

More regulation! But what price Safety??



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Safety in the electricity distribution industry has always been a high priority but with the overwhelming skills shortage in the industry and the shortfall in funding for maintenance and replacement of old assets, safety standards have slipped and accidents statistics are worrying. The Occupational Health and Safety Act of 1993 and the Regulations prescribe both the standards to be applied in order to ensure the safety of persons and equipment and the procedures that should be followed to monitor this.

The application of the Act is enforced and monitored by the Department of Manpower, the Chief Inspector, but often enforcement is reactive and based on investigations after accidents and incidents have occurred.

Would the appointment of a "Safety Regulator" assist the enforcement of the regulations and improve safety in the industry?

In the State of Victoria in Australia, Energy Safe Victoria (ESV) is established under the Energy Safe Victoria Act 2005 (Vic) and, amongst other things, is responsible for the implementation and enforcement of the regulations, standards, codes and policies of the Electrical Safety Act 1997 (Vic).

Among ESV's functions are the determining of minimum safety standards for electrical equipment, electrical installations and electrical work and to encourage and monitor the use of electricity safety management schemes.

One of the ways that ESV monitors the industry is by conducting safety audits and in 2001/02 PB was appointed by ESV (then the Office of the Chief Electrical Inspector) to conduct such an audit of the 5 privatised electrical distribution businesses and the transmission business in Victoria.

For reasons similar to those in SA the owners in the newly privatised industry were reluctant to spend money unless they were forced to and in addition manning levels were cut to the minimum in the interests of "efficiency".

This paper uses the results of the audit, as a case study, to illustrate the methodology applied and the results and findings of the audit.

Poor housekeeping, non compliance with regulations and procedures, poor accident investigations and reporting, ineffective safety management plans, no risk assessment processes, no internal audit systems, low clearance overhead lines and poor access control to high voltage installations. Not surprisingly many similarities can be found in this audit with safety audits of municipalities in South Africa and the paper describes these issues and demonstrates how the appointment of an Energy Safety Regulator in South Africa could effectively and efficiently improve the electrical safety performance of the ESI in SA.

I. General

Safety in the electricity distribution industry should be, by the nature of the industry, a high priority. A high level of technical skills are required for the workers in the industry and specific safety related training is essential to ensure that all workers are familiar with the dangers associated with their work and are trained in how to manage and mitigate these risks.

The management of electricity transmission and distribution assets is a complex operation, giving rise to a range of significant risks. The transmission and distribution systems have been constructed and developed over many decades and some current distribution assets are eighty years old or more. The expected life of many of the assets in question is extremely long and inevitably, assets with such lengthy lives require significant routine maintenance to be undertaken to ensure that they continue to function reliably and as intended. The overwhelming skills shortage in the industry and the shortfall in funding for maintenance and replacement of old assets will no doubt have an effect on safety standards and accidents statistics.

Little data is available in the public domain on incident statistics in the electricity supply industry in South Africa. In previous years NOSA were very active within both Eskom

and the municipalities and safety statistics were available to monitor safety performance.

The 50-year-old occupational-safety company was originally a nonprofit (Section 21) company, dependent on State funding but in the early 2000's State funding was withdrawn and the operations of NOSA as a Section 21 company were sold to a new entity – NOSA International – with the Section 21 company as its sole shareholder. Attempts at restructuring did not prove successful, and NOSA incurred significant losses in the ensuing period. As a result, further restructuring was undertaken however the situation eventually came to a head when, at the end of January 2005, NOSA was unable to pay its employees' monthly salaries. JSE Securities Exchange-listed company MicrOmega Holdings (MMG) stepped in, acquiring a 90% shareholding in NOSA for a nominal amount. Unfortunately all of the records maintained by NOSA were destroyed.

Today NOSA is a wholly owned subsidiary of MICROmega Holdings Limited, a company listed on the Johannesburg Stock Exchange, and is a leading global supplier of occupational risk management services and products.

Unfortunately no municipality currently obtains support in their safety management from what is perhaps the only professional safety advisor in South Africa.

The application of the Occupational Health and Safety Act of 1993 and related Regulations is enforced and monitored by

the Chief Inspector of the Department of Manpower, but often enforcement is reactive and based on investigations after accidents and incidents have occurred.

