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**Good Practice**

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# Electrical Power Transmission and Distribution:

## Health, Safety and Security

In association with:



Private Infrastructure  
Development Group  
Pioneering infrastructure changing lives



**Gridworks**  
Powered by CDC Group

**actis**

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## Acknowledgements

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### CDC

CDC is the world's first impact investor, with over 70 years' experience of successfully supporting the sustainable, long-term growth of businesses in Africa and South Asia. CDC is a UK champion of the United Nation's Sustainable Development Goals – the global blueprint to achieve a better and more sustainable future for us all. CDC has investments in more than 1,200 businesses in emerging economies with total net assets of £5.8 billion and a portfolio of £4.3 billion. This year, CDC will invest more than \$1.5 billion in companies in Africa and Asia with a focus on fighting climate change, empowering women and creating new jobs and opportunities for millions of people.

CDC is funded by the UK government, and has a dual objective to support business growth that lifts people out of poverty, and to make a financial return. All proceeds from its investments are reinvested to improve the lives of millions of people in Africa and South Asia.

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### Gridworks

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## Abbreviations and acronyms

<b>ABC</b>	Aerial Bundled Conductor	<b>IFC</b>	International Finance Corporation
<b>AIDS</b>	Acquired immunodeficiency syndrome	<b>ILO</b>	International Labour Organisation
<b>AOP</b>	Annual Operating Plan	<b>ISSA</b>	International Social Security Association
<b>BMJ</b>	British Medical Journal	<b>KPI</b>	Key Performance Indicators
<b>CAIDI</b>	Customer Average Interruption Duration Index	<b>LRP</b>	Livelihood Restoration Plan
<b>CAIFI</b>	Customer Average Interruption Frequency Index	<b>LOTO</b>	Lock Out Tag Out
<b>CAPEX</b>	Capital Expenditure	<b>LV</b>	Low Voltage
<b>CHSS</b>	Community Health, Safety and Security	<b>OHS</b>	Occupational Health and Safety
<b>DGUV</b>	German Social Accident Insurance	<b>OHSS</b>	Occupational Health Safety and Security
<b>EHS</b>	Environmental Health and Safety	<b>OPEX</b>	Operational Expenditure
<b>ENA</b>	Energy Networks Association	<b>PCB</b>	Polychlorinated Biphenyl
<b>ESG</b>	Environmental, Social and Governance	<b>PIDG</b>	Private Infrastructure Development Group
<b>ESMS</b>	Environmental and Social Management System	<b>PPE</b>	Personal Protective Equipment
<b>ETEM</b>	Electrical and Media Products Sectors	<b>PS</b>	Performance Standard
<b>EUR</b>	Euros	<b>PSEAH</b>	Preventing Sexual Exploitation, Abuse and Harassment
<b>FPIC</b>	Free, Prior and Informed Consent	<b>PTW</b>	Permit to Work
<b>GBVH</b>	Gender-based Violence and Harassment	<b>QA</b>	Quality Assurance
<b>GDP</b>	Gross Domestic Product	<b>ROP</b>	Return on Prevention
<b>HIV</b>	Human Immunodeficiency Viruses	<b>RAP</b>	Resettlement Action Plan
<b>HSES</b>	Health, Safety, Environmental and Social	<b>SAIDI</b>	System Average Interruption Duration Index
<b>HSSE</b>	Health, Safety, Social and Environmental	<b>SHE</b>	Safety, Health and Environment
<b>HSG</b>	Health and Safety Guideline	<b>UN</b>	United Nations
<b>HV</b>	High Voltage	<b>UNGP</b>	United Nations Guiding Principles on Business and Human Rights



# 01

## Introduction

Access to electricity is closely correlated to economic development and a range of social opportunities and benefits. As a result, the electrical power transmission and distribution (T&D) industry is highly impactful. There is growing recognition of the significant opportunity that T&D companies and investors in the sector can play in the delivery of assets that are developed and managed to deliver more reliable, clean power to businesses and households in the markets in which they operate. In doing so, they can help to alleviate poverty and contribute to the United Nation's Sustainable Development Goals (SDG), including SDG7: affordable and clean energy.

However, in emerging markets, investments in the T&D sector can present complex and difficult challenges including elevated Occupational Health & Safety (OHS) and Community Health, Safety & Security (CHSS) risks. The partners in this good practice note (CDC, PIDG, Gridworks and Actis) all recognise there is a very important role to play in promoting and delivering T&D networks that are safe for workers and communities. While there are common issues, there is no simple solution to these challenges, since each investment is unique as asset conditions and availability of human and technical resources can vary significantly. Some assets may have also been subject to historic under-investment, which further increases risks to the workforce and the public.

This good practice note – which is based on the first-hand experiences of the partners and other T&D investors and companies – aims to support companies and investors to improve OHS and CHSS processes. It provides practical guidance and good practice examples with the aim of achieving good international industry practice over time. It focuses on issues that are particular to the T&D sector (including specifically governance and oversight processes that have proved helpful in enhancing OHS and CHSS measures) but does not aim to cover all aspects of construction safety, operational safety (such as road safety) or broader corporate governance aspects that many investors will also see as central to the changes they wish to enable during their holding period.

The good practice note is aimed at engineers, OHS and environmental and social (E&S) specialists within investor institutions, and T&D companies involved in the design, construction and operation of the full range of T&D assets – from large national utilities through to smaller private networks and mini-grids.

The partners involved in creating this guidance note are committed to producing a breakthrough in safety performance in their investments by applying rigorous standards, building a strong safety culture, and developing competent and experienced safety leaders. Two examples of how our investees have worked to improve OHS and CHSS outcomes and the wider benefits of investments in the T&D sector are presented below.

## Investment example 1: Virunga Energy, the Democratic Republic of the Congo

### The challenge

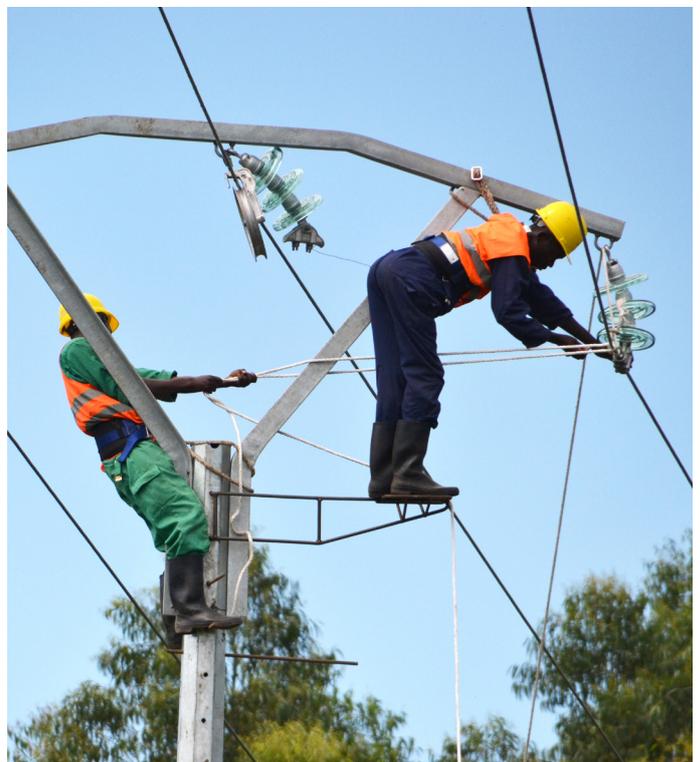
Virunga Energy is a hydro-electric power business in the eastern area of the Democratic Republic of Congo. Following decades of conflict and political instability, this is one of the most challenging environments to do business. CDC backed Virunga Energy in 2016 to help bring clean energy to communities living in and around the Virunga National Park. The aim was that reliable electricity supply from Virunga Energy will boost business activity to provide sustainable livelihoods. However, at the time of the investment, there was a lack of capacity to implement a robust health and safety management system, and drive forward a change in health and safety culture.

### The action

CDC supported Virunga Energy to develop and grow its own Congolese Health, Safety, Social and Environmental (HSSE) team, to create local employment and build a sustainable management function for the long term. CDC supported the training of local staff to better identify and manage key health and safety, environmental and social risks, based on the needs and priority areas of the business. This included a broad range of topics, such as how changes to working practices can improve workplace health and safety, and the importance of community engagement in building a social licence to operate. Community engagement included important content related to sensitising local people on the dangers of electricity – an important aspect, as for many communities this was the first time that electricity distribution assets had been located in close proximity to their homes.

### The outcome

Virunga Energy now employs a dedicated HSSE team and has developed an environmental, health, safety and social (EHSS) management system which has had a positive impact. Engagement with the local community has considerably improved. Individuals in the team have benefited directly from Virunga Energy's capacity-building programme by developing new skill-sets which allow them to better analyse and manage the environmental and social aspects of their projects. CDC hopes that implementing international environmental and social standards will drive positive OHS and CHSS outcomes, as well as making the company more attractive to other investors in the future, which in turn will help to bring much-needed additional stability to the business and local economy.



### The challenge

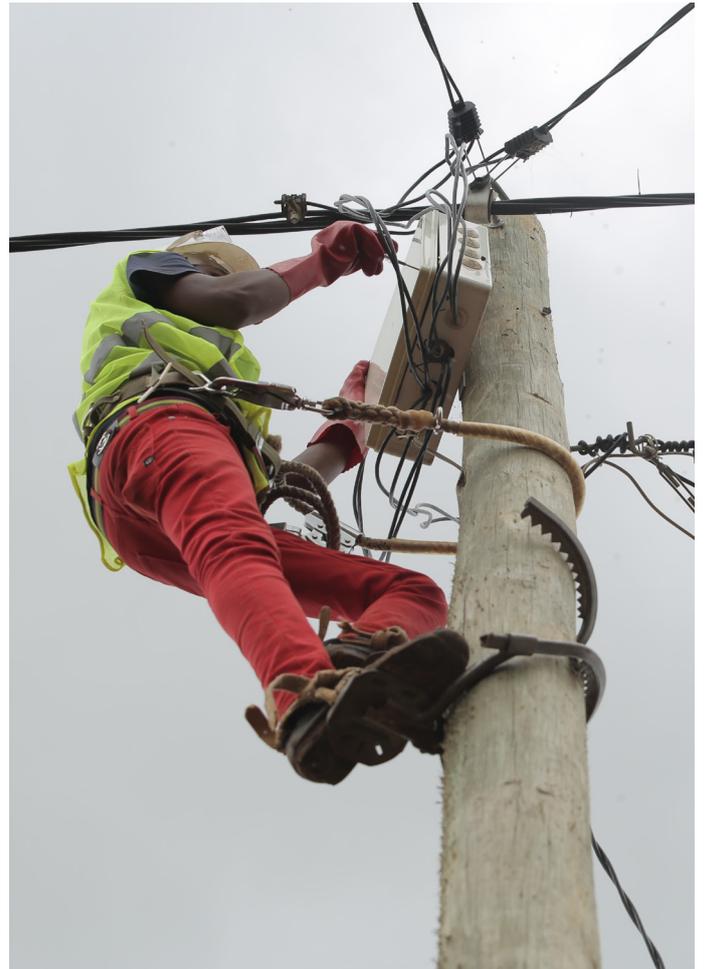
Residents in the villages of Shitunguru and Isenzanya, two off-grid communities in the Mbeya region of Tanzania, have had many difficulties accessing clean energy. REDAVIA Solar Power is a market leader of cost-effective rental solar power for businesses and communities. With the support of PIDG company InfraCo Africa, REDAVIA scaled up its innovative business model across Tanzania, providing first-time clean energy to the communities of Shitunguru and Isenzanya, and commencing operations of an eight-container solar farm at Shanta Gold's New Luika mine in the Chunya district. At the time of the investment, lack of access to power was a key constraint to business growth in remote and rural areas of Tanzania, and many young people were moving to urban areas to find employment.

### The action

Alongside safe and clean electricity, REDAVIA provides new opportunities for the local community. InfraCo Africa sought to build security and electrical engineering capacity within the REDAVIA team. Musa Haonga had been unemployed for six months before becoming a security guard for REDAVIA in 2015. Patrolling the solar farm to prevent thefts and to keep community members safe around the installation inspired Musa to learn more about how the mini-grid system works. By watching and learning from the company's experienced electricians, Musa developed a keen interest which, combined with training provided by the company, helped him acquire the skills he needed to be promoted to Assistant Technician for Shitunguru in 2018. Musa now supports the Head Technician in maintaining the Shitunguru solar farm and works with a team of specialist home wiring technicians to connect new customers.

### The outcome

People in Shitunguru are now connected to a solar mini-grid, enabling 24/7 access to safe and reliable power. With the arrival of reliable solar power, Musa has also noticed a shift in the mindset of young people in the villages. Before, they often moved away to the city for work, which was a significant problem for villages like Shitunguru. Now, some of Musa's friends are returning from urban areas, a change which he believes reflects the new opportunities REDAVIA power has brought to the villages. The health and safety training and equipment provided to Musa and his colleagues by experienced electricians – as well as remote and in-person monitoring of systems and safety standards by REDAVIA – ensures the mini-grids operate safely at all times, and can continue delivering power to rural communities.



## 1.1 Managing electrical infrastructure risks

Without appropriate mitigation measures, the construction and operation of electrical infrastructure is a high-risk activity. It involves working with live electrical equipment, circuit isolation, working at heights, lifting and hoisting of equipment, as well as the transportation of major plant items, such as power transformers. Operators can also face health risks through management and use of hazardous materials, including manmade chemicals such as polychlorinated biphenyls (PCBs), sulfur hexafluoride (SF6), chromated copper arsenate (CCA), and other wood treatments and pesticides for vegetation management, which may also create environmental risks.

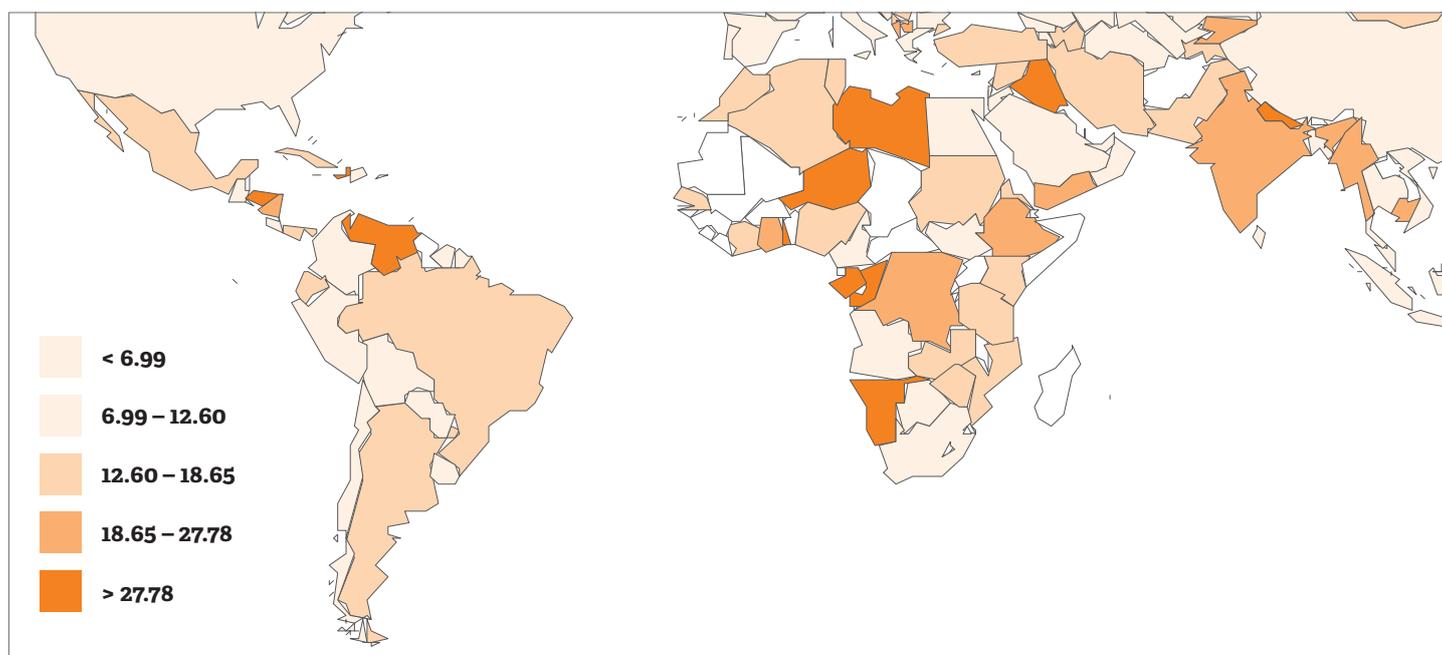
External factors – including climate change and severe weather events which are expected to increase in severity and frequency over time – can increase the risk of physical infrastructure damage. This can include causing overhead lines and poles to fail and increasing the risk to members of the public coming into contact with live conductors, resulting in serious injury and fatalities. OHS risks also increase when working in poor weather.

