AS 5577.



There should be a formal argument as to why particular controls for significant hazards⁶ have been selected, and why the cost of implementing controls higher in the hierarchy of controls were considered to be ‘grossly disproportionate’ to the benefit expected.

Processes should be established for ongoing review of hazards and controls and for the implementation of changes as they are deemed necessary.

1.6 Additional requirements of audit

When directing a network operator to undertake an ENSMS audit, IPART may have additional criteria to be assessed, or specific procedures that must be undertaken. These requirements will be outlined in the scoping document.

The content of audit reports must also comply with the requirements of clause 11(4) of the ENSMS Regulation.

⁶ IPART considers a significant hazard to persons to be one with kill or maim potential. It is left to the network operator to determine what it considers a significant hazard to property or reputation.



Appendices



A Audit criteria for electricity networks safety managements systems audits

Table A.1 Planning and preparation of the ENSMS

Minimum criteria ^a	Auditor's comments
<p>1. The network operator can demonstrate that the network's policy and commitment to the ENSMS has been defined and that the network operator has committed to specific outcomes.</p> <p>IPART considers that in order to plan and prepare a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) the ENSMS complies with AS5577 4.2. 	
<p>2. The ENSMS supports the objectives and addresses the fundamental requirements of a compliant ENSMS.</p> <p>IPART considers that in order to plan and prepare a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) the ENSMS supports clause 5 and the objectives of an ENSMS as described in clause 6 of the ESSNM Regulation b) The ENSMS deals with the required content of an ENSMS in compliance with clause 7 of the ESSNM Regulation c) The ENSMS meets the general requirements of an ENSMS in compliance with clauses 4.1 and A1 of AS5577, and d) The ENSMS meets the planning requirements in compliance with clause 4.3 of AS5577 and the processes, procedures and methodologies required under clause 4.3.2 are documented. 	
<p>3. The network operator must identify the standards and codes used by it and shall document decisions not to comply with these standards and codes and the reasons for that decision.</p> <p>IPART considers that in order to plan and prepare a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) the requirements of clause 4.3.4 of AS5577 have been complied with and documented in the ENSMS. 	
<p>4. The context of the ENSMS has been established as it relates to the specified aspects of the audit.</p> <p>IPART considers that in order to establish the context of a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) Internal and external stakeholders have been identified for the relevant stages of the Formal Safety Assessment development in compliance with clause A1(d) of AS 5577 to provide for the necessary consultation, communication and reporting prescribed under clause 4.4.6 of AS5577. 	

Minimum criteria ^a	Auditor's comments
<p>b) A description of the network, including or referencing suitable maps showing all network assets and the location of associated facilities has been documented, in compliance with clause 4.1 of AS 5577 and with reference to Appendix C (although Appendix C is informative and not mandatory, IPART considers that network operators should consider the guidance provided as good practice for describing the network).</p>	
<p>5. The Formal Safety Assessment (FSA) has identified electricity network hazards that could cause an electricity related incident.</p> <p>IPART considers that in order to thoroughly identify all reasonably foreseeable electricity network hazards in a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) The electricity hazards have been identified in compliance with clause A3.1 of AS 5577. b) All stakeholders identified have been involved in the risk identification process in compliance with clause A1(d) of AS 5577. c) The network operator has a process to facilitate an ongoing dialogue with the Australian and international electricity network industry to understand emerging safety issues and themes. (Generative interviews with staff and workers, discussion with regulators and review of issues arising nationally and internationally.) d) The network operator has processes to ensure that emerging risks are identified and addressed through the FSA process in a timely manner. 	
<p>6. The Formal Safety Assessment has analysed risks associated with all identified electricity network hazards that could cause an electricity related incident.</p> <p>IPART considers that to adequately analyse risks in a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) The electricity risks have been analysed in compliance with clause A3.2 of AS 5577. b) All possible reasonably foreseeable consequences of the significant hazards identified have been articulated and assessed at an appropriate level of granularity. c) A completeness check has been undertaken, based on the network's particular operational zones, to ensure identification of hazards that may arise at or from specific assets in particular locations. d) A completeness check has been undertaken based on the network's functional units, comparing the interactions of: <ul style="list-style-type: none"> – identified hazards (including the loss of electricity supply) – critical exposed groups (eg, members of the public and persons working on networks) – other critical exposed elements (eg, property and the environment), and – all relevant phases (eg, design, construction, commissioning, operations maintenance and decommissioning), as well as abnormal and emergency situations. e) Uncertainty is explicitly addressed in compliance with clause 3(d) of ISO 31000. 	