In this paper we discuss some of the issues observed in the municipal environment, recount our experience of a safety audit in Australia and explore an alternative approach that may be more cost effective towards improving safety performance.

II. South African Legislation

The Occupational Health and Safety Act of 1993 and the Regulations prescribe both the standards to be applied in order to ensure the safety of persons and equipment and the procedures that should be followed to monitor this.

The OHS Act is to: *“provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work...”*

Clearly, the Act provides for the safety of employees of the company as well as the general public. In the case of a distribution utility the exposure of the public to the operation of, and equipment owned by, the utility is considerable. Deterioration of safety standards and performance will therefore impact on both employee and public safety.

In Victoria, Australia the Electricity Safety (Network Asset) Regulations were revoked in December 2009 and it is now mandatory for the distributors to have an all-embracing Electricity Safety Management Scheme (ESMS) in place.

This represents a major shift from largely prescriptive legislation to safety management schemes.

The ESMS requirement constitutes an example of "process-based" regulation. That is, it is based on mandating a risk management process, constituting risk identification, risk assessments and the implementation of risk controls, as well as record-keeping, auditing and updating requirements. The regulations are essential to give full effects to the amending legislation.

The underlying rationale for moving to a regime of compulsory ESMS requirements is that the nature of the risk profile in this area is such that it is likely to be more efficient and effective to rely more heavily on process-based regulation and, as a corollary, reduce the current extent of prescriptive regulatory requirements in this area.

The reasons for a change to an ESMS are further explored in Section V. .

III. Some South African Examples of safety issues

PB has been involved in several asset valuation exercises and technical audits in South Africa and other Southern African countries. The condition of the assets will affect the life of the assets, and hence the value on a depreciated replacement cost basis. To a large extent the “condition” is a function of the quality of the operations and maintenance experienced by the asset and the following are some of the general points considered when assessing the “condition” of a utilities assets for valuation purposes: -

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- The general condition of the substation equipment and the associated overhead circuits;
- The standard of maintenance that has been carried out;
- The level of skill of the maintenance staff;
- The degree to which procedures are being followed;
- The quality of the procedures, and
- The performance of the network, which will provide an indication of the quality of the maintenance.

Our Condition Assessment Checklist uses the above criteria in a question and answer style spreadsheet in order to quantify the likely condition of the assets.

Some of our observations in the industry include the following: -

- Many utilities are operating without the appointment of the appointees required by the General Machinery Regulations. In some cases the highest skill level in the electricity department is supervisor or technician. According to recent presentations by EDI Holdings on average 50% of critical technical staff positions are vacant across 36 municipalities in South Africa. The consequence of this is that OHS Act “issues” are often not dealt with properly due to the lack of experience and knowledge of the requirements of the Act.
- Switching linking and earthing operations are not undertaken in accordance with any written procedures. No records are maintained of operating procedures or operations and Permits to Work are not issued on assets isolated for work. More importantly training in high voltage operating was not being undertaken.
- No complete and up to date single line diagrams available of the networks. This invariably results in incorrect operations leading to unplanned outages and accidents.
- Access to outdoor high voltage substations was in some cases completely unrestricted. This not only allowed access by unauthorised persons including children but also made the theft of copper earthing conductors very easy.
- 11kV networks were out of phase with adjacent interconnected networks. This was of particular concern in that no single line diagrams were available or used during switching operations.
- Ground clearance of newly constructed high voltage lines were below statutory requirements. In some cases there was under clearance by 2 metres.
- No routine maintenance was undertaken on the high and medium voltage equipment. Due to the shortage of staff equipment was only attended to when faults occurred.
- No regular maintenance of circuit breakers and protection equipment, including batteries and AC/DC power supplies, resulting in extensive blackouts due to the mal-operation of protection devices.

- Few, if any, spare parts for any equipment resulting in “temporary” unsafe repairs. In one instance a ring main unit had failed and temporary “repairs” were made by exposing and tying together the 11kV cable ends and covering the “joint” with a plastic bag. This on a busy street with pedestrians passing by.

