ELECTRICITY NETWORK SAFETY REGULATION: GREATER CONSISTENCY REMAINS ELUSIVE

Albert Koenig  BE MBA(Dist) FIEAust CPEng FAIE
Principle, KOENIG CONTRACT SERVICES
Adjunct Professor, University of WA
School of Electrical, Electronic & Computer Engineering

1 INTRODUCTION

This paper reviews an important recent development in technical and safety regulation of Australia’s electricity supply industry (ESI), the publication of AS 5577:2013 – Electricity network safety management systems.

As this paper explains, considerable improvement in the consistency of ESI safety regulation was expected to flow from the application of this standard in accordance with a special COAG Agreement, which requires new regulations to enforce application of the new AS 5577. However, as part of this some of the States/Territories and their regulators have continued a unilateral rather than harmonised approach to regulation-making, something that inevitably will create difficulties for network operators and their contractors, especially those working in more than one State/Territory.

The approach used by WA can best be described as abnormal, it is so inconsistent with the established principles for use of Safety Cases in regulatory regimes and the approaches used by the other States/Territories.

2 BACKGROUND ON REGULATORY ARRANGEMENTS FOR THE ESI

The electricity supply industry (ESI) sector, which includes transmission and distribution network operators (NOs), is subject to technical and safety regulation administered by State/Territory governments (also referred to as ‘jurisdictions’). Technical and safety regulation of industry activities aims to ensure the safety of people and property, but by 2008 the jurisdictions had not developed what can be called a consistent approach to such regulation for the ESI.

This lack of consistency caused concerns for the ESI and in 2008 the Energy Networks Association (ENA) representing the interests of electricity transmission and distribution businesses made its views known to the Ministerial Council on Energy (MCE), now known as the Standing Council on Resources & Energy.

There was some justification for these arguments, as not long before there had been some major electricity supply system outages on the east coast of Australia, and it had been found difficult to reinforce the emergency work crews of the affected utilities with line workers from others because of jurisdictional licensing as well as utility work practices differences. It was also the case that
regulators had differences between their regulatory regimes due to lack of coordination in their policy work, driven partly by inexperience with the ESI, by parochial thinking, and by lack of interest from Ministers.

Thus in June 2008, with the approval of the MCE, the Energy Technical and Safety Leaders Group was formed to develop harmonisation proposals and make recommendations.

At that time there were two national committees of energy related technical and safety regulators:

- the Electrical Regulatory Authorities Council (ERAC); and
- the Gas Technical Regulators Committee (GTRC)

and each had a representative on the Group\(^1\). The group also included representatives from the ENA (electricity and gas), the Australian Industry Pipeline Association, the CEPU and AWU unions, the training industry, plus an independent chair.

The 2008 meetings of this Group were lively, with the ENA revealing that it really wanted a single national energy technical and safety regulator and national legislation, and ERAC and GTRC responded that this was not on the agenda, whereas harmonisation of jurisdictional legislation was. The ENA was also insisting on the use of “safety cases” (or “safety management schemes”) to replace prescriptive legislation, citing the gas industry as an example of where this works well. ERAC and GTRC pointed out that the gas industry regulatory framework operates well without national legislation and a national regulator, because the safety case approach was based on a national technical standard.

Ultimately, after considerable policy negotiation, the Energy Technical and Safety Leaders Group reached compromise and recommended to the MCE that the Council of Australian Governments (COAG) establish an Inter-governmental Agreement (IGA) confirming the retention of all jurisdictional ESI regulators and their regulatory frameworks, but with the latter to be harmonised and based on the use of safety management schemes.

That is indeed what took place in January 2012 when an IGA was signed, a significant policy achievement.

In line with the objects of the IGA, Standards Australia formed Committee EN-004 Energy Network Management and Safety Systems, which prepared the required standard. It was released as **AS 5577 Electricity network safety management systems** in April 2013. Committee EN-004 had a composition similar to that of the Leaders Group.