The T&D sector can also present elevated risks in terms of systemic fraud and corruption challenges, and consequential OHS and CHSS impacts. Risks can relate to a number of company operations such as procurement, inventory management and sales, where collusion and corruption can often result in the installation of sub-standard or defective equipment and poor quality of workmanship. Such activities increase the risk of injury to workers, operators and the public. While outside the scope of this good practice note, the potential fraud/H&S linkages should be explored through close working with business integrity specialists.

The assets also present a risk to the public as a consequence of illegal tampering with the power network in the form of theft of electricity. Figure 1 is a map that highlights the scope of the challenge that investors and investee organisations face in operating T&D networks, and managing the safety risk associated with illegal activity to members of the public (in this case represented by the level of losses).<sup>1</sup> The map shows that reported losses in many emerging markets are more than 18 per cent of total energy output. The higher losses in these areas are due to both technical issues and significant illegal activity, with participants putting themselves at risk of serious injury or death when tampering with live equipment.

This good practice note recognises that a company or investor has varying degrees of control to mitigate and manage risks over different risk and risk factors. The management of risks associated with employee and contractor/subcontractor OHS and CHSS as it relates to asset integrity is fully within the control of a company, but mitigating the risk of illegal activity on the network is more difficult. However, every company has a responsibility and moral duty to do everything in its power to help manage all potential risks associated with its assets. Therefore, this good practice note places a significant emphasis on the understanding and mitigation of CHSS risks.

**Figure 1:** Electrical power transmission and distribution losses by country (% of output)



▲ **Source:** World Bank Data, all rights reserved. This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

1 World Bank Data: Electric power transmission and distribution losses (% of output).

## 1.2 Accident analysis and causes

Incident and accident analysis has led to the development of the widely-accepted framework that the root causes of incidents are a combination of process, plant and equipment, and people-related factors (see Figure 2). The three factors interact in various ways, influencing health and safety in the workplace. Therefore, to prevent incidents and accidents, these root causes must often be tackled together.

### Process

First, organisational commitment and senior leadership – evidenced by robust processes being put in place – form the basis of good health and safety management, and encompass several factors including clear definition of responsibilities, coordination, communication and provision of adequate resources.

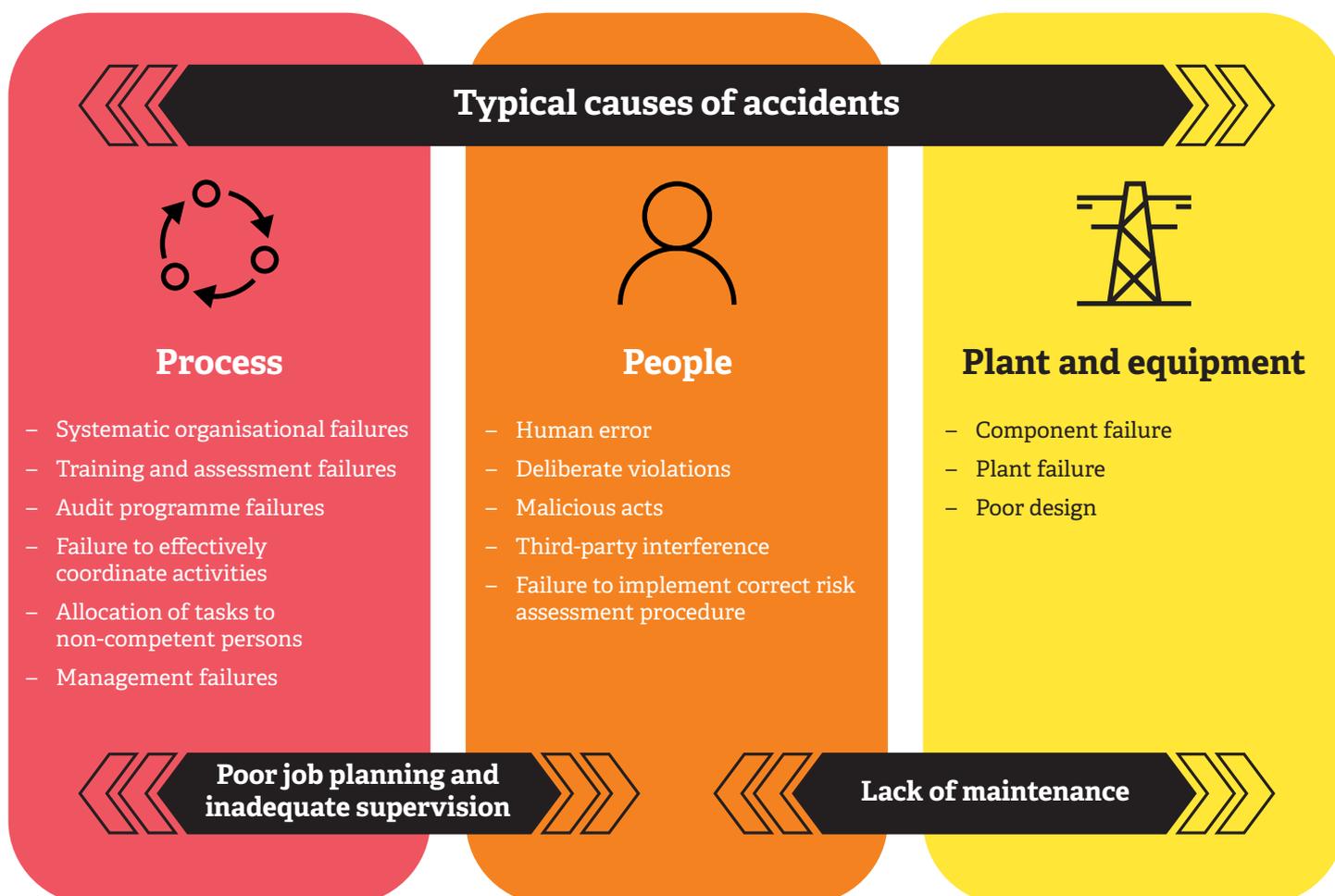
### Plant and equipment

The second pillar in the management of OHS and CHSS risks relates to the working environment, particularly around plant and equipment design and maintenance. Managing the risk factors associated with the working environment requires robust mechanisms to identify potential risks and to determine equipment design and maintenance requirements to minimise those risks.

### People

Third, people factors are a combination of risk perception, skills, competence and personality. When discussing human failure, a differentiation is made between errors and violations. It is important to note that while violations are a deliberate failure to follow a particular rule or behaviour, in most cases the underlying reason relates to a lack of understanding of the risks involved. Understanding the linkages between process, plant and equipment, and people-related factors is critical, and interventions need to be effective across all elements to effectively manage OHS and CHSS risks.

Figure 2: Typical causes of accidents



### 1.3 About this good practice note

The advice is provided in a structured matrix form of 'objectives' and 'activities'. It focuses on recommended activities and sub-actions to be carried out to achieve the defined objectives at different stages of the investment life-cycle, to minimise or eliminate potential OHS and CHSS risks.

The defined objectives and activities relate to the respective roles of investors, boards of directors and management teams (including contractors) within a T&D company. As investors do not operate networks, the advice for investors naturally differs to the advice for the management teams.

**The matrix design in the following section is structured into three separate matrices:**

**The matrices navigation pane** provides a single-page high-level summary of all objectives and corresponding activities across the investment life-cycle. It is provided for use by investors, boards of directors and the management teams within T&D companies, to identify recommended interventions relating to achieving specific OHS and CHSS related objectives.

**The Level 1 and Level 2 matrices** provide a much more detailed description of specific tasks and actions that are recommended for achieving each of the stated objectives summarised within the matrices navigation pane. The Level 1 matrix focuses on objectives and related activities relevant to investors and boards of directors, while the Level 2 matrix is more relevant to senior managers, operational managers (including contractors) and team leaders within T&D companies.

This good practice note includes several case studies of incidents within the T&D sector across different geographies, and these are used to highlight particular lessons learned.

For investors, this good practice note sets out a process for assessing and mitigating principal risks which are identified through all phases of an investment cycle – from due diligence through to operation and maintenance. This information is intended to inform investment and prioritisation decisions about how quickly improvements could be made to reduce the likelihood of fatalities and injuries associated with T&D networks.

Consequently, we direct readers' attention to the need for boards of directors (through the executive management) to develop a long-term health and safety strategy and culture with targets to deliver improvements. To support this long-term strategy, an Annual Operating Plan (AOP) for OHS and CHSS should be developed by the executive management team and approved by the board. The AOP should align with the priority risks within the Company Corporate Risk Register, identify the performance indicators used to effectively assess its delivery, and the organisation needed for delivery of annual targets. The AOP recognises that to reduce risk, plans may require bespoke risk mitigation measures identified in the early investment stages.

For the CHSS objectives and activities, the focus is to protect the local communities potentially at risk from the T&D assets. The activities proposed within the matrix are structured to protect an individual's human rights, reflecting foremost the right to life.<sup>2</sup> This is a broad topic, and all relevant aspects of human rights are integrated in the guidelines around issues such as land acquisition, workforce, community and stakeholder engagement, and grievance redress. Constructive stakeholder engagement is essential, recognising the importance of including all relevant government bodies.

Although this good practice note provides advice across a relatively broad range of activities, we recognise that certain aspects will require further specialist technical or health and safety advice and support, particularly where complex issues are identified.

In using this good practice note, it is important to carefully consider the timeframe over which OHS and CHSS improvements can be made. This is an important factor for investors to consider when acquiring older and poorly maintained networks.

<sup>2</sup> When using the term 'human rights', please see the UN document: [Guiding Principles on Business and Human Rights](#).



## 02

### Intervention matrices

#### 2.1 Introducing the matrix structure

This section provides practical advice to investors and investee organisations to allow effective and proactive management of OHS and CHSS performance within the T&D sector within emerging markets. The advice is provided in a structured format and identifies activities and related actions that are grouped to address a set of defined objectives.

The objectives, activities and related actions are presented in a matrix format across a typical investment life-cycle, illustrated below, with the matrix scope covering the initial investor due diligence activity through all pre-construction and construction stages, including asset operation and maintenance.

#### Investor due diligence / investor decision

#### Pre-construction

#### Construction and commissioning

#### Operation and maintenance

This is not a linear process. Following due diligence, investments can be made at any stage through the life-cycle, and the approach to understanding and managing OHS and CHSS risks to achieve stated objectives will differ accordingly. Investments relate to both greenfield and brownfield sites, and the matrix can be applied to both scenarios.

#### Navigating the matrices

**The matrices navigation pane** includes a high-level summary of objectives and a set of related activities across this investment life-cycle, to assist the user in focusing on the life-cycle activity most relevant to their business. The Matrices navigation pane also shows a numerical indication after each activity, identifying which are detailed further within the Level 1 matrix (board responsibilities) and which are detailed in Level 2 matrix (management team responsibilities).

➤ **Good corporate governance is an important element at every stage. Put simply, 'governance' is the system by which organisations are directed and controlled.**

Following the matrices navigation pane, the note sets out a summary of the key elements of governance for which boards of directors are responsible in relation to T&D issues. In addition, guidance is also provided to support the investor when carrying out checks to determine if the board of director and senior management roles and responsibilities are clearly defined and understood.

**The Level 1 matrix** provides more detailed guidance on the specific objectives, activities and related actions for investors and boards of directors.

**The Level 2 matrix** includes detailed guidance, commentary and relevant reference documents that are intended for more senior managers and team leaders within T&D development and operating companies.

The stated objective and activities are supported by appendices, case studies and external reference documents. For specific activities detailed within the Level 1 and 2 matrices, the relevant reference documents are indexed to the summary table containing the full list of reference documents.

Within both matrix sections of this good practice note, a selection of case study accidents and incidents from the T&D sector are presented. Sadly, each of these incidents resulted in a fatality or a significant injury to a member of the public, member of staff or contractor working for a power utility organisation.

These case studies are from different geographical regions, have different root causes and offer a broad range of lessons to be learned. These learning points are a major consideration when developing appropriate interventions.

A detailed set of appendices – including questionnaires, checklists and assessment tables – has been included that investors should find useful when undertaking any necessary due diligence of an organisation's OHS and CHSS management. A brief explanation of each is provided below:

- **Appendix 1** features a set of core actions for investors to carry out a structured assessment of OHS and CHSS leadership within a target investee organisation.
- **Appendix 2** provides guidance on good practice in relation to OHS and CHSS leadership. Current practice can then be assessed relative to good practice, to identify any gaps and corrective actions.
- **Appendix 3** includes a questionnaire (or checklist) to assist in carrying out an assessment of a company's approach to health and safety leadership.
- **Appendix 4** focuses on the technical and operational controls required to ensure safe operation of the power network. This may form part of a technical due diligence to identify where there may be significant omissions or lack of controls within an organisation's operation of the T&D network.
- **Appendix 5** provides a checklist of essential components required to ensure the safe management of contracts.
- **Appendix 6** provides a checklist of key mitigation measures that should be assessed for network assets identified in a very poor ('critical') condition.

Within Appendices 4-6, a structured assessment scoring criterion is included. This can be applied to each of the key components, enabling these to be prioritised and corrective actions identified and included within any improvement plans.

- **Appendix 7** provides terms of reference and standard agenda for an Health, Safety, Environmental and Social (HSES) committee reporting to a board of directors.
- **Appendix 8** provides additional guidance relating to the management of risks relating to overhead electricity poles.