According to recent presentations by EDI Holdings on average 50% of critical technical staff positions are vacant across 36 municipalities in South Africa. In addition and on average these municipalities were only spending 60% of their budgeted capital expenditure.

The above focuses on issues relating to general safety of operators and the general public and are specific to municipal distributors. For the same reasons that these issues are not being addressed it can be assumed that many other aspects of compliance are also not being followed.

IV. Some Victoria, Australia Examples of safety issues Background of the ESI in Victoria

The development of the electricity supply industry in Australia was not dissimilar to the development of the industry in South Africa.

In the Australian state of Victoria, when electricity generation first became practical, the main uses was lighting of public buildings, street lighting, and later [electric trams](#). As a result electricity generation and distribution tended to be carried out by municipalities, by private companies under franchise to the councils, or by joint private-public bodies. Electricity was generated and distributed by a number of private and municipal generator and distribution companies. The main municipal-owned power station in Victoria was operated by the Melbourne City Council, who generated electricity from its Spencer Street Power Station for the city’s residents, as well as being a wholesale supplier to other municipal distributors. The main privately owned company was the Melbourne Electric Supply Company which was established in the 1880s and operated under franchise arrangements with a number of other municipal distributors.

Legislation passed in December 1920 resulted in the formation of the State Electricity Commission of Victoria (SECV) from the Electricity Commission.

The SECV took over a number of small municipal electricity distributors during the 1920s, and in the 1930s the Melbourne Electric Supply Company was acquired along with their street tramway operations. Despite these acquisitions, municipal controlled distribution companies known as Municipal Electricity Undertakings (MEUs) in the inner urban areas of Melbourne remained outside of SECV control until the privatisation of the industry in the 1990s.

In 1994, the Kennett government disaggregated the SECV into five distribution and retail companies (absorbing the MEUs in the process), five generation companies, and a transmission company. Along with other state-owned utilities (such as the Gas and Fuel Corporation of Victoria), these businesses were all corporatised, then privatised between 1995 and 1999.

Today the Victorian Electricity Supply Industry (VESI) comprises five distribution networks namely CitiPower, Powercor, SP AusNet, Jemena and United Energy, with the transmission network owned and operated by SP AusNet (the Network Operators). The VESI takes its energy supply from the various generation sources in Victoria and through the interstate connectors.

There is total separation between the retail and wires businesses and the Essential Services Commission of Victoria (ESC) is responsible for the regulation of retail businesses and the Australian Energy Regulator (AER) is responsible for regulating distribution, transmission and the wholesale electricity market.

Today Energy Safe Victoria is Victoria’s statutory independent electricity, gas and pipeline safety and technical regulator who regulate the safety and technical compliance of energy supply, installations, appliances and pipelines, and raise industry and community awareness of electricity, gas and pipeline safety.

A Memorandum of Understanding sets out the arrangements to promote effective communication, cooperation and co-ordination between EnergySafe Victoria and the Australian Energy Regulator.

Case Study, the Safety Audit

Under the Electricity Safety Act 1998, the Office of the Chief Electrical Inspector (the Office, now Energy Safe Victoria) had a responsibility to ensure the electrical safety of electrical generation, transmission and distribution systems, electrical installations and electrical equipment and to control the electrical safety standards of electrical work carried out by electrical workers in Victoria.

In 2002 the Office commissioned PB to conduct a safety audit of the Victorian electricity distribution and transmission Network Operators against the regulatory framework.

The purpose of the safety audit was to assess the transmission company and each of the distribution companies in Victoria for the following:

- Compliance with Sections 75 and 149 of the Electricity Safety Act 1998;
- Management of the exemption process to meet the requirements of Part 1 of the Electricity Safety (Network Assets) Regulations 1999; and
- Accuracy and validity in reporting and recording of electrical incidents to meet the requirements of Part 2 of the Electricity Safety (Network Assets) Regulations 1999;
- Existence of satisfactory plans to meet the requirements of Part 3 of the Electricity Safety (Network Assets) Regulations 1999;
- Mechanisms within the Network Operator’s business to effectively protect persons from risk and property from damage, associated with network assets, to meet the requirements of Part 4 of the Electricity Safety (Network Assets) Regulations 1999.