### 3 AUSTRALIAN STANDARD AS 5577 – AN OVERVIEW

\(^1\) The author was the head of Energy Safety WA and ERAC’s representative during 2008

That the development of this national standard and its adoption by the jurisdictional regulators was the subject of a COAG IGA underlines the significance of electricity supply networks as part of the critical infrastructure and the importance of ensuring the safety of networks.

Why? Because these networks are capable of presenting serious local and large scale hazards to the community, if not managed correctly. The VIC Ash Wednesday bushfires of 1983, some of which stemmed from the interaction of vegetation and power lines, plus the disastrous VIC bushfires of late 2009, some of which were caused by the failure of electricity network assets, have enhanced the importance of this regulatory reform.

As the following extract from AS 5577 shows, the purpose of the Standard and its application are clearly defined:

This Standard provides nationally consistent requirements for the development of an Electricity Network Safety Management System (ENSMS) by an Electricity Network Operator (NO). An ENSMS is used to define how the NO manages the safe design, construction, operation, maintenance and decommissioning of its electricity network.

The electricity supply networks to which this Standard applies are electricity transmission and electricity distribution networks.

This Standard exists to provide an overarching framework for an ENSMS that recognises relevant industry network engineering, technical and safety standards, codes and guidelines. (author's emphasis)

The key principles on which the standard is based can be summarised as follows:

- The Standard exists for supporting the safety of people and property (the public, electrical and other workers, general property and network assets) both directly and indirectly.

- The Standard is intended to be compatible with obligations under the model "national" Work Health and Safety legislation.

- The NO is responsible for the safe design, construction, operation, maintenance and decommissioning of its electricity network and managing its safety risks, by identifying hazards associated with these activities, which are eliminated or if this is not possible, reduced to ‘as low as reasonably practicable’ (ALARP).

Note: AS 5577 requires a systems approach to safety management that is based on risk management principles (see Fig 1), but it needs to be noted that under the new Work Health and Safety legislation it is not considered acceptable to compare the risk of hazards to what may be seen as tolerable risk criteria or targets, and implement controls only if such criteria or targets are not satisfied. Rather, if a serious accident is possible, one must
consider taking whatever preventative action is available “… and only do less where it is reasonable to do so” (Francis G. & Robinson R. 2013).

- The NO will consult all relevant stakeholders as part of the preparation and implementation of the ENSMS.

4 SO WHAT DOES AS 5577 REQUIRE FROM THE NETWORK OPERATOR?

4.1 Commitment to the ENSMS

In addition to a general policy commitment to operating the network safely, the NO is required as part of the ENSMS to make a clear commitment to specific outcomes. This will be of importance to regulators, for enforcement purposes. For example, it could be a commitment to replace 10,000 ageing wood poles during each of the next 5 years.

4.2 Planning of the ENSMS

AS 5577-2013: Electricity Network Safety Management Systems sets out in considerable detail what is expected from the network operator preparing an ENSMS.

The core of the preparation work is production of Formal Safety Assessments that cover activities related to the following:

(i) Network planning.
(ii) Site safety management.
(iii) Network safety management incorporating –
   a) network structural integrity
   b) external interference management
   c) fault condition monitoring and response; and
   d) change of operating conditions and remaining asset life review.
(iv) Substation operations and maintenance.
(v) Emergency response

These assessments are required to be carried out in line with the well-established risk management principles of AS/NZS ISO 31000:

Stakeholder consultation can be expected to play a role in (d). For example, the treatment of the risk that a yacht mast may contact an overhead power line crossing a river may have been based on adequate clearance for say masts of yachts to 6 metres in length, whereas the local yachting community may argue that yachts up to 8 metres regularly sail in that section of the river.

The other key issue in the development of an ENSMS is that AS 5577 requires the NO to clearly identify in the ENSMS the technical and safety standards or industry / company codes that form the basis for the design, construction,
commissioning, operation, maintenance, operation and decommissioning of parts of the NO’s network.