Minimum criteria ^a	Auditor's comments
<p>7. Risk control measures and treatments have been identified and evaluated in accordance with the methodologies developed in the planning phase of the ENSMS.</p> <p>IPART considers that to adequately control, treat and evaluate treatment of risks in a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) The electricity risks have been treated and evaluated in accordance with A4 of AS5577. b) Recognized good practice has been identified and considered in the development of risk treatment options for each hazard regardless of whether the level of risk is considered 'tolerable' or 'ALARP'. c) If recognized good practice treatments are not put in place for a particular hazard, it must be demonstrated that recognised good practice has been tested for reasonableness. d) Where recognised good practice is not considered appropriate, reasoning must be provided, showing how the hazard is to be managed to an equal or better safety outcome by different means. e) Interdependencies of treatment options for other risks has been considered. This means there has been a holistic consideration of the impact that proposed measures may or will have on other proposed or implemented measures. f) The treatment or control approaches have been selected based on the best available information. g) An estimation of residual risks is clearly articulated for each hazard, in compliance with clause A3.2(c) of AS 5577. h) Control measures and treatments are consistent with the primary objective of clause 5 of the ESSNM Regulation. i) Uncertainty is explicitly addressed in compliance with clause 3(d) of ISO 31000. j) The network operator has processes to ensure that emerging technologies or other control options are identified and addressed through the FSA process in a timely manner. 	
<p>8. Control measures have been incorporated into the appropriate procedures.</p> <p>IPART considers that to finalise the preparation of a compliant ENSMS, evidence should be provided that:</p> <ul style="list-style-type: none"> a) control measures have been incorporated into the appropriate procedures in compliance with clause 4.3.2 of AS5577. 	
<p>9. Planning and preparation for abnormal operations has been demonstrated</p> <p>IPART considers that to demonstrate that abnormal circumstances have been planned and prepared for, evidence should be provided that the ENSMS complies with clause 4.3.3 of AS5577.</p>	

Note: Regulatory requirements are shown by reference to the source document (including the relevant clause number/s in the document), as follows:

The ESSNM Regulation refers to the *Electricity Supply (Safety and Network Management) Regulation* 2014

AS 5577 refers to the Australian Standard AS 5577 – 2013 Electricity Network Safety Management Systems

ISO 31000 refers to the Australian/New Zealand Standard AS/NZS ISO 31000:2009 Risk management – Principles and guidelines

a The minimum criteria are to provide guidance to an auditor on IPART's expectations of what would demonstrate that the requirements of the standard have been met. The auditor is to use their professional opinion, audit scope and Australian or International standards to determine what is appropriate evidence for the audit clause and where an electricity network operator may use an alternative to, or omit, the minimum criteria. The given criteria will apply unless amendments or additions are approved by IPART.

b The term "hazard" as used in AS 5577 is considered to be equivalent to the term "risk source" in AS/NZS 31000