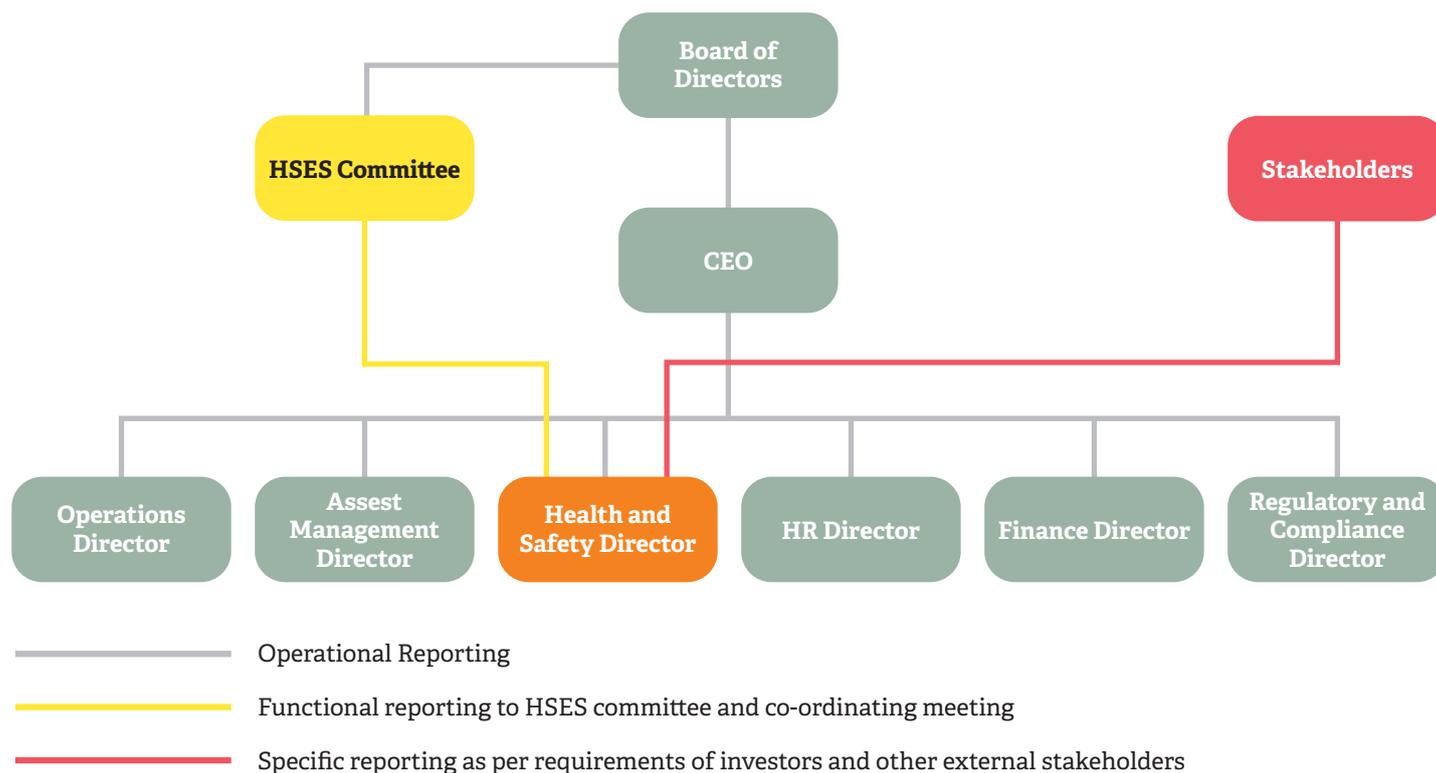
## 2.2 Matrices navigation pane

Note: a number is provided after each activity, identifying which activity is detailed further within the Level 1 matrix (board responsibilities) and which are in the Level 2 matrix (management team responsibilities), depicted with a [1] or [2] respectively.

INVESTOR DUE DILIGENCE/DECISION		PRE-CONSTRUCTION		CONSTRUCTION AND COMMISSIONING		OPERATION AND MAINTENANCE	
<b>Objective</b>	<b>Carry out effective due diligence of corporate governance and risk management arrangements</b>	<b>Objective</b>	<b>Plan to mitigate risks</b>	<b>Objective</b>	<b>Define and establish key roles and responsibilities</b>	<b>Objective</b>	<b>Operate and maintain networks to prevent danger</b>
	Conduct a high-level assessment of the investee company's strategy, plans and policy and arrangements. <a href="#">[1]</a>		Conduct detailed and effective planning at the project design stage to design out OHS and CHSS risks. <a href="#">[2]</a>		Appoint competent persons to key roles, and hold them accountable for the safe delivery of the project. <a href="#">[2]</a>		Establish an operational health and safety management system and plan to control and mitigate operational risks. <a href="#">[1&amp;2]</a>
	Check whether corporate governance and risk management arrangements are in place and fit for purpose. <a href="#">[1]</a>		Assess the capabilities and experience of national/local contractors for effective OHS and CHSS risk management – supported by capacity building. <a href="#">[2]</a>		Ensure the selection and appointment of a competent contractor with the necessary OHS and CHSS management competencies, policies, plans and control measures. <a href="#">[2]</a>		Ensure the management system includes regular asset inspection, maintenance and record-keeping policies and procedures. <a href="#">[1&amp;2]</a>
	Check whether the management of OHS and CHSS are integrated into the main governance structure of ESG, including board sub-committees, such as risk, remuneration and finance, ESG and audit. <a href="#">[1]</a>		Plan and manage the procurement of products and services so that risks are minimised. <a href="#">[2]</a>		Assess the competence, training and certification of the workforce, including sub-contractors, and develop a plan to close any gaps. <a href="#">[2]</a>		Establish asset risk management and HSES committees that report to the board. <a href="#">[1&amp;2]</a>
<b>Objective</b>	<b>Ensure effective management systems are in place to manage OHS and CHSS performance</b>	<b>Objective</b>	<b>Design out risk</b>	<b>Objective</b>	<b>Establish a safe and secure worksite</b>		Establish OHS and CHSS training programmes for all operational staff. <a href="#">[2]</a>
	Assess the company's commitment, capacity and track record including current and past OHS and CHSS performance and improvements made to date. <a href="#">[1]</a>		Design, review and sign-off safety aspects relative to design criteria and both national and international standards. <a href="#">[2]</a>		Identify hazards associated with the worksite, and carry out OHS and CHSS risk assessments to mitigate such hazards. <a href="#">[2]</a>		
	Check whether the board has a strategy for ESG risk management, a plan to deliver the strategy, and that formal reviews are undertaken. <a href="#">[1]</a>		Review the application of relevant OHS and CHSS standards and ensure they are integrated in the initial design phase. <a href="#">[1&amp;2]</a>		Ensure safe access and egress routes to and from work locations. <a href="#">[2]</a>		
	Check whether the board considers OHS and CHSS when deciding senior management appointments. <a href="#">[1]</a>		Assess technical aspects of the design so that installed equipment is fit for purpose. <a href="#">[2]</a>		Ensure all work is properly supervised and carried out by competent people, in accordance with site-specific and task-specific risk management plans. <a href="#">[2]</a>		
	Check whether an appropriate management structure is in place to ensure effective two-way communications. <a href="#">[1&amp;2]</a>		Ensure site selection process avoids or minimises OHS and CHSS risks. <a href="#">[2]</a>		Ensure robust change management procedures are established and followed (including design, location, and pre-commissioning checks). <a href="#">[2]</a>		
	Check that the management of OHS and CHSS is adequately resourced. <a href="#">[1&amp;2]</a>	<b>Objective</b>	<b>Procure safety</b>	<b>Objective</b>	<b>Monitor and review performance (including contractors and sub-contractors)</b>		
	Check whether effective monitoring and reporting systems are in place – including the reporting of OHS/CHSS leading/lagging KPIs to the board. <a href="#">[1&amp;2]</a>		Include health and safety design principles within procurement policies and procedures. <a href="#">[1&amp;2]</a>		Continually review OHS and CHSS performance, including non-compliance and accident and incident reporting and investigation. <a href="#">[1&amp;2]</a>		
<b>Objective</b>	<b>Identify poor network performance leading to OHS and CHSS risks not being effectively controlled – resulting in poor performance</b>		Ensure procurement processes include product or service life-cycle assessment to meet OHS and CHSS objectives. <a href="#">[2]</a>		Develop a plan to close-out accident and incident learning points. <a href="#">[1&amp;2]</a>		
	Conduct a detailed third-party assessment of system performance and asset condition. <a href="#">[1]</a>				Develop procedures to rectify non-compliance issues in a consistent manner, including a code of conduct for workers with clearly-defined sanctions for breach of code. <a href="#">[1&amp;2]</a>		
	Check whether capital and revenue expenditure programmes are targeted and effective in the mitigation of business risk. <a href="#">[1&amp;2]</a>	<b>Objective</b>	<b>Protect the community</b>		<b>Objective</b>	<b>Protect the community</b>	
	Get the opinion of stakeholders (e.g., communities and government organisations) on the company management of ESG risks, including OHS and CHSS. <a href="#">[1]</a>		Plan land acquisition to avoid or minimise involuntary resettlement and economic displacement. <a href="#">[2]</a>		Ensure the local community is protected from risks associated with employment of a non-local or migrant project workforce. <a href="#">[2]</a>		
<b>Objective</b>	<b>Check legal and regulatory compliance</b>		Develop a project-specific stakeholder and community engagement plan addressing vulnerable groups and including a community grievance mechanism. <a href="#">[2]</a>		Ensure the worksite is kept secure from inadvertent or deliberate third-party access. <a href="#">[2]</a>		
	Assess the regulatory environment and check whether there are any outstanding or past prosecutions for offences or civil cases. <a href="#">[1]</a>		Conduct risk assessment of CHSS risks during the asset life-cycle. <a href="#">[2]</a>		Ensure security personnel operate in line with the UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials when dealing with trespass incidents. <a href="#">[2]</a>		
	Get the opinion of the regulator on company performance against regulatory standards. <a href="#">[1]</a>		Develop a security management plan aligned to the UN Guiding Principles on Business and Human Rights, where security is required. <a href="#">[2]</a>		Ensure living conditions at worker camps are established in line with relevant standards, and a worker's code of conduct on interacting with the communities (including appropriate safeguarding requirements with clear sanctions for breach of code) is implemented. <a href="#">[2]</a>		
					Minimise the risk of potential community conflict by engaging a local workforce from surrounding villages in accordance with a transparent recruitment plan that also defines minimum age and supports capacity building. <a href="#">[2]</a>		
					<b>Objective</b>	<b>Protect children</b>	
					Develop a recruitment process – in consultation with local communities – with defined minimum age requirements for employment. <a href="#">[2]</a>		
					Develop and implement community awareness programmes on electrical safety. <a href="#">[2]</a>		
						<b>Objective</b>	<b>Secure the assets and protect the public</b>
							Ensure that, where practicable, members of the public are prevented from gaining access to network assets. <a href="#">[2]</a>
							Prepare and implement an operations-specific stakeholder and community engagement and consultation plan. <a href="#">[2]</a>
							Operation and maintenance practices require specific initiatives to deter, identify and resolve illegal practices and the significant CHSS and OHS consequences. <a href="#">[2]</a>
						<b>Objective</b>	<b>Manage the operational and public safety risks associated with danger from overhead lines</b>
							Introduce a comprehensive inspection and remediation process, as well as training and awareness for operational staff and communities, including through schools. <a href="#">[2]</a>
							Where there are high levels of public risk due to the condition of old equipment, develop a safety mitigation strategy to reduce risk while best practices are being developed. <a href="#">[2]</a>

## 2.3 OHS and CHSS management roles and responsibilities

Figure 3: Typical board of directors organigram



### Company health and safety business interfaces

The investor needs to check that executive and senior management roles and responsibilities are clearly defined and understood. The tables below provide guidance on the specific responsibilities of the board of directors and the management team for all major OHS and CHSS related subjects.

#### Board of directors: key responsibilities

Provide clear vision and leadership in developing a positive culture in OHS and CHSS

Appoint Chief Executive

Establish HSES committee and monitor performance

Approve AOP and monitor performance

Approve performance award scheme and monitor performance



*“Companies’ corporate governance arrangements must be effective with adequate levels of board and executive management team oversight. This will enable companies to meet their regulatory obligations in terms of ensuring the health and safety of all persons affected by their undertaking.”*

### Independent fact-finding investigation into transmission line worker fatality

Subject	Management team: key responsibilities
<b>Policy</b>	Input on strategic direction, development of policies and their implementation.
<b>Compliance audit and inspection</b>	Establish technical audit process. Establish site audit and inspection process. Ensure and monitor implementation.
<b>Statutory and business reporting</b>	Develop process and procedure to ensure statutory, regulatory and business reporting is carried out in accordance with national health and safety, environmental, and company regulations. Ensure implementation of policy and procedures.
<b>Incident response</b>	Policy development, implementation and management of process. Initial response and implementation of recommendations.
<b>Incident classification and case management</b>	Develop policy and procedures to ensure accurate classification of accidents and incidents, including establishing the case management file. Ensure case management file actions are prioritised and monitored.
<b>Liaison with regulatory bodies</b>	Establish OHS / CHSS lead contact. Senior management involvement to be provided as and when required.
<b>Technical training</b>	Set training standards and establish a mechanism for development and delivery of training.
<b>Performance improvement planning and delivery</b>	Establish AOP and deliver, monitor and refresh the plan as required.
<b>Performance award scheme</b>	Establish performance targets focused on supporting delivery of the AOP. Establish scheme policy and operational management of the scheme.
<b>Procurement</b>	Design and implement procurement policies and procedures to comply with relevant obligations.

## 2.4 OHS and CHSS governance and compliance

### What is governance and why is it different from management?

Governance is the system by which organisations are directed and controlled. It is distinct from management, which can be thought of as the regular day-to-day actions required to run the business.

Governance refers to the higher-level processes by which managers are held to account, and through which broader strategic decisions are taken. Experience shows, the key method of achieving good governance is through the establishment of a HSES committee, with a focus on OHS and CHSS, reporting to the company's board of directors. Template Terms of Reference for a HSES committee are included within Appendix 7.



*"Companies have a duty under their regulatory obligations to have in place safe systems of work designed to ensure the health and safety of their employees, contractor's employees, and members of the public. In the case studies throughout this document, some of these systems were not in place; others were either ineffective or significant levels of deliberate noncompliance were evident"*

### **Independent fact-finding investigation into linesman major injury**

## Summary of the key governance elements for which directors are responsible:

### Key elements

- Leading the business and establishing its overall strategic direction.
- Setting values and standards for the business and clear objectives for management – and delineating the limits of their responsibility.
- Holding management to account for their performance in running the business.
- Upholding obligations to shareholders and other stakeholders.
- Overseeing internal controls.

### How are these delivered?

#### Key principles for best practice governance

- Set clear values and standards: Be clear about the terms of the corporate responsibility contract (with all stakeholders), and set explicit standards and values for the business.
- Think strategically about corporate responsibility: Understand the problems and design a business model that avoids them.
- Be constructive about regulation: Support both self-regulation and government intervention to enable performance improvements.
- Align performance management: Reward responsible success over the long term, and not just meeting narrow financial targets over the short term.
- Create a culture of integrity: Set the tone at the top, and entrench the right values in the corporate culture.
- Use internal controls to secure responsibility: Safeguard the company's standards with robust internal audit and control systems.

### Best practice drivers depend on the following:

#### Moral responsibility

- The Chief Executive and directors have a moral responsibility to keep their workforce safe and healthy.
- A general duty of care for employees and others affected by business activities.
- A desire to comply with the law.

#### Legal responsibility

- Duty to comply with the law.
- Potential prosecution and the imposition of punitive penalties.
- A good compliance record can be critical to the licence to operate.
- The consequences of a major incident.

#### Financial responsibility

- Companies have an obligation to identify, control and mitigate business risks that can incur direct and indirect costs to the business.
- They must also ensure sufficient financial resources are allocated to effectively control the risks.

#### Typical costs are

- Poor corporate image/loss of reputation.
- Insurance claims/higher insurance costs.
- Damage to equipment.
- Accident and incident investigation time.
- Lost productivity.
- Legal costs.
- Downtime and rework time following an accident.
- Employee compensation and medical treatment costs.
- Cumulative business loss.

A set of guiding principles has been developed to support investors and investees in establishing an appropriate and effective OHS and CHSS governance framework:

#### Guiding principles for the establishment of health and safety governance, compliance and management structures:

- Reflect best practice in corporate health and safety governance.
- Clearly align strategy and policy.
- Build and improve relationships with key external stakeholders.
- Regularly review existing and emerging legislation.
- Set policy to ensure 100% regulatory compliance.
- Audit compliance with policy and legislation.
- Ensure transparent and robust investigation of all incidents.
- Ensure rigorous, robust implementation of policy and incident investigation recommendations.
- Ensure consistent and transparent classification of accidents.
- Facilitate continuous improvement in performance.

## 2.5 Level 1 matrix

This matrix is for investors and boards of directors.