The objectives of the audit were:

- To improve the level of electrical safety of the Victorian transmission and distribution networks.

- To ensure that Network Operators have appropriate policies, procedures, processes and compliance systems in place (including appropriate forward planning initiatives) to achieve the required compliance with the regulations.
- To determine whether legislation and regulations are effective to achieve the safety outcomes.
- To verify the level of Network Operators' knowledge and acceptance of their safety responsibilities.
- To increase public understanding of and confidence in the safety of the electrical transmission and distribution systems, the regulatory framework and the safety management practices of the distribution and transmission Network Operators.
- To provide a sound basis for the development of electrical safety compliance programs in conjunction with the Network Operators.

The audits focussed on key areas of the Network Operators practices that were considered to have an impact on electrical safety as required by the relevant clauses of the Electricity Safety (Network Assets) Regulations 1999 and other appropriate legislation. General areas of concern identified in the audit were as follows: -

- The audit confirmed that in most areas the Network Operators were complying with the requirements of the Act and Regulations. All of the Network Operators appeared to have comprehensive structures and supporting policies in place, however the manner in which compliance matters are separated and brought to Board attention needed some improvement.
- Certain areas of non-compliance were common across the (Distribution) Network operators. Some Network Operators had specific areas on non-compliance that were identified in the audit.
- In order to ensure a uniform approach across the business all of the distribution companies had either developed or were developing a formal risk management framework in relation to safety and the management of network assets. One Network Operator had no formal risk assessment framework in place at the strategic level in relation to safety and the management of network assets.
- In order to ensure that procedures and processes were adequately applied the audit included a review of quality systems. All of the distribution companies had quality management systems in place of some form or other although some were better than others. Certain Network Operators quality management systems did not cover all of the documents used in their asset management programmes.
- All of the distribution companies had introduced both internal and external auditing of work practices. In most cases the extent to which auditing was undertaken was considerable and appeared to achieve good results. In the case of two Network

Operators some improvement in auditing processes was indicated.

- All Network Operators maintained incident registers for the notification and reporting of incidents in accordance with the requirements of the Regulations. In the case of three Network Operators it appeared that a tighter control would be appropriate in order to ensure strict compliance with the Regulations.
- All of the distribution companies had a number of the 'old type' overhead service lines in place within their network and many of these were past their serviceable life and prone to failure. The companies had different strategies to manage this, which were mostly reactive and include replacement on failure or replacement on detection.
- All Network Operators had procedures for identifying, prioritising and addressing low conductor clearances during the routine inspections of the lines, however the audit clearly identified the fact that all of the distribution Network Operators had service lines that did not comply with the requirements of the regulations with respect to clearances above ground
- The audit included a review of field type activities in an attempt to assess the extent to which the Network Operators' policies, procedures and work practices were being followed by field staff and contractors. Without exception, at least one "issue" was identified with each Network Operator during site visits; this would indicate that all the Network Operators are using some work practices that do not comply with the Regulations, or in some cases with their own internal procedures and that in certain cases an improvement in the internal auditing of work practices was indicated.
- With some exceptions, housekeeping at substations was found to be not in accordance with good industry practice.
- There was no requirement in the Green Book (the HV operating rules for the VESI) to "phase out" after breaking HV bridges and general practice is to rely on the operator remembering the connection sequence. It was recommended that this and other operational issues were addressed by the Green Book Committee.
- The condition and storage of portable earthing devices in some of the Network operators was not in accordance with good practice. In addition the current rating of portable earths in use in the substations of all of the Network Operators, where the fault levels have increased in recent years, was considered to be questionable.

There is no doubt that the audit was extremely useful in identifying issues of concern within the VESI. When one considers that the audit was conducted over a two month period by some 6 engineers from PB the results for both the Office and the industry in general the approach can be

considered to be very cost effective. The VESI supplied some 3.5m domestic, commercial and industrial customers in 2002. The impact of privatisation had been to produce a “lean and mean” workforce and skills shortages were apparent in many areas. The benefits of the audit were seen as the following: -

- Increased acceptance by Network Operators of their electrical safety responsibilities.
- Reduced number of deaths and serious incidents of electrical nature.
- Provide confidence that there are appropriate asset management plans to achieve compliance with electricity safety regulations.
- Provide confidence in existing legislative approach and/or a revised approach.
- Reduced number of electrical safety issues raised by the public which require active involvement by the OCEI.
- Implementation of programs to ensure compliance with the legislation.

