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THE POWER INSTITUTE FOR EAST & SOUTHERN AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT GUIDELINES –

Part 1: Distribution Powerlines

Preferred requirements for applications in the Electricity Supply Industry in East and Southern Africa

This Guideline is issued by PIESA Environmental Management Working Group
on behalf of the
User Group given in the Foreword
And is not a standard as contemplated in the **Standards Act, 1993 (Act 29 of 1993).**

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FOREWORD

The Power Institute for East and Southern Africa (PIESA) is a regional power utility association established in 1998 to co-ordinate information, technology and resource sharing in the specialized areas of:

1. technology and engineering support;

2. applied research;

3. standardization;

4. incident investigations and technical audit; and

5. technical resource development and training.

6. environment

The PIESA primarily aims to develop technological capacity in the region's distribution network by promoting a spirit of resource sharing. Membership of the PIESA is open to national electric power utilities in East and Southern Africa that wish to participate in the sustainable development of power systems in these areas.

This document was prepared on behalf of the Environmental Working Group of the PIESA, by the task team listed below and approved by the Board of the PIESA for use by supply authorities in the East and Southern African region.

At the time of approval the working group comprised the following members:

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Annex A is informative only.

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DEFINITIONS

Environment - means the surroundings within which humans exist and that are made up of--

i) the land, water and atmosphere of the earth;
ii) micro-organisms, plant and animal life;
iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and
iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being;

Environmental Management Plan (EMP): A plan that seeks to achieve a required end state of the environment and describes how activities, that could have a negative impact, will be managed and monitored and how impacted areas will be rehabilitated.

National (legislation): relating to or belonging to a nation or country

Screening: an assessment of a project systematically in order to determine whether there is a likelihood of significant impacts that require further investigation or whether a decision can be made, based on the information provided as a result of the screening process;

Scoping: the process of identifying issues related to and/or alternatives to the proposed development;

Wayleave/servitude: a swath of land or area of land appropriately cleared of vegetation under a distribution power line or any such electrical infrastructure.

ABBREVIATIONS

EIA – Environmental Impact assessment

EMP – Environmental Management Plan

EA – Environmental Assessment

I&AP – Interested and Affected Parties

EMF – electromagnetic fields

ROD - Record of Decision

1. INTRODUCTION

1.1. POTENTIAL ENVIRONMENTAL IMPACTS

This guideline was prepared to establish and promote uniform requirements for the undertaking of environmental impact assessments for distribution power lines.

The PIESA Board expresses the wish that, in the common interest of electricity utilities in the East and Southern African region, this guideline be used to ensure environmental issues are considered in decision-making processes in distribution network planning, construction, operation and maintenance.

Electric power lines will impact on natural and socio-cultural resources. These impacts may be localised for short power lines, or regional for long power lines. The environmental impacts are related to the significance of the receiving environment and could increase with increasing line length. They will occur primarily within or in the immediate vicinity of the wayleave/servitude. For higher voltage lines, larger supporting structures and wayleave/servitudes will be required. This will increase the magnitude and significance of the construction and operational impacts.

The negative environmental impacts of power lines will be from vegetation clearance from sites and wayleave/servitudes, construction of access roads, tower pads, and substations during the construction phase. Construction in the wayleave/servitude can also result in the loss and fragmentation of habitat and vegetation along the wayleave/servitude. The operation and maintenance impacts are from chemical or mechanical control of vegetation in the wayleave/servitude and occasional line repair and maintenance. The physical presence of the line itself can also be a source of environmental impact from its visual effect and impacts of avian (bird) collisions. (World Bank, 1991). A critical function in reducing impacts is the line and tower design. This should ensure those issues such as tower spacing, topography, aesthetics, avian and other wildlife related impacts are minimised.

The first system of Environmental Impact Assessment (EIA) was established in the USA in 1970. Since then, EIAs have been used as a powerful planning tool throughout the world and they are also a good safeguard against environmental degradation (Therivel, 1995). The aim of this document is to help disseminate information about how EIAs should be undertaken for distribution power lines by PIESA member utilities. In general, these guidelines are applicable to the construction, erection or upgrading of infrastructure for bulk supply. Bulk supply should be regarded as power lines and substations capable of operating at a nominal voltage level above 33kV.

The environment can be defined as the natural and social conditions surrounding all mankind, for current and future generations (World Bank, 1991). The EIA is a process for evaluating the potential positive and negative impacts on biophysical, socio-economic and cultural environment and recommending mitigation measures to manage identified impacts.

The purpose of this document is to provide guidance to the environmental officers or practitioners about the requirements for undertaking an EIA for a distribution power line. These include what should be considered when undertaking an EIA and the EIA process including among other things; screening, scoping, site selection; stakeholder involvement, legal review, consideration of alternatives, impact analysis and mitigation measures. It should be noted that this document is a guideline and practitioners undertaking EIAs must take into consideration the legal requirements of the country where the development is performed.

The distribution of electricity includes the construction, operation and maintenance of power lines, the associated infrastructure and their wayleaves/servitudes, access roads. The size and structure of the towers depends on the voltage, on the design parameters of the line and the line capacity.

The different types of towers include, amongst others:

a) Single wood pole structures for small lines up to 33 kilovolts (kV);

b) H-frame wood pole structures for lines between 66 to 132kV; and

c) Self-supporting steel structures.

d) Distribution lines vary in length from a few kilometres to hundreds of kilometres. The wayleaves/servitudes can be between 10-32 metres wide or greater depending upon the size and the number of lines in the wayleaves/servitudes. It may be linked to a building restriction width and can also vary between countries. They are mainly overland systems, which span or cross wetlands, streams, rivers, and near-shore areas of lakes, bays, hills and valleys, etc. Underground lines (cables) are technically feasible but expensive.