INVESTOR DUE DILIGENCE/DECISION	
Activity	Actions
<b>Objective: Carry out effective due diligence of corporate governance and risk management arrangements</b>	
<p>Conduct a high-level assessment of the investee company's strategy, plans and policy arrangements. <b>(Further guidance and supporting information is included in reference documents 1, 2, 3, 7, 8, 9 and 43)</b></p>	<ul style="list-style-type: none"> <li>– Check whether the board of directors for the investee company has a strategy and track record for managing and improving OHS and CHSS issues and performance.</li> <li>– Consider the timeline over which improvements can be made with the anticipated level of funding and consider the residual risks – and whether these are acceptable.</li> <li>– Check whether the strategy encompasses all appropriate legal and regulatory obligations.</li> <li>– Ensure the strategy, plans and policy arrangements are effectively communicated throughout the organisation.</li> <li>– Use assessment checklists and guidance on governance and management to assess the effectiveness of the company corporate governance arrangements and management systems.</li> </ul>
<p>Check whether corporate governance and risk management arrangements are in place and fit for purpose <b>[See Case study 1]</b> <b>(See reference documents 1, 2, 3 and 10)</b></p>	<ul style="list-style-type: none"> <li>– Check whether a corporate risk register exists.</li> <li>– Confirm that all business risks have been identified and ranked in order of severity.</li> <li>– Confirm that management of risks is allocated to directors.</li> </ul>
<p>Check whether the management of OHS and CHSS is integrated into the main governance structure of ESG, including board sub-committees, such as risk, remuneration and finance, HSES and audit. <b>(See reference document 10)</b></p>	<ul style="list-style-type: none"> <li>– Check whether key OHS and CHSS roles and responsibilities are clearly defined and allocated.</li> <li>– Confirm whether board sub-committees are established and are actively identifying and managing risk.</li> <li>– Confirm whether arrangements are in place for incentivising a safety culture through management remuneration and bonus.</li> <li>– Check that competent advice is sought and acted upon by the board of directors.</li> </ul>

### Case study 1: Corporate risk management systems

#### » Type of injury sustained:

Two fatal accidents.

#### » Brief summary of incident:

Two near identical fatal accidents occurred on a 400kV transmission line construction project. The line was being constructed through mountainous terrain and the risks involved were not properly assessed or controlled. Both accidents involved heavy plant traversing inadequately designed and poorly constructed tower location access roads. This resulted in the machine operators losing control of their machines. In one incident the machine left the access road completely and in the other incident the machine overturned crushing the operator and catching fire.

#### » Key lessons learned:

- The corporate governance arrangements necessary to ensure the safe management of major construction contracts were not fit for purpose.
- The tender award process was flawed, as bidders could fail the health and safety assessment and still proceed to technical and financial evaluation stages.
- The principal contractor selected had a very poor in-country safety record and failed the health and safety assessment – but was still awarded the contract.
- Controls on the appointment of competent sub-contractors did not exist.

**The company's risk management systems were not fit for purpose.**

**Board and executive management oversight of risk management systems, the process of escalation of major risks, and the prioritisation of those risks – in terms of actual and potential severity – was flawed.**

## INVESTOR DUE DILIGENCE/DECISION

Activity	Actions
<b>Objective: Ensure effective systems are in place for managing OHS and CHSS performance</b>	
<p>Assess the company's commitment, capacity and track record, including current and past OHS and CHSS performance, and improvements made to date. <b>[See Case study 2]</b></p> <p><b>(See reference documents 7 and 56)</b></p>	<ul style="list-style-type: none"> <li>- Check that effective planning, organisation, control, monitoring, and the review of preventative and protective measures, are in place.</li> <li>- Check whether the risks to employees, customers and members of the public are understood, assessed, documented and communicated.</li> <li>- Check whether the board of director's legal and regulatory obligations are documented and understood.</li> <li>- Confirm that the board has written OHS and CHSS policies.</li> <li>- Confirm that the board has access to internal and external competent advice.</li> </ul>
<p>Check whether the board of directors has a strategy for ESG risk management, a plan to deliver the strategy, and that formal reviews are undertaken.</p> <p><b>(See reference documents 7 and 56)</b></p>	<ul style="list-style-type: none"> <li>- Check whether the board has an understanding and ownership of key OHS and CHSS risks.</li> <li>- Check whether OHS and CHSS appear regularly on board meeting agendas.</li> <li>- Confirm that the delivery of the ESG strategy is allocated to individual board members.</li> </ul>
<p>Check whether the board considers OHS and CHSS when deciding senior management appointments.</p> <p><b>(See reference documents 26 and 56)</b></p>	<ul style="list-style-type: none"> <li>- Check whether OHS and CHSS management standards exist, and that they are in accordance with international best practice standards.</li> <li>- Check whether senior management roles and responsibilities are clearly defined.</li> </ul>
<p>Check whether an appropriate management structure is in place to ensure effective two-way communications.</p> <p><b>(See reference document 7)</b></p>	<ul style="list-style-type: none"> <li>- Confirm that a tailored stakeholder engagement strategy is in place for all phases of a project life-cycle.</li> <li>- Ensure communications are effectively targeted and delivered.</li> <li>- Check whether messages communicated are understood by the recipients.</li> <li>- Confirm that recipient feedback, when received, is acted upon, and that outcomes are communicated.</li> </ul>
<p>Check that the management of OHS and CHSS is adequately resourced.</p> <p><b>(See reference document 7)</b></p>	<ul style="list-style-type: none"> <li>- Ensure that sufficient, competent resources are available to deliver plans, policy and procedures.</li> </ul>
<p>Check whether effective monitoring and OHS and CHSS incident reporting systems are in place, including the reporting of OHS/CHSS leading/lagging key performance indicators (KPIs) to the board of directors.</p> <p><b>(See reference documents 7, 8 and 26)</b></p>	<ul style="list-style-type: none"> <li>- Check that policies and procedures are in place to ensure all OHS and CHSS accidents, incidents and near misses are reported, classified and investigated.</li> <li>- Check lessons learned from fatal, major injury to near miss events involving employees and members of the public are documented.</li> <li>- Confirm that prioritised robust enduring solutions are in place to prevent a reoccurrence.</li> <li>- Check that key information on OHS and CHSS performance is provided to board.</li> <li>- Assess the information received by the board regularly on OHS and CHSS performance, injuries, and work-related ill health.</li> </ul>

## Case study 2: The need for governance and controls

### » Type of injury sustained:

Electrical burn injuries and fractured right leg.

### » Brief summary of incident:

A feeder tripped and a team was dispatched to investigate the fault. The team consisted entirely of contract workers. Upon site arrival, the team identified a problem at a pole-mounted transformer. The supervisor switched off the incoming power and instructed a team member to position a mobile tower ladder towards dropped-out transformer links.

Without confirming line isolation, and without using complete personal protective equipment (PPE) a linesman climbed the ladder. As soon as he compromised the safety distance near the links a flashover occurred, and the linesman fell from a height of approximately 12 feet, hitting the ladder during his fall. He sustained burn injuries on his left shoulder and abdomen, and fractured his right leg.

### » Key lessons learned:

Company boards and executive management teams must ensure that adequate corporate governance controls are put in place, implemented, and continuously reviewed, to ensure safe operation of, work on and access to the electricity network assets.

This must include the provision of competent supervision and compliance with safe systems of work, including contractors and subcontractors.

## INVESTOR DUE DILIGENCE/DECISION

Activity	Actions
<b>Objective: Identify poor network performance leading to OHS and CHSS risks not being effectively controlled</b>	
Conduct a robust third-party assessment of system performance and asset condition.	Appoint a competent party to carry out the assessment.
Check whether capital investment and operating expenditure plans are targeted and effective in the mitigation of business risk (over an acceptable period of time). <b>(See reference documents 8, 14 and 36)</b>	Ensure that the findings from the technical assessment are included in the capital and operating expenditure programmes.
Obtain the opinion of stakeholders (including communities and government organisations) on the company management of ESG risks, including OHS and CHSS. <b>(See reference document 7)</b>	<ul style="list-style-type: none"> <li>– Identify key stakeholders, including regulatory bodies and affected communities.</li> <li>– Conduct stakeholder consultation meetings to determine any stakeholder issues or concerns in relation to OHS and CHSS performance.</li> <li>– Determine long-term stakeholder engagement needs and plans.</li> </ul>
<b>Objective: Check legal and regulatory compliance</b>	
Assess the regulatory environment and check whether there are any outstanding or past prosecutions for offences or civil cases. <b>(See reference document 51)</b>	<ul style="list-style-type: none"> <li>– Check whether there are any outstanding or past prosecutions for OHS and CHSS-related offences.</li> <li>– Check the relevant legislation for the relevant country.</li> </ul>
Get the opinion of the regulator, comparing the company performance against regulatory standards.	Meet with the regulator to determine whether the company is meeting its regulatory obligations, and whether any concerns exist.

### » What about behavioural safety?

*“Cultural and behavioural interventions are only successful if engineering, technical and management systems are in place and working well. Behaviour should not be focused purely on the workforce, but must include organisational and management performance, and how they influence the behaviour of the workforce. It is therefore important for organisations to consider which aspects of health and safety a behavioural intervention may be able to influence.”*

**T&D OHS professional with 50 years’ T&D sector experience**

## PRE-CONSTRUCTION

Activity	Actions
<b>Objective: Design out risks</b>	
Review the application of relevant OHS and CHSS standards, and ensure they are integrated in the initial design phase. <b>(See reference documents 7, 11, 34, 35 and 45)</b>	Ensure relevant OHS and CHSS standards are integrated into the initial design phase, as a minimum, so that they are reflected in the construction, testing and operational stages.
<b>Objective: Procure safety</b>	
Health and Safety design principles to be included within procurement policies and procedures. <b>(See reference documents 13 and 14)</b>	<ul style="list-style-type: none"> <li>– Ensure the procurement of plant, equipment and competent resource that is fit for purpose to avoid risks.</li> <li>– Ensure the budgets proposed by suppliers/contractors include OHS arrangements.</li> </ul>

## CONSTRUCTION AND COMMISSIONING

Activity	Actions
<b>Objective: Monitor and review performance</b>	
Continually review OHS and CHSS performance including (but not limited to) non-compliance and accident and incident reporting and investigation. <b>(See reference documents 7 and 50)</b>	<ul style="list-style-type: none"> <li>– Ensure procedures are in place for the reporting and investigation of accidents, incidents and near misses.</li> <li>– Monitor and close-out actions from non-compliance and investigation reports.</li> </ul>
Develop a plan to close-out accident and incident learning points. <b>(See reference document 7)</b>	<ul style="list-style-type: none"> <li>– Check whether contractors have procedures in place for internal reviews of OHSS and CHSS performance.</li> <li>– Ensure procedures are in place to establish lessons learned and close-out of actions to deliver performance improvement.</li> </ul>
Develop procedures to rectify non-compliance issues in a consistent manner, including a code of conduct for workers with clearly defined sanctions for breach of code. <b>(See reference document 19)</b>	<ul style="list-style-type: none"> <li>– Develop policy and procedures that differentiate between human error and deliberate violations, and ensure a non-blame culture for cases of human error.</li> <li>– Include these in a code of conduct that documents the actions the company will take following error or violation.</li> <li>– Ensure the code of conduct includes appropriate safeguarding requirements with respect to CHSS.</li> <li>– Ensure effective communication with all employees.</li> </ul>



*“Structured frameworks should be in place to allow for competency assessment/grading of staff (including contractors) against defined competency levels”*

**Stakeholder interview (December 2020)**

## OPERATION AND MAINTENANCE

Activity	Actions
<b>Objective: Operate and maintain networks to prevent danger</b>	
<p>Establish an OHS and CHSS management system and plan to control and mitigate operational risks.</p> <p>(Note: management system to be based on principles of management control cycle of plan, do, check and act) <i>[See Case study 3]</i></p> <p><b>(See reference documents 7, 14, 53 and 62)</b></p>	<ul style="list-style-type: none"> <li>– Ensure the OHS and CHSS management system is established.</li> <li>– Ensure the management system includes the following:               <ul style="list-style-type: none"> <li>– Electrical safety rules with lock out tag out (LOTO) systems and permit-to-work (PTW) procedures.</li> <li>– Safe working procedures for working at heights.</li> <li>– Training and assessment of persons.</li> <li>– Risk assessment.</li> <li>– Requirement for adequate supervision.</li> <li>– Keeping and updating of records and single-line diagrams.</li> <li>– Identification and rectification of equipment defects.</li> <li>– Provision and use of PPE.</li> </ul> </li> </ul>
<p>Ensure the management system includes regular asset inspection, maintenance and recordkeeping policies and procedures.</p> <p><b>(See reference documents 13, 14, 45 and 46)</b></p>	<p>Check risk-based inspection and maintenance policies and procedures have been developed and implemented.</p>
<p>Establish asset risk management and HSES committees reporting to the board of directors.</p> <p><b>(See reference documents 7,46)</b></p>	<ul style="list-style-type: none"> <li>– Establish committees and monitor outputs to ensure risks are effectively managed and controlled.</li> <li>– Establish performance targets and regularly review achievements against targets.</li> </ul>

### Case study 3: Safe network operations

#### » Type of injury sustained:

Electrocution of a linesman working under a PTW safety document while installing a set of overhead line isolators.

#### » Brief summary of incident:

The isolators were being installed on a section of high voltage network with three points of isolation. The only circuit main earth applied was via a portable overhead line earth.

A ground-mounted earthing point was available, but this was subject to an operational restriction and not used. One of the points of isolation was a set of overhead line isolators which had failed to operate correctly (only two of the three phases had opened).

The senior authorised person did not confirm that all three phases had opened, due to the isolator pole being covered with vegetation. An auto recloser had operated during the isolator operation, but this was dismissed as a spurious operation by the system control engineer.

Following the issue of the PTW document, the control engineer closed the auto recloser, believing he was energising the high voltage overhead line only up to one of the points of isolation. This resulted in one phase of the network covered by the PTW to become energised.

The overhead line portable earth was ineffective, and the linesman was electrocuted.

#### » Key lessons learned:

Plant failure apart, the company should have had a defined policy to ensure safe operation of the electricity network, from which effective procedures could be derived and practiced by trained and competent employees. This proved not to be the case, with significant failures identified in all categories. These failures remained unidentified by the executive management team.

***In a number of areas, the company's operational safety management system was not being complied with.***

## 2.6 Level 2 matrix

This matrix is for senior managers and team leaders within T&D development and operating companies.

PRE-CONSTRUCTION: PROJECT DESIGN	
Activity	Actions
<b>Objective: Plan to mitigate risks</b>	
<p>Conduct detailed and effective planning at the project design stage to design out OHS and CHSS risks.</p> <p><b>(See reference documents 7 and 12)</b></p>	<ul style="list-style-type: none"> <li>– Effective planning and consenting are required at the project design stage, to ensure the project is clearly defined, and potential hazards during construction, commissioning, operation and maintenance are identified. The design should include community and stakeholder feedback gained through appropriate and adequate consultation as agreed in the stakeholder and community engagement plan.</li> <li>– The hazards identified must then be risk-assessed, considering local factors and, where possible, be designed out.</li> <li>– If this is not possible, rigorous and robust control measures must be developed to eliminate or reduce risk to an acceptable level, in line with the hierarchy of controls.<sup>3</sup></li> </ul>
<p>Assess the capabilities and experience of national or local contractors for effective OHS and CHSS risk management – supported by capacity building.</p> <p><b>(See reference documents 7 and 8)</b></p>	<ul style="list-style-type: none"> <li>– Project designs shall be reviewed relative to established design criteria and standards.</li> <li>– Deliverability of the project design must be consistent with the capabilities and experience of national or local contractors.</li> <li>– A decision whether to deliver the project in-house or contract the work will be required at this stage, and the risks associated with contracting the work must be assessed, and control measures implemented.</li> </ul>
<p>Plan and manage the procurement of products and services so that risks are minimised.</p> <p><b>(See reference documents 7 and 12)</b></p>	<ul style="list-style-type: none"> <li>– Ensure planning is carried out to manage the procurement of products and services so that risks are minimised, and the project is completed efficiently and safely.</li> <li>– The risks from the product or service in relation to the people who may be affected must be considered, including customers, members of the public, the company, and contract employees.</li> </ul>
<b>Objective: Design out risk</b>	
<p>Design, review and sign-off safety aspects relative to design criteria and national/international standards.</p> <p><b>(See reference documents 7 and 12)</b></p>	<ul style="list-style-type: none"> <li>– Design a review of major assets and equipment, including the ability to access, operate and maintain in a safe manner.</li> <li>– Design sign-off of safety aspects relative to design criteria and national and international standards and industry best practice is required, alongside sign-off by all stakeholders.</li> <li>– This process should include formal consents and permissions from wider stakeholder groups.</li> </ul>
<p>Assess technical aspects of the design so that installed equipment is fit for purpose.</p> <p><b>(See reference documents 4, 8 and 13)</b></p>	<ul style="list-style-type: none"> <li>– Carry out power system modelling to determine system load flows and fault levels.</li> <li>– This will ensure the installed equipment is fit for purpose in terms of load rating and fault duty.</li> <li>– Power system protection settings to be calculated based on study results.</li> </ul>
<p>Ensure the site selection process avoids or minimises OHS and CHSS risks.</p> <p><b>(See reference documents 28 and 38)</b></p>	<ul style="list-style-type: none"> <li>– Site selection study to be undertaken to identify suitable locations. The study should include site visits.</li> <li>– Ensure site selection complies with local and national planning and consenting requirements.</li> <li>– Ensure site selection is consistent with OHS and CHSS legislation and regulatory requirements.</li> <li>– Consider appropriate width of easement and clearance for each project, depending on the surrounding land use and socio-economic characteristics (for example, consider wider wayleaves through agricultural land with palm trees or using insulated Aerial Bundled Conductor (ABC) cables).</li> </ul>

<sup>3</sup> The 'hierarchy of controls' generally consist of five rungs: elimination; substitution; engineering controls; administrative controls; and personal protective equipment. The hierarchy is arranged beginning with the most effective controls and proceeds to the least-effective.