V. The legislative Situation in Victoria, Australia Pre 2010

The opportunity for the 5 Victorian electricity distributors to implement Electricity Safety Management Schemes (ESMS) has existed since 1999 with the passing of the Electricity Safety (Management) Regulations 1999. It then took some years for the distributors to implement safety management schemes, which have only been partial schemes. The main regulatory instrument for the distributors was the Electricity Safety (Network Asset) Regulations (together with the associated Electricity Safety (Network Assets) Code) which represented a prescriptive approach to regulation. The distributors' Electricity Safety Management Schemes applied only to limited areas covered by the Network Asset Regulations and Code.

The ESMS allowed for variation to the Regulations, which may provide a more flexible method of operation. The objective was for Network Operators to maintain the same or a greater level of electrical safety with the ESMS as that achieved under the Regulations.

The ESMS was completely voluntary and was a form of self-regulation. An economic evaluation was needed to be carried out by the Network Operator to assess the benefit of such a scheme. An ESMS had to demonstrate appropriate proven procedures and policies to achieve the required level of safety.

The current position

The Electricity Safety (Network Asset) Regulations were revoked in December 2009 and it is now mandatory for the distributors to have an all-embracing ESMS in place (the transmitters have a grace period to do this). This represents a major shift from largely prescriptive legislation to safety management schemes.

These legislative amendments came into place on 1 January 2010 and it is therefore far too early yet to tell statistically what effect these changes have had (if any).

The ESMS requirement constitutes an example of "process-based" regulation. That is, it is based on mandating a risk management process, constituting risk identification, risk

assessments and the implementation of risk controls, as well as record-keeping, auditing and updating requirements. The regulations are essential to give full effects to the legislation. The regulations set out in detail the required content of an ESMS.

The underlying rationale for moving to a regime of compulsory ESMS requirements for certain electrical operators is that the nature of the risk profile in this area is such that it is likely to be more efficient and effective to rely more heavily on process-based regulation and, as a corollary, reduce the current extent of prescriptive regulatory requirements in this area.

Cost implications

The expected cost impact of the regulations was estimated by surveying all seven of the Major Electricity Companies (MEC) that are required to comply with the ESMS requirement. These survey responses indicated that the seven MECs are expected to incur costs associated with ESMS development, implementation, monitoring and review totalling \$16.8 million in present value terms over the expected 10 year life of the regulations. In addition, regulatory administration and enforcement costs of \$0.6 million were expected to be incurred by ESV over the same period.

However, it should be noted that these constitute the gross costs associated with the regulations. Five of the seven affected MEC were currently operating under voluntary ESMS arrangements that had been in place under the auspices of the Electricity Safety Act 1998 for several years. This group would inevitably have continued to incur ESMS related costs even in the absence of the recent legislative change in the legislation and the proposed regulations. In addition to these direct compliance costs, it can be anticipated that substantive costs will be incurred as a result of the implementation of the risk controls determined to be appropriate through the risk identification and assessment process. The Essential Services Commission (ESC) has estimated these costs at approximately \$140.8 million during the current five-year pricing period. This is equivalent to approximately \$291.6 million over the expected 10 year life of the proposed regulations. The implementation of the regulations is expected to increase the substantive costs to a significant degree. This reflects both the fact that two MEC will be subject to ESMS requirements for the first time and the fact that ESV expects to require more detailed and wider ranging ESMS to be prepared under the new mandatory arrangements than have been adopted in practice under the current voluntary scheme. While no precise quantification of the likely size of the substantive cost increases is possible, and indicative estimate is that the current level of substantive costs could increase by a factor of up to 100% following the implementation of the mandatory ESMS arrangements. Again, however, is necessary to emphasise that these constitute the gross costs associated with the proposed regulations. That is, the affected parties already bear a significant proportion of these costs.