Table A.2 Implementation of the ENSMS

Minimum criteria ^a	Auditor's comments
<p>1. The ENSMS contains the network operator's arrangements for implementation.</p> <p>IPART considers that in order to properly implement the ENSMS, implementation must be addressed within the ENSMS in compliance with clause 4.1 of AS 5577.</p>	
<p>2. Resourcing, equipment and material requirements for the network's safe operation have been identified.</p> <p>IPART considers that in order to identify all resourcing equipment and material requirements required to implement the ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) the requirements of AS 5577 clause 4.4.2 have been met b) the resourcing and management requirements have been identified and documented for normal, abnormal and emergency situations, and c) communication and reporting requirements regarding risk treatments have been identified. 	
<p>3. A defined management structure has been established and is appropriate to the size and complexity of the network.</p> <p>IPART considers that in order to properly implement the ENSMS, an appropriate management structure must be established in compliance with clause 4.4.3 of AS 5577.</p>	
<p>4. The appropriate responsibilities, accountabilities, and authority levels of personnel has been detailed in the ENSMS.</p> <p>IPART considers that in order to properly implement the ENSMS, responsibilities, accountabilities and authorities must be established in compliance with clause 4.4.4 of AS 5577.</p>	
<p>5. All persons involved in the design, construction, commissioning, operation, maintenance and decommissioning of the networks are suitably competent and adequately trained to carry out their duties.</p> <p>IPART considers that in order to properly implement the ENSMS, staff must be suitably competent and adequately trained to carry out their duties in compliance with clause 4.4.5 of AS 5577.</p>	

Minimum criteria ^a	Auditor's comments
<p>6. The treatment options identified in the Formal Safety Assessment (FSA) must be implemented.</p> <p>IPART considers that in order to show that the treatment options identified in the FSA have been implemented and to meet the requirements of the ESSNM Regulation clauses 5 and 8, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) The FSA has been or is being implemented in compliance with clause 8 of the ESSNM Regulation. b) Where a control has not been implemented, the network operator should have a documented implementation plan including a reasonable timeframe, commitment to funding and management approval. The auditor should note where this is the case. c) The ENSMS has been brought to the attention of and made readily accessible to the persons involved in its implementation in compliance with clause 8 of the ESSNM Regulation. d) Where control treatments weren't implemented as per the FSA, an appropriate reason is provided and a suitable alternative was assessed and appropriately implemented. e) Processes are implemented to determine when the operation or activity ceases to be within normal operating parameters (ie, becomes abnormal operation). f) All reasonably practicable steps have been undertaken to prepare for abnormal operations, including emergencies. g) The network operator has effectively implemented its consultation, notification and accessibility procedures for its ENSMS and this process is ongoing. 	
<p>Note: Regulatory requirements are shown by reference to the source document (including the relevant clause number/s in the document), as follows:</p> <p>The ESSNM Regulation refers to the <i>Electricity Supply (Safety and Network Management) Regulation 2014</i></p> <p>AS 5577 refers to the Australian Standard AS 5577 – 2013 Electricity Network Safety Management Systems</p> <p>ISO 31000 refers to the Australian/New Zealand Standard AS/NZS ISO 31000:2009 Risk management – Principles and guidelines</p> <p>^a The minimum criteria are to provide guidance to an auditor on IPART's expectations of what would demonstrate that the requirements of the standard have been met. The auditor is to use their professional opinion, audit scope and Australian or International standards to determine what is appropriate evidence for the audit clause and where an electricity network operator may use an alternative to, or omit, the minimum criteria. The given criteria will apply unless amendments or additions are approved by IPART.</p> <p>^b The term "hazard" as used in AS 5577 is considered to be equivalent to the term "risk source" in AS/NZS 31000</p>	