## PRE-CONSTRUCTION: PROJECT DESIGN

Activity	Actions
<b>Objective: Procure safety</b>	
<p>OHS and CHSS design principles are to be included within procurement policies and procedures.</p> <p><b>(See reference documents 8, 12, 27, 30, 42 and 45)</b></p>	<ul style="list-style-type: none"> <li>– Ensure that tender applications from manufacturers and suppliers – including the equipment and services they provide and deliver to the client – are safe for all users.</li> <li>– Ensure tender applications provide details of the budget for OHS and CHSS risk management.</li> <li>– Check whether the current and past performance of the product and service provider is considered as part of the procurement process.</li> <li>– Check whether the hazards associated with a product or service throughout its lifetime are considered as part of the decision-making process.</li> <li>– Ensure there is a local procurement policy at the organisation level and a specific plan at project level, including procurement of local goods and services and local workforce. The policy should also address training and capacity building for local businesses and workforce.</li> <li>– Ensure employment policy adheres to national law and IFC Performance Standard 2, and specifies minimum age of employment and targets for women within the workforce.</li> </ul>
<p>Ensure the procurement processes includes product and service life-cycle assessment to meet OHS and CHSS objectives.</p> <p><b>(See reference documents 8 and 15)</b></p>	<ul style="list-style-type: none"> <li>– The procurement process should provide value for money and exercise due diligence in meeting OHS and CHSS objectives.</li> <li>– Ensure performance improvements can be delivered throughout the duration of the contract.</li> <li>– Include OHS and CHSS design principles in procurement policies and procedures. This will assist in the elimination of hazards at the construction and operation and maintenance stages.</li> <li>– Ensure the procurement of plant and equipment complies with the technical design requirements in terms of fault rating and capacity.</li> </ul>
<b>Objective: Protect the community</b>	
<p>Plan land acquisition to avoid or minimise involuntary resettlement and relocation, as well as economic displacement.</p> <p><b>(See reference documents 16, 17, 18, 27, 39, 44 and 48)</b></p>	<ul style="list-style-type: none"> <li>– Through appropriate design interventions, thorough land use mapping and stakeholder and community engagement, avoid and minimise land requirement for the project.</li> <li>– Through a route selection options analysis process, select a route that will avoid or minimise physical resettlement of people, and any economic displacement and disruption to sources of livelihood.</li> <li>– If relocation of people and sources of livelihoods is unavoidable, the company should develop a Livelihood Restoration Plan (LRP) and Resettlement Action Plan (RAP) This should be developed in line with best practice such as national law and IFC Performance Standard 5, including the following:             <ul style="list-style-type: none"> <li>– Disclosure processes applying free, prior, informed consent (FPIC) principles.</li> <li>– Make provision for grievance redress.</li> <li>– Engagement of credible third-party valuers and provision of fair legal representation for all parties.</li> <li>– Negotiation of fair compensation (based at current market values).</li> <li>– Livelihood restoration planning and monitoring.</li> <li>– Other relocation assistance required for relocation and preparing appropriate legal agreements.</li> </ul> </li> <li>– The LRP and RAP should be commensurate to the level of impact. If impacts are small scale, then an abbreviated RAP should be considered. The LRP and RAP should consider informal settlers and users on the land.</li> <li>– Special consideration for impacts to vulnerable groups (women, children, the elderly, disabled, and any other disadvantaged group including minorities and indigenous groups), and develop specific measures to address impacts, including compensation and grievance mechanisms.</li> </ul>

## PRE-CONSTRUCTION: PROJECT DESIGN

Activity	Actions
<b>Objective: Protect the community</b>	
<p>Develop project-specific stakeholder and community engagement and a consultation plan addressing women, vulnerable groups – including a community grievance mechanism.</p> <p><b>(See reference documents 22, 23, 31, 33, 41, 47, and 59)</b></p>	<ul style="list-style-type: none"> <li>– Prepare a project-specific stakeholder and community engagement plan, based on robust stakeholder analysis of consultation with affected communities and adequate focus group discussions. This should include a grievances redress mechanism that adopts a survivor-centred approach.</li> <li>– Methods of consulting and engaging with the community should be culturally appropriate and delivered in a manner that is easily understood and accessed by the community, and where appropriate without payment, such as using toll-free phone numbers for communicating any grievances.</li> <li>– The plan should include a stakeholder and community feedback mechanism to inform project design and mitigate potential risks and impacts.</li> <li>– The plan should include a grievance redress mechanism with a clear investigation and response process and timeframes.</li> <li>– Ensure the company has a policy addressing gender-based violence and harassment (GBVH) risks and that these risks are considered for each project, with measures put in place to mitigate these risks where required.</li> <li>– Ensure all projects have a code of conduct for workers which addresses project expectations relating to interactions with the communities and GBVH, and with clearly defined sanctions for breaching the code.</li> <li>– Ensure workers are trained in, and understand, the code of conduct.</li> <li>– Provide and publicise the grievance redress mechanism for affected parties.</li> </ul>
<p>Conduct risk assessment of CHSS risks during the asset life-cycle.</p> <p><b>(See reference documents 22, 23, 31, 33, 41 and 47)</b></p>	<ul style="list-style-type: none"> <li>– Complete an early risk assessment of community safety and security risks along the project alignment.</li> <li>– Consider appropriate width of easement and clearance for each project depending on the surrounding land use and socio-economic characteristics (for example, consider wider wayleaves through agricultural land with palm trees or using insulated ABC cables).</li> </ul>



*“There is limited experience of international OHS requirements on construction works within Africa and therefore, a lot of time has been invested in the training of sub-contractors. Lots of contractors do not reinforce OHS requirements. A lot of due diligence and training is therefore required before appointing sub-contractors.”*

**Stakeholder interview (December 2020)**

## CONSTRUCTION AND COMMISSIONING PHASE

Activity	Actions
<b>Objective: Define and establish key roles and responsibilities</b>	
<p>Appoint competent persons to key roles and hold them accountable for the safe delivery of the project.</p> <p><b>(See reference documents 5, 8, 12 and 19)</b></p>	<ul style="list-style-type: none"> <li>– Clearly define and document the roles and responsibilities of key personnel.</li> <li>– Ensure roles and responsibilities are understood by the persons appointed to these roles.</li> <li>– Ensure roles are only allocated to persons who are trained and competent to carry them out.</li> </ul>
<p>Ensure the selection and appointment of competent contractors with the necessary OHS and CHSS management competencies, policies, plans and control measures.</p> <p><b>(See reference documents 15 and 20)</b></p>	<ul style="list-style-type: none"> <li>– Ensure the project objectives are realistic and the tender sets out clearly the scope of work, to enable competent contractors to deliver the project on time and within budget, without compromising OHS and CHSS standards.</li> <li>– Develop rigorous and robust contractor selection criteria to include evaluation of current and past OHS and CHSS performance.</li> <li>– Ensure that tender assessment considers OHS and CHSS budgets within tender applications, and that the evaluation criteria includes appropriate weighting for OHS and CHSS.</li> <li>– Where OHSS and CHSS evaluation criteria are not met, ensure the tenderer does not proceed to technical and financial evaluation stage.</li> <li>– The appointed contractor will prepare a sub-contractor management plan and a recruitment plan which includes specific local content requirements, ensuring that local labour is recruited at every worksite.</li> </ul>
<p>Assess the competence, training, and certification of the workforce, including sub-contractors, and develop a plan to close any gaps.</p> <p><b>(See reference documents 5, 8 and 19)</b></p>	<ul style="list-style-type: none"> <li>– Ensure persons employed for construction activity are suitably trained and assessed as competent to carry out the tasks they are allocated.</li> <li>– Ensure this also applies to sub-contractor personnel.</li> <li>– Ensure that where the contractor employs local semi-skilled and unskilled workers they are properly trained and supervised.</li> <li>– Ensure that arrangements are in place to enable competent health and safety advice to be provided.</li> </ul>



*“Staff competence is trained in-house after some external training was assessed as being inadequate.”*

**Stakeholder interview (December 2020)**

## CONSTRUCTION AND COMMISSIONING PHASE

Activity	Actions
<b>Objective: Establish a safe and secure worksite</b>	
<p>Identify hazards associated with the worksite and carry out OHS and CHSS risk assessments to mitigate such hazards. <b>(See reference documents 5, 8 and 12)</b></p>	<ul style="list-style-type: none"> <li>– When establishing the worksite, it is essential that all site-specific hazards are identified (such as working at height, using mechanical equipment, electrical hazards, hazardous and dangerous materials).</li> <li>– Following a risk assessment of the hazards, implement control measures in line with the defined hierarchy of controls.</li> <li>– Conduct regular monitoring to ensure the control measures continue to be in place and remain fit for purpose.</li> <li>– Ensure that emergency response plans are readily available. These should include: first aid and medical treatment; use of firefighting equipment and evacuation; and the suspension of work.</li> <li>– Employee welfare arrangements must be established. Construction sites should be provided with adequate welfare and sanitation facilities, including first aid and the identification of personnel with first aid training.</li> </ul>
<p>Ensure safe access and egress routes to and from work locations. <b>(See reference documents 49 and 57)</b></p>	<p>Working areas should be controlled with procedures established for access and egress to and from work areas.</p>
<p>Ensure all work is properly supervised and carried out in accordance with site and task-specific risk management plans by competent people. <b>(See reference documents 5, 8 and 21)</b></p>	<ul style="list-style-type: none"> <li>– Methods to control contractor activities: contractors should produce suitable and adequate risk assessments and prepare method statements for all construction activities.</li> <li>– Develop and implement an OHS and CHSS audit policy, procedure and programme.</li> <li>– Review audit findings and take appropriate action to rectify unsafe acts and conditions as necessary.</li> <li>– Tasks to be undertaken with lone working should be assessed as consistent with the risks to personnel, and additional measures put in place as necessary.</li> <li>– OHS requirements should be set in advance of construction commencing, the requirements should be task-appropriate and PPE requirements should be considered.</li> </ul>
<p>Ensure robust change management procedures are established and followed (including design, location, and pre-commissioning checks). <b>(See reference documents 7 and 19)</b></p>	<ul style="list-style-type: none"> <li>– Ensure that any required changes to the design, location or other aspects of the project scope are clearly identified and communicated to all stakeholders.</li> <li>– Ensure such changes are managed in accordance with defined change management procedures.</li> <li>– Carry out a pre-commissioning audit where all physical and design execution is double-checked and corrected (if necessary) before commissioning for operation.</li> <li>– The commissioning of assets usually involves a change of state. As assets can become energised during testing it is necessary that access controls are in place throughout the process, to ensure that only persons involved in the testing have access to the testing area.</li> <li>– Upon completion of satisfactory testing, the assets will be connected to the network and become operational under system safety rules.</li> <li>– It is vitally important that all persons involved in the construction of the assets are made aware of the change of state.</li> <li>– The newly-commissioned assets must be physically segregated from the testing area and from assets still under construction.</li> </ul>

## CONSTRUCTION AND COMMISSIONING PHASE

Activity	Actions
<b>Objective: Monitor and review performance (including contractors and sub-contractors)</b>	
<p>Continually review OHS and CHSS performance, including non-compliance, as well as accident and incident reporting and investigation.</p> <p><b>(See reference documents 7 and 50)</b></p>	<ul style="list-style-type: none"> <li>– Implement systems for the reporting and investigation of accidents, incidents and near-misses, and monitor their use and effectiveness.</li> <li>– Ensure the close-out actions from non-compliance and investigation reports are carried out.</li> <li>– Ensure performance targets are set and that achievements are monitored.</li> </ul>
<p>Develop a plan to close-out accident and incident learning points.</p> <p><b>(See reference documents 7 and 26)</b></p>	<ul style="list-style-type: none"> <li>– Ensure that contractors follow defined procedures for internal review of OHSS and CHSS performance.</li> <li>– Implement procedures to ensure lessons learned and close-out actions aimed at delivering performance improvement.</li> </ul>
<p>Develop procedures to rectify non-compliance issues in a consistent manner, including a code of conduct for workers with clearly-defined sanctions for breach of code.</p> <p><b>(See reference document 19)</b></p>	<ul style="list-style-type: none"> <li>– Implement policy and procedures that differentiate between human error and deliberate violations.</li> <li>– Follow the code of conduct that documents the actions the company will take following human error or violation. The implementation of a non-blame culture is important so as not to discourage reporting.</li> <li>– Ensure effective communication to all employees.</li> </ul>
<b>Objective: Protect the community</b>	
<p>Ensure the local community is protected from risk associated with the employment of non-local or migrant project workers.</p> <p><b>(See reference documents 22, 23 and 59)</b></p>	<ul style="list-style-type: none"> <li>– Prepare and implement a workforce management plan, including giving preference to engaging local workforce; training for capacity building to maximise local workforce; developing and implementing a workers' code of conduct; and ensuring all workers understand it through an appropriate induction programme.</li> <li>– Implement awareness programmes to prevent any project-related increase in GBVH, and avoid or minimise the spread of communicable and sexually transmitted diseases.</li> <li>– Have in place a grievance redress mechanism that is known by, and is easily accessible to, all stakeholders, and allows for anonymous reporting, including for any safeguarding incidents.</li> </ul>
<p>Ensure the worksite is kept secure from inadvertent or deliberate third-party access.</p> <p><b>(See reference documents 14, 25 and 33)</b></p>	<ul style="list-style-type: none"> <li>– Ensure contractors and company staff understand that safe systems of work are to be followed to reduce the risk of an injury or incident occurring to a member of the public.</li> <li>– Carry out worksite security risk assessments and implement control measures to mitigate risks.</li> <li>– Prepare and implement a construction management plan which will minimise safety risks for the community by restricting access to construction sites and machinery; establishing adequate safety signs; and informing the community of safety risks as part of the project's information disclosure programme.</li> <li>– Prepare a stakeholder engagement plan and a community engagement plan, including emergency response process and practical communication methods such as toll-free phone numbers and a works management centre.</li> <li>– Establish a community grievance redress mechanism that is known by, and is easily accessible to, all stakeholders, and allows for anonymous reporting of any safeguarding incidents.</li> </ul>