4.3 Implementation of the ENSMS

The ENSMS is to contain details on how the NO will implement the ENSMS, and the Standard states this requires the following issues to be addressed:

- Resourcing for normal activities.
- Resourcing for dealing with unplanned operations and abnormal conditions.
- Unambiguous allocation of responsibilities for decision-making on policies and procedures; operational issues; identifying shortcomings of the ENSMS; dealing with shortcomings of the ENSMS; evaluation of corrective actions; and formal approvals as required.
4.4 Consultation on the ENSMS

The Standard requires NOs to consult with stakeholders that have an interest in the safety performance of the network, and suggests the list could include landowners, unions, employees, contractors, other utilities, local government, emergency authorities, regulatory authorities and government agencies.

Interestingly, the Standard does not state anything about the objectives of the consultations, other than that there is to be “……. regular consultation and communication with, and reporting to, these identified stakeholders during the development, implementation and review of the ENSMS”.

In summary, an ENSMS requires consultation but does not require the NO to necessarily take into account the outcome of consultations. This is an area where regulators would be expected to play a role.

4.5 Emergency preparedness in the ENSMS

The NO is required to include details in the ENSMS on how emergency events will be handled, whether these arise from operation and maintenance of the network, or as a result of external influences.

4.6 Measurement and evaluation

The Standard requires the NO to implement procedures for recording and analysing network performance data, to identify trends in the safe operation of the network and allow action to be taken as required. For example, accidents and incidents (injuries, death, significant damage, major outages) including near misses are to be recorded to allow investigation and reporting to management, and follow-up action, under the ENSMS.

As part of operating under an ENSMS, a NO is required to establish records management for:

- documents covering the ENSMS itself, including revisions;
- documents detailing the technical standards, codes and procedures related to all types of work on the network;
- maintenance of asset records (including maps, databases etc);
- maintenance of commissioning, operation, maintenance and audit records; and
- accident and incident records.

4.7 Management review and change management

The ENSMS is to include procedures for regular review by management of the success of the ENSMS, taking into account information gained through the actions described under “Management and evaluation”, including system audits. A review is required at least every 5 years.
5 WHAT IS THE FUTURE ROLE OF THE REGULATOR?

5.1 Existing regulator roles

The existing ESI technical and safety regulators of each jurisdiction are the following ERAC members (taken mostly from www.erac.gov.au):

- Electrical Safety Office QLD (ERAC chair)
- Electricity Standards & Safety TAS
- Energy Safe VIC
- EnergySafety WA
- Environment & Sustainable Development ACT.
- Office of the Technical Regulator SA
- IPART, NSW (since June 2015)
- Worksafe NT

The legislation for regulating the technical and safety aspects of the ESI varies considerably between each jurisdiction, hence the regulator roles also vary.

5.2 Changes as part of applying AS 5577

Under the IGA all jurisdictions are expected to amend their legislation to adopt the requirement for each NO to have an ENSMS in accordance with the provisions of AS 5577. Some have done so by September 2015 (the time of writing this paper).

The Foreword of AS 5577 notes that “In addition, some State and Territory jurisdictions may also require the submission of specific documentation to the relevant regulator, which demonstrates that the Network Operator has established an ENSMS that is compliant with this Standard”. There also is a note appended to Clause 1.4 – Legislative and Regulatory framework which reads:

“Acceptance of, and subsequent enforcement of, the technical standards, work practices and other obligations set out within a NO's ENSMS by the relevant regulator is to be prescribed by the legislation covering electricity supply industry technical and safety regulation in each jurisdiction”.

The author’s research on the approach used by regulators indicates that unfortunately there is considerable variation in adopting AS 5577 and enforcing ENSMS requirements. This is not the move to national consistency that was sought.