The adoption of the new regulations must be compared to a base case. With the sunseting of the Electricity Safety (Network Assets) Regulations, the base case could be defined as the situation that would exist in the absence of these regulations as well as the Electricity Safety (Management) Regulations. However, the alternative approach is to consider the base case as one in which the prescriptive requirements of the current Electricity Safety (Network Assets) Regulations 1999 would continue, rather than being allowed to lapse at the time of their sunseting in late 2009. This latter approach is considered to better reflect the reality of the current policy context, in that the network assets regulations would be unlikely to be allowed to lapse in the absence of the new regulations.

The estimates prepared by the ESC suggest that the substantive costs to the electricity transmission and distribution sector of moving toward full compliance with the Electricity Safety (Network Assets) Regulations could be as great as \$1.7 billion and would, almost certainly, substantially exceed the total costs incurred in complying with the proposed regulations. This means that the costs of the new regulations could be interpreted as a saving of up to \$1.2 billion on the cost of achieving full compliance with the current Electricity Safety (Network Assets) Regulations.

Practical implications

Inadequate electrical safety performance among transmission and distribution companies can result in three major types of harm. These are: -

- Death and injury due to electrocution;
- Economic loss due to reliability problems, and
- Efficiency/cost of maintenance practices & impact on consumer prices.

The mandatory ESMS arrangements are expected to address all of these dimensions of the problem.

Substantial parts of the electricity transmission and distribution network do not comply with various elements of the Electricity Safety (Network Assets) Regulations 1999.

This non-compliance reflects the fact that the existing stock of network assets has been installed over a period of decades and that safety standards have evolved over this period.

The safety risks associated with instances of non-compliance with the regulated standards by network assets vary significantly according both to the type of non-compliance and the location of the non-compliant asset (and related circumstances). Given this, the approach of ESV to compliance issues has been to attempt to take a risk-based approach to requiring electricity network operators to improve the compliance of existing assets with the regulations over time. The new mandatory ESMS is the logical extension of this approach.

In recent years, electricity distribution businesses have argued strongly that the substantial non-compliance of their network assets with the regulatory requirements requires them to undertake a significant program of additional capital expenditures to move toward full, or “literal” compliance with the Electricity Safety (Network Assets) Regulations, and that these expenditures should be reflected in the decisions of

the economic regulators responsible for price setting in the industry.

To illustrate this aspect the electricity regulator summarised these two scenarios (in US\$M) in the 2004 Price Review Position Paper as follows: -

	AGL E	CP	PC	TXU	UE	Ttl
Risk Management Approach	23.1	20	80.6	57.3	45.2	226.2
Literal Compliance	270.0	143.0	742	480.0	74.0	1708.0

While the OECE (now ESV) rejected these claims the fact remained that there was considerable non compliance in many areas and that compliance for compliance sake was wasteful. A risk based approach such as that laid out in the new ESMS regulations would be more cost effective. Some distributors also noted in their submissions to ESC that there was significant legal doubt as to the ability of (the then) OECE to grant exemptions from aspects of the network asset regulations pursuant to its approval of a voluntary ESMS and argued that this was a further factor underpinning the need for distribution companies to increase capital expenditures to move toward “literal compliance”.

In the event, the ESC did not accept the above arguments put forward by the distribution businesses and did not, as a consequence, build additional capital expenditure, as would be required to move toward literal compliance with the network asset regulations, into the pricing model. Instead, it argued that: -

*“All distributors proposed capex for electrical safety compliance under the regulations, including the implementation of their electricity safety management plans. Although there is doubt in some or all distributors’ minds over whether they ought to rely on their plans as opposed to budgeting to undertake sufficient work to bring all the network into compliance (referred to elsewhere as the literal compliance option), it appears that all distributors consider that, from a technical and safety standpoint, the safety management plan approach is a pragmatic solution to the issues that have been identified. **We considered that our assessment ought to be based on the implementation of these plans, not on literal compliance costs, and we have followed that approach”***

The Essential Services Commission had not allocated sufficient funding to enable the network operators to comply with the current regulations. Instead the price review relies on each of the network operators having an ESMS that analyses and addresses the risks at hand.