## CONSTRUCTION AND COMMISSIONING PHASE

Activity	Actions
<b>Objective: Protect the community</b>	
<p>Ensure security personnel operate in line with the UN Basic Principles on the Use of Force and Firearms by security personnel when dealing with trespass incidents.</p> <p>Where site security is required, develop a security management plan aligned to UN Guiding Principles on Business and Human Rights.</p> <p><b>(See reference document 24)</b></p>	<ul style="list-style-type: none"> <li>– The construction contractor will implement measures to limit the risk of security personnel using excessive force. Measures would include development of a security management plan aligned to UN Guiding Principles on Business and Human Rights, where site security is required:</li> <li>– Ensuring that the engaged security firm is licensed with the country.</li> <li>– Making reasonable enquiries that personnel are not implicated in past abuses.</li> <li>– Confirming that personnel have been trained in the use of force, and where they have not, offering or contracting another party to supply this training.</li> <li>– Requiring that security personnel act within applicable law.</li> <li>– Security personnel must be trained in, and adhere to, the workforce code of conduct, including provisions for community customs, child protection and GBVH.</li> <li>– Ensure that the project grievance redress mechanism provides a basis for the community to raise concerns regarding the behaviour of security personnel.</li> </ul>
<p>Ensure living conditions at worker camps are established in line with relevant standards.</p> <p><b>(See reference documents 27, 29, 40, 41, 54, 58 and 59)</b></p>	<ul style="list-style-type: none"> <li>– Establish policies in accordance with IFC Performance Standard 2 that stipulate a minimum standard regarding the quality and management of accommodation services for the construction contractor to implement.</li> <li>– Ensure plans consider separate provisions for women and consideration of GBVH risks.</li> <li>– Ensure that stipulated standards are included as part of the tendering process for the construction contractor, and included as contract terms and conditions of the construction contractor.</li> </ul>
<p>Minimise risk of potential community conflict by engaging a local workforce from surrounding communities in accordance with a transparent recruitment plan.</p> <p><b>(See reference document 31)</b></p>	<ul style="list-style-type: none"> <li>– Prepare and implement a workforce management plan. This should include:             <ul style="list-style-type: none"> <li>– Developing a transparent recruitment plan in consultation with the local communities.</li> <li>– Considerations on how to ensure inclusion and diversity during recruitment.</li> <li>– Giving preference to engaging local workforce.</li> <li>– Training for capacity building to maximise local workforce.</li> <li>– Developing, implementing and training in a workers' code of conduct.</li> <li>– Ensuring all workers understand the code of conduct through an appropriate induction programme.</li> </ul> </li> </ul>



*“It is important that the communities understand the project and its need. Local community stakeholder buy-in reduces and prevents unauthorised interference and the development of issues in the long term.”*

**Stakeholder interview (December 2020)**

## CONSTRUCTION AND COMMISSIONING PHASE

Activity	Actions
<b>Objective: Protect children</b>	
<p>Develop and consult with local communities on a recruitment process with defined minimum age requirements for employment.</p> <p><b>(See reference documents 27, 30 and 31)</b></p>	<ul style="list-style-type: none"> <li>– Ensure employment policy adheres to national law and IFC Performance Standard 2, and specifies a minimum age of employment within the workforce.</li> <li>– Inform affected communities of age requirements for project employment as part of the project awareness and recruitment programme.</li> </ul>
<p>Develop and implement a community and schools education programme (including the option of workshops at site location) for electrical and site safety.</p> <p><b>(See reference documents 30 and 31)</b></p>	<ul style="list-style-type: none"> <li>– Prepare an ongoing community and schools education programme to ensure they are informed of the dangers relating to:               <ul style="list-style-type: none"> <li>– Safety around construction sites.</li> <li>– Electrocutation caused by accidentally touching live powerlines.</li> <li>– Electrocutation caused by fallen powerlines.</li> <li>– Injuries and electrocutation due to vandalism or trespassing on power infrastructure and traffic accidents or collisions with T&amp;D infrastructure.</li> <li>– Electrocutation due to parking vehicles or performing other activities under powerlines.</li> <li>– Illegal connections and/or theft of electricity from the distribution network, leading to electrocutation.</li> </ul> </li> </ul>

## OPERATION AND MAINTENANCE

Activity	Actions
<b>Objective: Operate and maintain networks to prevent danger</b>	
<p>Establish an OHS and CHSS management system and plan to control and mitigate operational risks.</p> <p><b>(See reference documents 7, 13, 14, 37)</b></p> <p>Note: the management system should be based on the principles of management control cycle of plan, do, check and act.</p>	<ul style="list-style-type: none"> <li>– Establish and implement an OHS and CHSS management system, and plan to control and mitigate operational risks.</li> <li>– Electricity networks must be constructed, operated, and maintained to prevent danger. This requirement must include every work activity, including operation, use and maintenance of a system and work near a system.</li> <li>– Any equipment provided for protecting persons at work (such as PPE) must be available and free of charge for the workers, fit for purpose, maintained in good condition, and properly used.</li> <li>– This requirement covers: design and construction of the network; operating the network; working on the network; access to the network; and equipment provided.</li> <li>– Work of a non-electrical nature (such as vegetation management in proximity to overhead lines, or excavation near underground cables) where the risks can be severe must be included in the requirement.</li> <li>– Persons required to operate, work on, or access the network must be properly trained and assessed as competent to carry out the tasks they are required to perform, and be subjected to periodic refresher training and assessment.</li> </ul>
<p>Ensure the management system includes regular asset inspection, maintenance and record-keeping policies and procedures.</p> <p><b>[See Case studies 4 and 5]</b></p> <p><b>(See reference documents 13, 14, and 45)</b></p>	<ul style="list-style-type: none"> <li>– Regular inspection and maintenance of network assets is critical and must be specified in policies and procedures, as well as records kept.</li> <li>– Establish and implement procedures to identify, manage and remediate equipment failure and defects, including a procedure to impose and remove operational restrictions.</li> <li>– Temporary power system running conditions must be documented and communicated to operational staff.</li> </ul>

## OPERATION AND MAINTENANCE

Activity	Actions
<b>Objective: Operate and maintain networks to prevent danger</b>	
Establish asset risk management and HSES committees reporting to the board of directors. <b>(See reference document 7)</b>	<ul style="list-style-type: none"> <li>– Establish a HSES committee reporting to the board, with roles and responsibilities defined.</li> <li>– Provide visibility to the board of the effectiveness of how key asset-related risks are being identified, mitigated, and controlled.</li> </ul>
Establish an OHS and CHSS training programme for all operational staff. <b>(See reference document 19)</b>	<ul style="list-style-type: none"> <li>– Clearly define roles and responsibilities of operational staff for OHS and CHSS.</li> <li>– Develop and implement a training and assessment programme.</li> <li>– Levels of training and certification, and methods for creating and monitoring records should be set.</li> <li>– Ensure training and any training aids are provided in a form that can be understood by trainers and trainees.</li> </ul>

### Case studies 4 and 5: Keeping networks safe

#### » Type of injury sustained:

A member of the public who was out jogging was fatally injured by a low hanging 11 kilovolt (kV) overhead line conductor.

#### » Brief summary of incident:

The man ran into an 11kV overhead line conductor that was suspended 1.5 metres above ground, across a public footpath. An insulator had broken, and the conductor fell but was suspended at 1.5 metres, so no power system protection operated. He died at the scene.

#### » Key lessons learned

*"The risks posed by high voltage conductors which descend below the safe statutory height are entirely foreseeable and network operators must have robust procedures in place that facilitate dynamic risk assessment and the immediate implementation of effective risk control measures to protect the public." HSE principal inspector*  
 Source: IOSH Magazine (2016)

#### » Type of injury sustained:

Major injuries and fatalities involving decayed overhead line poles.

#### » Brief summary of incident:

A number of incidents have occurred where linesmen have climbed decayed poles which have then fallen with the climber attached. Such incidents have caused major or fatal injuries to the climber, or people on the ground who have been struck by the falling pole.

#### » Key lessons learned:

- Essential to check and test poles for signs of decay prior to climbing, and look for signs indicating a pole has been marked as defective.
- Do not fail to adequately manage risks associated with defective poles.
- Always follow the hierarchy of access methods when working at height.

**Asset management procedures need to ensure that decayed poles are effectively identified, recorded and removed, or replaced in a timely manner.**



*"Having effective procedures in place, such as carrying out preventive maintenance, have helped to mitigate potential asset failures."*

**Stakeholder interview (December 2020)**

## OPERATION AND MAINTENANCE

Activity	Actions
<b>Objective: Secure the assets and protect the public</b>	
<p>Ensure that members of the public are prevented from gaining access to network assets.</p> <p><b>(See reference documents 4, 6, 14 and 25)</b></p>	<ul style="list-style-type: none"> <li>– It is an essential requirement that, where practicable, members of the public are prevented from gaining access to network assets.</li> <li>– Substation premises must be enclosed, and danger notices fixed to the boundary walls or fences.</li> <li>– Overhead line poles and tower structures should have danger notices attached, and have anti climbing measures installed where required.</li> <li>– Implement ongoing community and school education programmes warning people of the dangers of unauthorised access and contact.</li> </ul>
<p>Prepare and implement an operations specific stakeholder and community engagement and consultation plan.</p> <p><b>[See Case study 6]</b></p> <p><b>(See reference documents 32 and 55)</b></p>	<ul style="list-style-type: none"> <li>– Conduct early risk assessment of community safety and security risks along the project alignment.</li> <li>– Implement ongoing, regular awareness programmes with all stakeholders including school education, and initiate public information campaigns in local languages using radio, posters, and signs that promote safe behaviour and warn of the dangers of electricity.</li> <li>– Introduce toll-free emergency telephone numbers to facilitate reporting of incidents or emergencies.</li> <li>– Educate neighbouring businesses in risk assessment and the hierarchy of controls.</li> <li>– Provide free training material and training for stakeholders at high risk.</li> <li>– Establish a grievance redress mechanism.</li> <li>– Develop and implement an emergency response plan.</li> </ul>
<p>Ensure operational and maintenance practices that include specific initiatives to deter, identify and resolve illegal practices and the significant CHSS and OHS consequences.</p> <p><b>(See reference documents 30 and 31)</b></p>	<p>Develop and implement a procedure and training programme that facilitates meter readers, network operators and the community, to identify and report on theft and illegal activity.</p>

### Case study 6: Community awareness

#### » Type of injury sustained:

Electrocution of a member of the public.

#### » Brief summary of incident:

A 15-year-old school pupil came into contact with a non-standard conductor, used to illegally supply electricity to a school.

#### » Key lessons learned:

Companies must have training and awareness programmes in place for members of staff that visit customers premises, to enable them to recognise illegal connections and report them.

In addition, customer awareness and engagement programmes – including school visits – must be implemented to raise awareness of the dangers of electricity, and encourage the reporting of illegal activity.



*“Education of local communities is important as they may not be aware, for example, that higher voltage lines can arc, and the conductors are not covered in insulation.”*

**Stakeholder interview (December 2020)**

## OPERATION AND MAINTENANCE

Activity	Actions
<b>Objective: Manage the operational and public safety risks associated with danger from overhead lines</b>	
<p>Introduce a comprehensive inspection and remediation process, and training and awareness for operational staff and communities, including children.</p> <p><b>(See reference documents 30, 31 and 53)</b></p>	<ul style="list-style-type: none"> <li>– Implement effective inspections and reporting procedures.</li> <li>– Install danger signage.</li> <li>– Install physical barriers to protect the public from danger.</li> <li>– Prepare an ongoing community and schools education programme to ensure people are informed of the dangers relating to:               <ul style="list-style-type: none"> <li>– Electrocutation caused by accidentally touching live powerlines.</li> <li>– Electrocutation caused by fallen powerlines.</li> <li>– Injuries and electrocutation due to vandalism or trespassing on power infrastructure and traffic accidents or collisions with T&amp;D infrastructure.</li> <li>– Electrocutation due to parking vehicles or performing other activities under powerlines.</li> <li>– Illegal connections and/or theft of electricity from the distribution network, leading to electrocutation.</li> </ul> </li> <li>– Community awareness requires mechanisms or incentives to report issues when observed. Items to report include:               <ul style="list-style-type: none"> <li>– Vegetation growth near conductors.</li> <li>– Wood poles which are cracked, damaged or leaning, or being attacked by insects/termites.</li> <li>– Obvious defects, such as damaged strands on conductors, splits in cross arms or damaged insulators.</li> <li>– Wires hanging low or broken.</li> </ul> </li> </ul>
<p>Develop a safety mitigation strategy for managing assets, taking into account historical asset condition and technology-related risks.</p> <p><b>(See reference documents 13, 14, 19, 38 and 45)</b></p>	<ul style="list-style-type: none"> <li>– Effectively target capital expenditure (CAPEX) and operational expenditure (OPEX) programmes to mitigate risks.</li> <li>– Develop a policy for replacing and removal of operational restrictions.</li> <li>– Develop a policy and procedure for identification and rectification of system defects.</li> <li>– Implement a policy to prevent access to high-risk areas until defects have been rectified.</li> <li>– Overhead lines are one of the most significant risks and causes of accidents and fatalities. The inspection of pole and conductor condition is an essential requirement, and it is vital inspections are carried out by suitably trained and competent workers to ensure any safety critical issues are identified and reported.</li> <li>– Pole assessment needs to consider the characteristics of different pole materials (wood, metal, concrete) and the impact of the environmental conditions (see Appendix 8 for further guidance on managing risks relating to poles).</li> <li>– Risks associated with transformer oils (PCBs, fire, or explosion) together with pressurised equipment (particularly containing sulphur hexafluoride (SF<sub>6</sub>)) to be considered.</li> <li>– Consider appropriate width of easement and clearance for each project, depending on the surrounding land use and socio-economic characteristics (for example, consider wider wayleaves through agricultural land with palm trees or using insulated ABC cables).</li> <li>– Note: where networks are particularly hazardous due to historic under-investment, there should be a transformational paradigm which will require a bottom-up approach to risk identification and prioritisation.</li> </ul>



# 03

## List of references and external publications

### 3.1 References

A1		<a href="#"><u>Appendix 1: Health and safety leadership – core actions checklist</u></a>
A2		<a href="#"><u>Appendix 2: Good practice – health and safety leadership</u></a>
A3		<a href="#"><u>Appendix 3: Questionnaire on health and safety leadership</u></a>
A4		<a href="#"><u>Appendix 4: Technical due diligence – essential controls to facilitate safe operation of the power network</u></a>
A5		<a href="#"><u>Appendix 5: Safe management of contracts – essential components</u></a>
A6		<a href="#"><u>Appendix 6: Asset condition – critical mitigation measures checklist</u></a>
A7		<a href="#"><u>Appendix 7: HSES Committee Terms of Reference</u></a>
A8		<a href="#"><u>Appendix 8: Additional guidance relating to pole strategies</u></a>
7	HSE	<a href="#"><u>HSE 65: Managing for health and safety</u></a>
8	ISSA	<a href="#"><u>Guidance on the Safe Management of Contracts</u></a>
9	HSE	<a href="#"><u>OHS and CHSS governance and compliance</u></a>
10	HSE	<a href="#"><u>OHS and CHSS management roles and responsibilities: company health and safety business interfaces</u></a>
11	World Bank	<a href="#"><u>World Bank EHS Guidelines</u></a>
12	HSE	<a href="#"><u>The Construction (Design and Management) Regulations 2015</u></a>
13	HSE	<a href="#"><u>The Electricity at Work Regulations 1989</u></a>
14	HSE	<a href="#"><u>Electricity Safety, Quality and Continuity Regulations (ESQCR)</u></a>
15	IFC	<a href="#"><u>Good Practice Note: Managing Contractors' Environmental and Social Performance</u></a>
16	IFC	<a href="#"><u>Handbook for Preparing a Resettlement Action Plan</u></a>
17	IFC	<a href="#"><u>Guidance Note 7: Indigenous Peoples (corresponding to IFC Performance Standard 7)</u></a>
18	IFC	<a href="#"><u>IFC Performance Standard 5: Land Acquisition and Involuntary Resettlement</u></a>
19	HSE	<a href="#"><u>The Management of Health and Safety at Work Regulations 1999</u></a>
20	FIDIC	<a href="#"><u>FIDIC Procurement Procedures Guide 1st Ed. (2011)</u></a>
21	HSE	<a href="#"><u>Lone working: Protect those working alone</u></a>