NSW is currently dealing with the privatisation (long term leasing) of its electricity transmission and distribution networks, so it has strengthened its regulatory arm by moving the ESI technical and safety regulation function from the NSW Department of Industry to IPART. The adoption of AS 5577 has been done through the Electricity Supply (Safety and Network Management) Regulation 2014 and these regulations require the network operator to have
and implement an ENSMS, which has to be initially and then regularly audited by an independent auditor (from a list approved by IPART). Auditor reports are required to be submitted to IPART, which may require implementation improvements and/or modifications to the ENSMS to ensure compliance with AS 5577 and network safety obligations. This is close to “acceptance on a no objection basis”.

The QLD regulator has not directly adopted AS5577, but has older legislation that requires NOs to prepare detailed safety management Systems and have them independently audited each year. The NOs have to provide the regulator with a copy of each SMS and audit reports. These requirements are similar to those in AS 5577, and the QLD NOs have been advised that if they use AS 5577 as the basis for their Systems, they will meet regulatory requirements, but why hasn’t QLD formally adopted AS 5577 and in that way provided greater clarity and certainty on requirements?

The NOs in SA and VIC are also privately owned or operate under long term leases. The SA Technical Regulator recently confirmed in that State the ENSMS are required to comply with AS 5577 and related regulatory requirements, and that regulator approval will be required for each ENSMS. Energy Safe VIC also requires compliance with AS 5577, but its Act refers to regulator “acceptance” (rather than “approval”) of each ENSMS.

So there is some variation between the major States, but WA is the leader in inconsistency of regulatory requirements. In March 2015 the EnergySafety WA website posted new draft network safety regulations for “consultation”, without any explanatory statement. There is evidence that major stakeholders (e.g. Local Government Association WA, LGAWA) were not consulted but the regulations were promulgated on 6/8/2015. They do not require a NO to submit its ENSMS to the regulator for approval, or for “acceptance” or even just for “information”. In other words, the regulator won’t have a copy of the ENSMS! This “hands off” approach is a major departure from existing WA regulatory requirements and is not in accord with what was envisaged under AS 5577 or the COAG IGA of 2012. So much for greater consistency of ESI regulation!

The WA approach is also a very questionable tactic, since statutory safety regulators normally exist to protect the community from the unsatisfactory performance of industry operators, through powers of approval, rejection and the enforcement of regulatory requirements, including prosecution. It will be interesting to see what develops once key stakeholders like the LGAWA become aware of the new regulations. Some LGAWA members represent communities that have suffered serious damage from fires caused by electricity asset failures, so having no EnergySafety WA oversight of a NO’s ENSMS is not likely to be seen positively.

5.3 Enforcement of commitments set out in an ENSMS

The challenge for regulators is to ensure electricity network safety management Systems to AS 5577 are drafted and applied in a meaningful way to cover the
daily work of the utilities, so that there is a genuine continuous improvement
cycle.

This will require System compliance audits from time to time, not just by the
internal auditors of the NOs or the independent auditors engaged on a cyclical
basis by the NOs, but also by the regulators.

For enforcement action such as an Improvement Order or for prosecution to be
possible, the relevant ENSMS needs to be written in a way that provides
commitment to specific methods, procedures and actions, not generalised
objectives or a “road map to company policy documents”. The manner in which
each ENSMS is drafted is therefore an issue for regulators.

None of the above will apply in WA, as the regulator will not have a copy of any
NO's ENSMS.

6 ONGOING MONITORING OF THE APPLICATION OF AS 5577

At this time of writing in September 2015 it is early days as some regulators
have only just commenced new regulatory regimes that formalise ENSMS
requirements.

Overall, the form of the regulation changes coming from the COAG Agreement
should have been discussed and agreed in principle by ERAC members prior
to implementation in each jurisdiction, but clearly that did not take place. Thus
considerable differences remain and in the case of WA, have been deliberately
introduced. So there remains much room for improvement.