The ESMS in summary

Electricity safety management schemes must formally identify both the person responsible for the relevant electricity supply network or installation and the person responsible for the electricity safety management scheme itself. It must describe the electrical work or electrical installation to which it relates in sufficient detail as to allow ESV to identify its location,

extent and scope and assess the risks that are associated with it.

The regulations also require that a formal safety assessment be undertaken and specify the required content of that safety assessment. The scheme should also identify all elements of the regulations made under the authority of the Electricity Safety Act 1998 and from which the scheme operator seeks exemption.

The Regulations provide for the requirements, procedures and other matters relating to the acceptance of electricity safety management schemes.

VI. Conclusions

There is ample evidence that the skills shortage, backlog in maintenance and replacement of aged assets and the low levels of capital and operations expenditure in the municipal electricity environment in South Africa is affecting the safety and technical performance of the industry.

Statistics are not available to prove this claim; however, all involved in the industry will confirm a decline in technical performance in most utilities. Ringfencing exercises by EDI Holdings confirm that the shortage of skills is affecting performance and spending is below par.

NOSA Disabling Injury Frequency Rates for all industrial categories show the following: -

Year	DIFR
2007	0.82
2008	0.63
2009	0.68

Although not statistically significant these figures do indicate that NOSA intervention, which includes the implementation of safety management schemes, is producing results.

It is too early to see the results of the implementation of a mandatory ESMS in Victoria, Australia but certainly the logic applied in taking this route as opposed to the requirement for the strict compliance to the regulations make good common sense.

Parallels between the municipal electricity distribution industry in South Africa and the Victoria ESI in terms of ageing assets and the requirements for considerable expenditure in the management of these assets into the future are clear. The justification for a similar intervention would therefore be the same.

To summarise, the mandatory ESMS proposal has been developed primarily as a safety related initiative which seeks to address the problem that network asset operators are not using best practice, management based approaches to ensuring that dangers to workers and the public arising from network assets are minimized. Thus, while it is acknowledged that the level of fatalities and injuries associated with network assets is currently low, it is expected that the introduction of mandatory ESMS will further lower the incidence of fatalities and injuries.

However, while the primary driver of the mandatory ESMS proposal is a safety based one, the proposal is also expected to address two other significant problems associated with the operation of network assets. First, it is expected that the adoption of a mandatory ESMS will address the problem of

the extremely high compliance costs that would otherwise potentially be incurred by network asset owners in order to bring all aspects of their asset base into full compliance with the prescriptive. Secondly, it is expected to make a relatively small but nonetheless important contribution to improving the reliability of supply of electricity and therefore reducing the current substantial costs experienced by consumers as a result of unplanned electricity supply outages.

What is further required is the appointment of an Energy Safety Regulator to regulate the process.

VI ACKNOWLEDGEMENT

Our thanks and acknowledgment to Parsons Brinckerhoff for their permission to present this Paper.

VIII BIOGRAPHIES

With a transmission and distribution utility background **Ron Millard** has extensive experience in the management of power utilities including technical, financial and human resource management. Ron has also been responsible for the project management of distribution, transmission and power generation projects in several countries.

Since joining PB Power Ron has project managed transmission and distribution projects and has been actively involved in providing strategic advice and support to the utility industry. This includes asset management, capital forecasting and regulatory advice to electricity utilities and regulators. He has been team leader on several due diligence exercises for distribution and transmission business acquisitions and prior to returning to South Africa in 2002 was Operations Manager based in the Melbourne office of PB Power.

Leon Fourie has 30 years of experience in the electrical distribution industry ranging from design, project management and managing electrical utilities with a specific focus on the municipal electricity industry.

His project management experience includes a variety of electrical engineering projects inclusive of township reticulation, sub – transmission overhead lines, power factor correction installations inclusive harmonic filtering, substation upgrading and expansion projects., fibre optic differential protection systems, large factory medium voltage distribution systems, street lighting. Since 2004 he has been actively involved with the restructuring of the EDI in South Africa and has been involved in numerous ring fencing and asset valuation projects. He was instrumental in the refining of the DRC valuation handbook for EDI Holdings in RSA. He has been involved in Due Diligence and Transaction Advisory work for industry restructuring and privatisation in several African countries and is currently the Manager of the Networks Division of PB.