22	Australian Government	<a href="#"><u>Preventing Sexual Exploitation, Abuse and Harassment Policy</u></a>
23	ACFID	<a href="#"><u>Guidance for the Development of a Prevention of Sexual Exploitation, Abuse and Harassment Policy</u></a>
24	UN	<a href="#"><u>Basic Principles on the Use of Force and Firearms by Law Enforcement Officials</u></a>
25	ENA	<a href="#"><u>Guidance on Security of Substations, Cable Bridges &amp; Cable Tunnels</u></a>
26	ISSA	<a href="#"><u>Guidance for the Management of Health and Safety Performance</u></a>
27	IFC	<a href="#"><u>Performance Standards</u></a>
28	IFC	<a href="#"><u>Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution</u></a>
29	IFC	<a href="#"><u>Environmental, Health, and Safety Guidelines</u></a>
30	IFC	<a href="#"><u>IFC Performance Standard 2: Labour and Working Conditions</u></a>
31	IFC	<a href="#"><u>Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets</u></a>
32	IFC	<a href="#"><u>Stakeholder Identification and Analysis</u></a>
33	IFC	<a href="#"><u>Addressing Grievances From Project-Affected Communities</u></a>
34	ISSA	<a href="#"><u>Vision Zero Guide: Seven Golden Rules to implement the Vision Zero strategy in the Electricity Industry</u></a>
35	ISSA	<a href="#"><u>Vision Zero: 7 Golden Rules – for zero accidents and healthy work</u></a>
36	ISSA	<a href="#"><u>The return on prevention: Calculating the costs and benefits of investments in occupational safety and health in companies</u></a>
37	World Bank	<a href="#"><u>World Bank EHS Guidelines</u></a>
38	HSE	<a href="#"><u>Avoiding danger from overhead power lines</u></a>
39	World Bank	<a href="#"><u>Timor/Leste Road - Land Acquisition and Resettlement Action Plan</u></a>
40	UN FAO	<a href="#"><u>Free Prior and Informed Consent: An indigenous peoples' right and a good practice for local communities</u></a>
41	African Development Bank	<a href="#"><u>Gender Policy and Action Plan</u></a>
42	CDC	<a href="#"><u>ESG Toolkit - Investment Cycle: Guidance on integrating ESG considerations into the investment cycle of a private equity fund</u></a>
43	CDC	<a href="#"><u>CDC Good Practice: Preventing Fatalities and Serious Accidents.</u></a>
44	CDC	<a href="#"><u>Sector profiles: Power</u></a>
45	OSTI.Gov	<a href="#"><u>The design, construction, and operation of long-distance high-voltage electricity transmission technologies</u></a>
46	Horizon Power	<a href="#"><u>Electricity Network Safety Management System</u></a>
47	European Bank	<a href="#"><u>Environmental and Social Guidance Note for Hydropower Projects</u></a>
48	Equator Principles	<a href="#"><u>The Equator Principles</u></a>
49	Electra	<a href="#"><u>Guidelines for safe work methods in substations</u></a>
50	ILO	<a href="#"><u>Difficulties of recording and notification of accidents and diseases in developing countries</u></a>
51	ILO	<a href="#"><u>National profiles on occupational safety and health</u></a>
52	SHE	<a href="#"><u>SHE Standard 07 Model Distribution Safety Rules</u></a>
53	HSES	<a href="#"><u>HSES Life-Saving Rules</u></a>
54	PIDG	<a href="#"><u>HSES safeguarding rules</u></a>
55	NERC	<a href="#"><u>Nigerian Electricity Supply and Installation Standards Regulations 2015</u></a>
56	IOD	<a href="#"><u>Leading health and safety at work</u></a>
57	HSE	<a href="#"><u>Health and Safety at Work etc Act 1974</u></a>
58	UK Gov	<a href="#"><u>The Workplace (Health, Safety and Welfare) Regulations 1992</u></a>
59	CDC	<a href="#"><u>Addressing Gender-Based Violence and Harassment</u></a>
60	ISSA	<a href="#"><u>Guidance for the Management of Health and Safety Performance</u></a>

### IFC Performance Standards



*Creating Markets, Creating Opportunities*

The IFC's Performance Standards define its clients' responsibilities for managing their environmental and social risks. They underscore the importance of managing environmental and social performance throughout the life-cycle of a project, by using an effective Environmental and Social Management System (ESMS). IFC Performance Standards applies to business activities with environmental and/or social risks and/or impacts, and focus on eight key areas: Risk Management; Labour; Resource Efficiency; Community; Land Resettlement; Biodiversity; Indigenous People; and Cultural Heritage.

[IFC Performance Standards](#)

### ISSA: Vision Zero - 7 Golden Rules Guide to employers and managers



*International Section for Electricity, Gas and Water*

The Vision Zero 7 Golden Rules published by the International Social Security Association (ISSA) is a transformational approach to prevention that integrates the three dimensions of safety, health and wellbeing at all levels of work. The concept is flexible and can be adjusted to the specific safety, health, or wellbeing priorities for prevention in any given context. Thanks to this flexibility, Vision Zero is beneficial to any workplace, enterprise or industry, in all regions of the world.

1. Take leadership – demonstrate commitment
2. Identify hazards – control risks
3. Define targets – develop programmes
4. Ensure a safe and healthy system – be well-organised
5. Ensure safety and health in machines, equipment and workplaces
6. Improve qualifications – develop competence
7. Invest in people – motivate by participation

[Vision Zero: 7 Golden Rules & Guides](#)

### ISSA: Vision Zero Guide for the electricity industry



*International Section for Electricity, Gas and Water*

ISSA's Vision Zero is the vision of a world without occupational accidents and work-related diseases. Its highest priority is to prevent fatal and serious work accidents and occupational diseases. VISION ZERO is the goal of a comprehensive culture of prevention.

[Seven Golden Rules to implement the VISION ZERO strategy in the Electricity Industry](#)

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## ISSA: The return on prevention



In 2010, ISSA, the German Social Accident Insurance (DGUV), and the German Social Accident Insurance Institution for the Energy, Textile, Electrical and Media Products Sectors (BG ETEM) initiated a study: “Calculating the international return on prevention for companies: Costs and benefits of investments in occupational safety and health”.

The international study looked at the question of how occupational safety and health is beneficial to companies. Answering this core question required that conceptual consideration be given to the idea of prevention accounting. It also required the collection of qualitative and quantitative data regarding the success of prevention.

This report summarises the initial results of the study. The International Social Security Association rated the Return on Prevention (ROP), across a number of countries, with the average ROP was 2.20. In practice, this means that for every single euro (or any other currency) per employee per year invested by companies in workplace prevention, companies can expect a potential economic return of €2.20 (or any other currency).

[The return on prevention: Calculating the costs and benefits of investments in occupational safety and health in companies \(2011\)](#)

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## ISSA: Guidance on safe management of contracts



ISSA's guidance on the safe managements of contracts provides advice to both client and contractor, as they strive to meet their legal obligations with respect to European legislation. The guidance places equal emphasis on the roles and expectations of both client and contractor, and outlines the means for achieving a successful contractual outcome in the most efficient, cost-effective and safe manner. The guidance illustrates how this can be achieved through a contract lifecycle model that sets out the required stages comprising the awarding, management, and implementation of contracts.

[ISSA: Guidance on the Safe Management of Contracts: A Contract Lifecycle Approach](#)

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## ISSA: Guidance for the management of health and safety performance



The purpose of this document is to empower and improve the human performance of middle managers in health and safety management within the electricity industry.

Although the guidance is intended primarily for middle-level management in the electricity industry, it should also be referred to by senior management because of the potential impact of decisions that they make on middle management.

[ISSA: Guidance for the management of health and safety performance](#)

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## HSE 6: Avoiding danger from overhead power lines



This guidance is for people who may be planning to work near overhead lines where there is a risk of contact with the wires, and describes the steps that should be taken to prevent contact. It is primarily aimed at employers and employees who are supervising or in control of work near live overhead lines, but will also be useful for those who are carrying out the work.

[Health and Safety Executive: Avoiding danger from overhead powerlines \(2013\)](#)

## HSE 65: Managing for health and safety



This guide is for leaders, owners and line managers, and will help those who need to put in place or oversee their organisation's health and safety arrangements. The advice may also help workers and their representatives, as well as health and safety practitioners and training providers.

The guidance explains the 'Plan, Do, Check, Act' approach, and shows how to achieve a balance between the systems and behavioural aspects of management. It also treats health and safety management as an integral part of good management generally, rather than as a stand-alone activity.

[Health and Safety Executive: Managing for health and safety \(2013\)](#)

## PIDG: Life-saving rules



The booklet sets out 12 life-saving rules that PIDG applies to its projects, its companies and its people. It draws attention to the activities most likely to lead to a fatality, and the life-saving actions over which an individual normally has control.

[PIDG: HSES Life-Saving Rules - Changing Lives, Saving Lives](#)

### ALL 12 LIFE-SAVING RULES (LSR)



## PIDG: HSES safeguarding rules



The HSES safeguarding rules are a set of ten rules designed to ensure safeguarding processes are in place across all PIDG projects, protecting the fundamental rights and wellbeing of workers and the worker community interface, specifically in regard to incidents of GBVH, modern slavery, and child labour arising in their projects and supply chain.

The rules have been established to provide mechanisms and controls to mitigate against human rights risks within projects. They are not intended to be exhaustive, but rather to seek to ensure PIDG has the fundamental controls and mitigations in place to help minimise risk and provide a safe place of work, protect the rights and wellbeing of workers, and ensure safe and respectful interaction between workers and communities.

The rules complement PIDG's Life-saving rules designed to protect the health and safety of its project workers.

### [PIDG: HSES safeguarding rules - Changing lives, protecting lives](#)





# 04

## Appendices

### Appendix 1: Health and safety leadership – core actions checklist

Step	Core actions	Reasons for core actions	Current approach	Action required?
Plan	<p>Have the significant risks faced by the company been identified, prioritised and included in a weighted risk matrix?</p> <p>Have the persons responsible for mitigating these risks been identified in the matrix and do they understand what they must do?</p>	<p>This will enable the company to formulate a strategy and a plan that indicates the risks are understood, prioritised and controlled.</p>		
	<p>Check the health and safety policy sets out the board's role (and that of individual directors) in leading the health and safety of the company. The board should:</p> <ul style="list-style-type: none"> <li>– Own and understand the key issues involved; and</li> <li>– Decide how best to communicate, promote and champion health and safety.</li> </ul>	<p>This will clearly demonstrate to all stakeholders that the company is committed to complying with its legal obligations, and is committed to ensuring the health, safety and welfare of its employees and members of the public.</p>		
	<p>Ensure the health and safety policy evolves over time (e.g., following major organisational changes).</p> <p>Check that the funding for the project allows for a plan to address the risks over an acceptable time period.</p>			

Step	Core actions	Reasons for core actions	Current approach	Action required?
<b>Execute</b>	Take responsibility and ownership of health and safety, by ensuring that health and safety arrangements are adequately resourced. <ul style="list-style-type: none"> <li>– Competent health and safety advice is obtained.</li> <li>– Risk assessments are carried out; and employees and their representatives are involved in decisions that affect their health and safety.</li> </ul>			
	Ensure the health and safety implications of introducing new processes, new working practices or new personnel are clearly understood by those responsible for health and safety management. Provide sufficient resources for the task and seek advice where necessary.	This gives assurance to the board, shareholders and the wider organisation, that measures to ensure effective management of change are in place. Also, it gives assurance the risks associated with implementing change are understood and controlled.		
	Ensure health and safety risks are always assessed when taking decisions.			
<b>Measure</b>	Ensure appropriate weight is given to reporting both preventive information and incident data (including accident and sickness rates) by developing and documenting leading and lagging indicators that include proactive and reactive measures.	This will bring focus and clarity to the decision-making process, and provide a platform to aid the delivery of continuous improvement.		
	Ensure periodic audits (of not less than six months apart) monitor the effectiveness of management structures, and that risk controls for health and safety are carried out.			
	Ensure the impact of changes on health and safety performance – or any major health and safety failure – is reported promptly to the board and shareholders.			
	Ensure effective procedures are in place to implement new and changed legal requirements, and to consider other external developments and events.	This will ensure the organisation is kept up to date, and enable it to adjust its plans to ensure ongoing legal compliance.		
<b>Review</b>	Ensure the board reviews health and safety performance at least quarterly.	The review process should examine whether the health and safety policy reflects the company's current priorities, plans and targets, and whether sufficient funding is in place to deliver the plans and targets.		
		This gives the board a clear indication of how effectively plans are being implemented, and provides the opportunity to hold the senior management team to account. It also indicates if any adjustments to the plan are required.		
	Check the review process to examine whether risk management and other health and safety systems have been effectively reported to the board, and that the board has acted on them appropriately and in accordance with their responsibilities.			

## Appendix 2: Good practice – health and safety leadership

Step	Recommended actions	Current approach	Action required?
<b>Plan</b>	The agenda for board meetings should have a standing item for health and safety first on the agenda.		
	To send a strong signal to the organisation that the issue is taken seriously, and that its strategic importance is essential to the success of the company, the board should identify one director as the health and safety 'champion' with responsibility for oversight of implementing health and safety policy and arrangements.		
	The board should set targets for delivering health and safety improvements across the business.		
	A non-executive director can act as a scrutineer – ensuring the processes to support boards facing significant health and safety risks are robust.		
<b>Execute</b>	Leadership is more effective if visible. Directors must lead by example and should be seen on the 'shop floor', following all safety measures and dealing with any breaches immediately.		
	When selecting new senior managers, give due consideration to their ability and attitude to positively influence the company's health and safety culture and performance.		
	Procurement standards should include the absolute requirement to evaluate potential health and safety risks in order to avoid the introduction of health and safety hazards.		
	Ensure that the health and safety arrangements of partners, key suppliers and contractors are properly assessed, as their performance can have an adverse effect.		
	Set up a separate risk management or health and safety board committee chaired by a director (preferably a non-executive director).		
	Provide health and safety training to all directors.		
<b>Measure</b>	Consider additional worker involvement in health and safety (above the legal duty to consult worker representatives) to improve participation and help prove company commitment.		
	Establish effective monitoring of sickness, absence and workplace health, as this can alert the board to underlying problems that could seriously damage company performance or result in accidents and long-term illness.		
	Ensure workplace health and safety data is benchmarked against other organisations in the same sector.		
	Appraisals of senior managers should include an assessment of their contribution to health and safety performance.		
	Consider whether the board should receive regular reports on the health and safety performance and action of contractors.		
<b>Review</b>	Consider involving workers in monitoring to win greater support for health and safety.		
	Ensure that health and safety performance is increasingly recorded in annual reports.		
	Consider additional visits by directors to the 'shop floor' to gather information for the formal review.		
	Consider celebrating good health and safety performance at both central and local levels.		

## Appendix 3: Questionnaire on health and safety leadership

Question	Response	Action required?
How does your business demonstrate its commitment to effectively managing health and safety?		
Is there a company safety strategy in place, and has the safety strategy for the current year been approved by the board?		
What do you do to ensure appropriate board-level review of health and safety?		
How does the business ensure, at all levels including the board, that it receives competent health and safety advice?		
How do you ensure that all employees – including the board of directors – are sufficiently trained and competent in their health and safety responsibilities?		
How confident are you that your workforce, particularly employee safety representatives, are consulted properly on health and safety matters, and that their concerns are reaching the appropriate level of seniority and being acted upon, including, where necessary, the board of directors?		
What systems are in place to ensure the company's risks, including asset and physical security risks, are understood by senior management? Are the risks being assessed properly by competent people, and have sensible control measures been established and maintained?		
How well does senior management know what is happening on the ground, and what audits or assessments are undertaken to inform the management team about how employees and contractors carry out their day-to-day duties? How are audit findings reviewed and acted upon?		
What regular information does the board and senior management team receive about health and safety (such as performance data and reports on injuries and work-related ill health)? How is this information acted upon?		
What targets has the business set to improve health and safety performance? Does the company benchmark its performance against others in its sector or beyond?		
Where changes in working arrangements have significant implications for health and safety, how are these brought to the attention of the board? How are the changes implemented safely by the senior management team?		
What systems and arrangements are in place to ensure the company has effective stakeholder engagement and grievance management procedures? Are these procedures being fully implemented?		
What does the board do to ensure that the integrity of the assets, including operational control arrangements, are effectively managed and implemented?		
How does the board ensure there are effective community and social health and safety plans and policies in place, and that these plans are being implemented and effectively managed?		