Table A.3 Measurement and evaluation

Minimum criteria ^a	Auditor's comments
<p>1. Procedures are established for identifying, recording and analysing network operational, maintenance and reliability data to identify trends that may affect the safe operation of the electricity network</p> <p>IPART considers that in order to have adequate data analysis procedures in a compliant ENSMS, the network operator must demonstrate that the requirements of clause 4.5.1 of AS 5577 have been met.</p>	
<p>2. Incidents are appropriately reported and investigated, and procedures to determine corrective and preventative action are implemented.</p> <p>IPART considers that in order to have appropriate incident reporting and investigation procedures in a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) the requirements of AS5577 4.5.2 have been met, and b) the reporting requirements in IPART's Electricity Networks Reporting Manual have been met. 	
<p>3. Monitoring and recording processes have been adopted and implemented</p> <p>IPART considers that in order to have implemented all relevant records management arrangements in a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) the requirements of clause 4.5.3 of AS 5577 have been met, and b) all relevant internal and external stakeholders are identified, and procedures implemented for regular consultation and communication with, and reporting to, these stakeholders during the development, implementation and review of the ENSMS, in compliance with clause 4.4.6 of AS 5577. 	
<p>4. Appropriate procedures have been established for planning and implementing audits to determine compliance with, and the effectiveness of, the ENSMS's plans and procedures.</p> <p>IPART considers that in order to have implemented adequate auditing arrangements in a compliant ENSMS, the network operator must demonstrate that the requirements of clause 4.5.4 of AS 5577 have been met.</p>	

Note: Regulatory requirements are shown by reference to the source document (including the relevant clause number/s in the document), as follows:

The ESSNM Regulation refers to the *Electricity Supply (Safety and Network Management) Regulation 2014*

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a The minimum criteria are to provide guidance to an auditor on IPART's expectations of what would demonstrate that the requirements of the standard have been met. The auditor is to use their professional opinion, audit scope and Australian or International standards to determine what is appropriate evidence for the audit clause and where an electricity network operator may use an alternative to, or omit, the minimum criteria. The given criteria will apply unless amendments or additions are approved by IPART.

b The term "hazard" as used in AS 5577 is considered to be equivalent to the term "risk source" in AS/NZS 31000

Table A.4 Management review and change management

Minimum criteria ^a	Auditor's comments
<p>1. Adequate management reviews are undertaken</p> <p>IPART considers that in order to have appropriate levels of management review in a compliant ENSMS, the network operator must demonstrate that:</p> <ul style="list-style-type: none"> a) The requirements of clause 4.6.1 of AS 5577 have been met. b) The outcomes of audits have been reviewed by management in compliance with clause 4.5.4 of AS 5577. c) Appropriate thresholds for, and mechanisms to initiate management review are adopted. d) In the case of any significant change related to the design, operation or maintenance of the network (including significant incremental change), the operator has reviewed and where necessary, modified its ENSMS, in compliance with Clause 14(1) of the ESSNM Regulation. ('Significant change' is defined in Clause 14(1) of the ESSNM Regulation). e) Changes to the ENSMS have been developed in consultation with stakeholders and communicated to stakeholders, including IPART and other regulators, in compliance with clause 4.4.6 of AS 5577. f) Any review undertaken has taken into account the primary objective of an ENSMS, in compliance with Clause 14(2) of the ESSNM Regulation. 	
<p>2. Change management procedures are established to manage changes to the ENSMS and the network</p> <p>IPART considers that in order to have appropriate change management procedures, the network operator must demonstrate that the requirements of clause 4.6.2 of AS 5577 have been met.</p>	

Note: Regulatory requirements are shown by reference to the source document (including the relevant clause number/s in the document), as follows:

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AS 5577 refers to the Australian Standard AS 5577 – 2013 Electricity Network Safety Management Systems

ISO 31000 refers to the Australian/New Zealand Standard AS/NZS ISO 31000:2009 Risk management – Principles and guidelines

a The minimum criteria are to provide guidance to an auditor on IPART's expectations of what would demonstrate that the requirements of the standard have been met. The auditor is to use their professional opinion, audit scope and Australian or International standards to determine what is appropriate evidence for the audit clause and where an electricity network operator may use an alternative to, or omit, the minimum criteria. The given criteria will apply unless amendments or additions are approved by IPART.

b The term "hazard" as used in AS 5577 is considered to be equivalent to the term "risk source" in AS/NZS 31000