## Appendix 4: Technical due diligence – essential controls to facilitate safe operation of the power network

Ref	Key components	Assessment findings (score)	Recommended corrective actions
1	Technical staff organisation diagram		
2	CV for HSE manager/HSE officer		
3	CVs for technical engineer and technicians		
4	Asset management database/asset register/protection settings database		
5	Technical specifications and codes of practice documents		
6	Power system safety rules and associated operational procedures		
7	System control: centralised or local control of system		
8	System records, system diagrams, substation diagrams, protection diagrams		
9	System naming and labelling policy		
10	System operational locking policy (including LOTO and use of 'danger' and 'caution' notices)		
11	System switching schedules		
12	Training of authorised and competent persons: review/control/QA/course content		
13	Records of training delivered to authorised and competent persons		
14	Policy for the authorisation of persons who access, operate or work on electrical power systems		
15	Policy for the issue of operational keys, safety rules and certificates of competence		
16	Assessment of competent, authorised and senior authorised persons		
17	Roles and responsibilities of competent, authorised and senior authorised persons		
18	System operational audits		
19	Operational refresher training		
20	Control engineer training		
21	System temporary running conditions		

### Assessment findings: Scoring criteria

Scoring	Criteria
0	Nil return/not available
1	Poor standard – improvement essential
2	Mediocre standard – improvements required
3	Meets standard

## Appendix 5: Safe management of contracts – essential components

Ref	Key components	Assessment findings (score)	Recommended corrective actions
1	Health and safety-specific contractual obligations		
2	Accident investigation procedures		
3	Accident investigation reports		
4	Evidence of investigation reports and implementation of recommendations		
5	Incident/accident/near-miss reporting system		
6	Training content (formal and on-the-job)		
7	Records of training		
8	Competence assessment criteria		
9	Competence assessment records (including certificates)		
10	Safety rules relating to working at height, conductor tensioning, etc.		
11	Risk assessments (general/task-specific/site-specific)		
12	Method statements		
13	PPE specification		
14	Tools and equipment specifications		
15	Project management organisational structure		
16	Site supervision arrangements		
17	Contractor/client policy and arrangements for the management of health and safety		
18	Health and safety audit procedure (system and site)		
19	Health and safety audit reports (system and site)		

### Assessment findings: Scoring criteria

Scoring	Criteria
0	Nil return/not available
1	Poor standard – improvement essential
2	Mediocre standard – improvements required
3	Meets standard

## Appendix 6: Asset condition – critical mitigation measures checklist

Ref	Key components	Assessment findings (score)	Recommended corrective actions
1	Is there a community and school safety programme that involves all staff, and is it mindful of local language and uses platforms (such as radio) easily accessed by the local population?		
2	Are there adequate warning signs on poles, electrical equipment and community centres?		
3	Is there a process whereby networks can be isolated in less than 30 mins, or as quickly as is practicable?		
4	Have priorities been set for each high-voltage feeder focused on locations where the public are most at risk, and have mitigation measures been identified?		
5	Is there a toll-free or reduced-cost call tariff set up for the public to make emergency calls to support the safety engagement programme?		
6	Do all staff understand that isolation to make the network safe is more important than keeping the lights on?		
7	Are most hazardous locations isolated before storm conditions and inspected before power is restored?		
8	When 'proactive' isolation occurs, does the company implement radio announcements giving the reason at the time of isolation?		
9	Is there agreement with the regulator that in the event of emergency isolation the measurements for power interruption – System Average Interruption Duration Index (SAIDI), Customer Average Interruption Frequency Index (CAIFI) – are not applicable? If not, has the HSES committee approved this action?		
10	Do all technicians have the appropriate safety and operating equipment to undertake isolations at any time?		
11	Are all points of isolation operational and the location known to technicians and operatives?		
12	Are poles and conductors inspected on a regular basis (at least annually)?		
13	Where poles are identified as red, in high-risk areas are they identified for replacement or additional mechanical support?		
14	Have all staff been trained to identify basic network faults (leaning poles, sagging conductors)? Do all staff know when a leaning pole or sagging conductor is dangerous and to report it through the toll-free number?		
15	Is the call centre interfaced with the works management centre, so that the timeliness and quality of response is monitored and logged?		
16	Does the company have customer call-back procedures so that customers are contacted after they have made an emergency call informing of the actions taken?		
17	Have company staff been selected and trained to undertake public safety talks?		
18	Has the strategy for prioritising risk mitigation been informed by the local management responsible for their safe operation?		

### Assessment findings: Scoring criteria

Scoring	Criteria
0	Nil return/not available
1	Poor standard – improvement essential
2	Mediocre standard – improvements required
3	Meets standard

## Appendix 7: HSES Committee Terms of Reference

### Notes:

- This TEMPLATE Terms of Reference (ToR) has been drafted for a Health, Safety, Environmental and Social (HSES) committee to a board. The company may amend the name of the committee, for example, to Environmental, Social and Governance (ESG) committee or other, as appropriate.
- It has been drafted to include business integrity issues. The company may wish for business integrity to be addressed by the audit committee. If so, the ToRs should be amended accordingly. Noting the links that may be apparent between business integrity issues and Occupational Health and Safety (OHS)/Community Health, Safety and Security (CHSS) consequences, it may be important to find a way in which business integrity and OHS/CHSS concerns can be considered together.
- Security is not included within the scope of this ToR, as it can be a sensitive topic and better addressed by specialists in another forum.
- As appropriate, a company may wish to establish a specific health and safety sub-committee with a focus on accident investigation that reports into the HSES committee.
- These ToRs can be adapted for use by a management committee. Key amendments will be required to address, inter-alia: membership, delegated authority, reporting and review and assessment.

### TERMS OF REFERENCE OF THE ENVIRONMENTAL, SOCIAL AND GOVERNANCE COMMITTEE OF THE BOARD

The Environmental, Social and Governance Committee (the “**Committee**”) is a committee of the Board of Directors (the “**Board**”) of [COMPANY] (the “**Company**”). [The Committee shall have oversight of all the companies in the [NAME] group (together the “**Group**”).

#### (1) NAME

Health, Safety, Environmental and Social (‘HSES’) Committee.

#### (2) PURPOSE

The purpose of the Committee is to ensure that the Group adopts and implements HSES [and Business Integrity (‘BI’)] practices in accordance with [INSERT RELEVANT INTERNATIONAL AND SHAREHOLDER REQUIREMENTS], all local legal and regulatory requirements and any Environmental, Social and Governance Action Plan agreed with the Company.

#### (3) MEMBERSHIP

(a) The Committee will be appointed by the Board from Directors of the Company.

(b) The Committee will consist of [insert number, minimum 03] members, such members being:

- [COMPANY] Board Representative(s)
- [SHAREHOLDER] Board Representative(s)

(c) The Chair of the Committee shall be appointed by the Board.

#### (4) QUORUM

A meeting will be quorate when all [insert number, minimum 03] members are present.

All members of the Committee may participate in a meeting of the Committee by means of a conference telephone or any communication equipment. A member of the Committee so participating shall be deemed to be present in person at the meeting and shall be entitled to fully participate and be counted in the quorum accordingly.

#### (5) SECRETARY

The secretary of the Committee shall be the Board’s Company Secretary (“**Secretary**”).

#### (6) VOTING

Decisions shall be made by a majority of those voting.

## **(7) RESOLUTIONS IN WRITING**

A resolution in writing signed by all the Members entitled to receive notice of a meeting shall be as valid and effectual as if it had been passed at a meeting of the Committee duly convened.

## **(8) FREQUENCY AND NOTICE OF MEETINGS**

(a) Meetings shall be held as required, but not less than four each year to coincide with Board meetings.

(b) Notice of meetings shall be given by the Secretary at the request of the Committee Chair or any of its Members to all Members, [the Group Managing Director, the Group Head of EHS, the Group Head of HR, the Chief Financial Officer and the Managing Director] (as appropriate) no later than [10] working days before the date of the meeting.

## **(9) ATTENDANCE AT MEETINGS OF THE COMMITTEE**

(a) Only Members and the Secretary shall be *entitled* to attend meetings of the Committee.

(b) The Committee may request any member of management or staff to attend meetings of the Committee in order to carry out its responsibilities.

(c) The Committee may co-opt individuals who are not directors but who possess the experience and qualifications relevant to the functions of the Committee, such as representatives of [SHAREHOLDER] ESG and BI teams. These individuals shall not be entitled to vote on matters before the Committee.

(d) The Committee may also engage and compensate, at the Group's expense, external technical experts to secure attendance at committee meetings to provide advice and guidance from time to time, if it considers this necessary.

## **(10) AUTHORITY**

The Committee is authorised by the Board:

(a) To seek any information (data, reports and other relevant information on HSES and BI matters) it requires from any employee of the Company in order to perform its duties;

(b) To have full access to the books of account and other papers and records of the Company, and to visit any Company premises and to talk to any member of the executive team or member of staff, as it considers necessary to perform its duties;

(c) To investigate or oversee any Company investigation relating to breaches of HSES and BI laws, regulations and standards and/or the Company's HSES policies, management systems and plans;

(d) To secure the attendance of external advisors at its meetings, if it considers this necessary, at the Company's expense; and

(e) To commission any reports or surveys, at the Company's expense, which it deems necessary in relation to its duties.

The Board shall ensure that the Committee has adequate resources and authority to discharge its responsibilities.

## **(11) DUTIES**

The Committee should carry out the duties set out below for the Company [and any major subsidiary undertakings], as appropriate:

(a) Provide strategic advice and guidance to the Board in relation to systemic and strategic HSES and BI issues which affect the Company's business model and strategy.

(b) Monitor the implementation of the Environmental and Social Action Plan, the Business Integrity Action Plan and any other corrective action plans that may be developed in due course to ensure the adequate implementation and continuous improvement of robust systems for monitoring HSES and BI matters and performance of the Company in accordance with applicable legislation and Good International Industry Practice (GIIP).

(c) Assist the management team with general and, if requested, specific guidance on the interpretation of HSES and BI principles, particularly in respect to health and safety, environmental and community issues.

(d) Advise the management team on the appointment, removal and/or replacement of senior personnel responsible for the implementation, operation and maintenance of the HSES management systems and plans, and Compliance programme of the Company.

(e) Review the Company's Compliance programme in accordance with legal, regulatory and contractual provisions, as applicable.

(f) Review BI policies and initiatives.

(g) Oversee investigations into matters within its scope, such as matters relating to employee fraud, misconduct or conflicts of interest.

(h) Provide recommendations or highlight red flags for potential assets being considered by the company for acquisition.

(i) In terms of ethics, the Committee shall also monitor the implementation of the Company's Code of Conduct as it relates to the implementation of HSES and BI policies, management systems and plans. The Committee will:

- consider reports on breaches of ethical conduct and escalate to the Board for consideration as required.
- monitor the ethical conduct of the Company, its executives and senior officials.
- review/develop relevant ethical standards.
- monitor compliance with regulations, codes of practice as defined in transaction documents, etc.

(j) Work and liaise as necessary with [insert other relevant committees] committee, ensuring the interaction between committees and with the Board is reviewed regularly.

## **(12) CONFIDENTIALITY OF COMMITTEE INFORMATION**

All information received by the Committee is confidential and is the property of the Group and cannot be disclosed to parties outside of the organisation without prior approval of the Board.

## **(13) REPORTING**

(a) The Secretary shall minute the proceedings and resolutions of all Committee meetings, including the names of those present and in attendance and the details of any conflicts of interests declared.

(b) The Secretary shall circulate copies of the minutes of meetings of the Committee to all Directors, following the preliminary approval of such minutes by the Chair no later than [7] business days after the Committee meeting; formal approval of such minutes shall be sought at the next meeting of the Committee.

(c) The Chair may report on decisions of, or matters coming before, the Committee to any other person or body the Committee considers appropriate.

(d) The Chair shall be required to attend the Company's Annual General Meeting (AGM) to respond to shareholders' questions about the Company's HSES and BI practices.

(e) The Company will provide a report on its HSES and BI performance to HSES members and observers no later than 7 days prior to the scheduled meeting. The format will be agreed and approved by the HSES Chair.

These Terms of Reference were adopted by the Board of Directors of the Company on [Date].

Signed: .....

**Chairman of the Company**

## Appendix 8: Additional guidance relating to pole management strategies

### Problem

Rotten or poorly installed poles are a significant cause of accidents to workers and to the public. Typically, these occur when there is no effective pole installation strategy:

- Poles fall or lean to such an angle that live conductors come into reach of normal human activity (for example, digging with hand tools, passing under conductors with loaded vehicles, falling across pedestrian routes or onto metallic roofs).
- If poles are not installed to the correct depth, or without the required foundations or compaction, they may appear to be 'sound' and assessed as being in good condition during pre-climb checks, but risk falling when a technician ascends.
- Rotten poles may be climbed because incorrect assumptions are made (such as having been recently installed or pole treatment assumed to be effective).
- Poles can fall directly onto vehicles or pedestrians during poor weather or during work activities – such as when tension is removed from a pole during replacement of conductors.

### Mitigating actions

#### Climbing

- Strict appliance of pre-climb checks, including sounding, and visual inspection that look for signs of infestation (such as termites or bees) and signs of rotting. Rotting is usually observed at ground level, and easily identified by probing with a sharp instrument just below and above ground level.
- Never climb a leaning pole.
- Develop and implement a hierarchy of controls for climbing, such as using mechanical means before the use of climbers and harness.
- Where rotten poles are detected, and there is no mechanical access available, install the new pole first and strap the rotten pole to it before climbing.
- Introduce an inspection and test plan to ensure poles are installed in accordance with the approved specification. All poles should be marked with date of pole installation and by whom.

#### Wood pole stability

- In addition to annual inspections, more routine 'drive-through' inspections can be undertaken when networks identified for refurbishment remain in a hazardous state. This is particularly important after adverse weather. If networks are particularly poor, consider pre-isolation of power and inform the public using normal methods, explaining the reason why power is isolated. This emergency process will need to be agreed with the regulator as an appropriate strategy during specific circumstances.
- If networks have suffered from significant underinvestment, consider stabilising poles by using bracing supports that bridge the rotten section and are installed to the same depth as the pole. Wooden poles usually deteriorate between the areas 15cm below ground level to 5cm above. This is a mitigation measure only, but can be effective in the short term.
- Implement an inspection and test plan for wooden pole treatment which traces a pole from the date and location of it being forested, to treatment plant and type of chemicals used.
- Consider using a non-verbal categorisation for pole condition (for example: green = 'good'; amber = 'OK until next inspection'; and red = 'urgent replacement').
- Similarly, implement an inspection and test plan for pole installation that details each pole's unique number, the installer (contractor), the date installed, and the supervisor certifying pole installed to specification. Poles should be marked with this information.
- Do not use concrete around bases of wooden poles to improve stability or lifespan, as this worsens the conditions for causing rot.
- Protective sleeves (such as those made from bitumen adhered to a thermoplastic membrane) can increase wooden pole life. Ensure only those with certified standards and history of use in similar environments are considered.
- Ensure all replaced rotten poles are disposed of in accordance with environmental regulations, and always cut into small sections (such as fence post length). This prevents rotten poles being used in other parts of the network, or in the construction of illegal networks.

## Wood pole alternatives

In emerging economies, wooden poles are still most commonly used in the construction of overhead networks. However, long-term strategies should consider alternatives such as concrete, metal and plastic. Usually, the approach would be to introduce a combination based on risk. However, just because a material may seem obviously beneficial, the following considerations are advised:

- All alternatives are subject to catastrophic failure if quality assurance processes are not in place. So, are the independent competencies for approving quality available?
- Identify what materials are available and suitable for your environments, and determine lead-in and delivery times.
- A change in specification will need approval from a regulator – early conversations and joint visits to networks using the proposed material can be helpful.
- Is the infrastructure, roads and plant available to facilitate a change?
- To ensure the network is stabilised as soon as practicable, is a mixed material approach preferable (for example, concrete poles with concrete foundations in swamps and higher population density areas, and wood elsewhere)?
- What will be the impact on access and maintenance processes with the new pole material? Pole installation, stringing of conductors, training, risk of material theft (such as for lattice metallic poles). Will the new material make it easier or harder for illegal activity to be carried out?

Pole strategies will tend to be a combination of approaches, as the investor tends to apply both short-term and long-term considerations.



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