   Proper management of wayleave/servitude can be beneficial to wildlife as cleared areas can provide feeding and nesting sites for birds and mammals. Further, the "edge' effect will result in increased habitat diversity at the contact between the wayleave/servitude and the existing vegetation. Power lines and associated structures can serve as nesting sites and perches for many birds, especially raptors (World Bank, 1991). However, powerlines can increase the mortality of bird species from collisions with the lines and electrocutions at the structures (Hemming, 1999).

   The greatest impact of electric power lines is on land resources, as a wayleave/servitude is required. Grazing and other agricultural uses are usually not precluded in wayleave/servitude, but other uses are generally not compatible. If free access is not allowed, wayleave/servitudes can interfere with, or fragment existing land uses along the wayleave/servitude irrespective of their width. The longer the power line, the more areas will be affected and the more likelihood of significant impacts on facilities such as wetlands or wildlands (World Bank, 1991).

   However, in remote areas, distribution lines can result in more lands being opened up to human activities including settlement, agriculture, hunting, recreation, etc. (World Bank, 1991). This can also lead to illegal activities such as poaching and logging.

   PIESA is thus committed to sound environmental management and one of the initiatives to demonstrate this is the drafting of EIA guidelines for distribution power lines. These guidelines are detailed below and are based, largely, on the World Bank Guidelines for Environmental Assessment of Energy and Industry Projects.

2. POWER INSTITUTE OF EAST AND SOUTHERN AFRICA (PIESA) ENVIRONMENTAL POLICY

Electricity plays an important role in contributing to economic development – a positive impact. However, it may have negative impacts on the environment. It is essential that mitigation measures are developed to avoid, or alternatively, minimise these impacts. One of the ways of addressing this is by adopting or formulating an environmental policy. PIESA as an organisation has an environmental policy, which commits it to:

a) Continual improvement in environmental performance;

b) Compliance with the relevant legislation and regulations and with other requirements to which the organisation subscribes; and

c) The creation and promotion of environmental awareness and training within and outside PIESA.

3. PRINCIPLES OF ENVIRONMENTAL IMPACT ASSESSMENT

3.1. Environmental Impact Assessment (EIA)

EIA is the process of identifying, evaluating and mitigating all the relevant effects of development proposals including biophysical, social and others. It is an investigation and evaluation of the impacts of activities on the natural environment, socio-economic conditions and cultural heritage. This should be done before the project activity is implemented and reported to the designated competent authority for authorisation. The EIA must include public participation and the investigation of mitigation measures that will minimise any impacts on the environment, associated with the activity, including the consideration of not implementing the project.

- According to the World Bank Environmental Assessment sourcebook, the key objective in undertaking Environmental Assessments (EAs) is to implement an effective EA process and produce a useful report. Key technical and managerial challenges to implementing an effective EA process include:
    - Selection of an appropriate EA team, in terms of technical and managerial capabilities;
    - Collection, evaluating and presenting relevant environmental information for use in project planning and decision making;
    - EA requires a variety of specialist inputs depending on the potential impacts to be addressed. Each EA team needs an effective manager, experienced and familiar with handling the impacts to be analysed.
    - Impact identification is a continuous process during screening and scoping and continues through impact prediction as new information becomes available.

3.2 Objectives of EIA

Some of the objectives of the EIA are to:

a) ensure that environmental considerations are explicitly addressed and incorporated into the decision-making process throughout the project life-cycle;

b) ensure that all adverse biophysical, social and other relevant effects of the development proposals are anticipated and avoided and the impacts are minimised or offset;

c) ensure the ecological processes of natural systems are protected to maintain their productivity and capacity; and

d) ensure that financial resources are incorporated for mitigation measures, environmental management plans and auditing.

e) promote sustainable development and optimise resource use.

f) enhance positive impacts

3.3 Plans and Operating Principles

The EIA process is required:

a) From the earliest possible time, during the feasibility and planning stages of the project life-cycle to influence the decision-making process and continuing throughout the life cycle of the proposed activity;

b) For all development proposals, the scope will be determined by the potential significance and extent of the impacts;

c) To include relevant socio-economic factors, health, culture, gender, lifestyle, age and cumulative effects on communities and biophysical impacts. Consistency with the concept and principles of sustainable development must be maintained;

d) To provide involvement and input of all stakeholders including communities and industries affected by a proposal, as well as the interested and affected parties (I&APs); and

e) To adhere to International Conventions, protocols, national legislation and related policies.

It is essential that the proponent of a project is fully aware of the legislation applicable to the environment in the country of the project. It is also essential that in the case of projects crossing international boundaries, the legislation applicable in both countries is fully understood and adhered to. In many developing countries, the World Bank Source Book on environmental issues provides invaluable guidance. However, it cannot identify the legislation applicable in the affected countries, nor does it provide full information on the types of legislation which may be applicable to the environment.

4 IMPORTANCE OF THE EIA PROCESS FOR PIESA MEMBERS

Several important internationally-accepted principles have contributed to the recent rapid growth of EIAs; the most important being the principle of sustainable development promoted by the World Commission on Environment and Development in its report of 1987 (Therivel, 1995) and at the United Nations Conference on Environment and Development (1992) that human activities must adapt to nature's carrying capacity.

Some of the internationally accepted principles guiding environmental management are as follows:

a) Preventative action is better that remedial measures;

b) The source of environmental damage should be minimized;

c) The polluter pays principle (PPP) should be implemented;

d) Environmental policies should be an important component of the company's/organisation's policies relating to development issues and the company's/organisation's business;

e) Development must be socially, environmentally and economically sustainable; and

f) The socio-economic and environmental impacts of activities, including disadvantages and benefits, must be addressed.

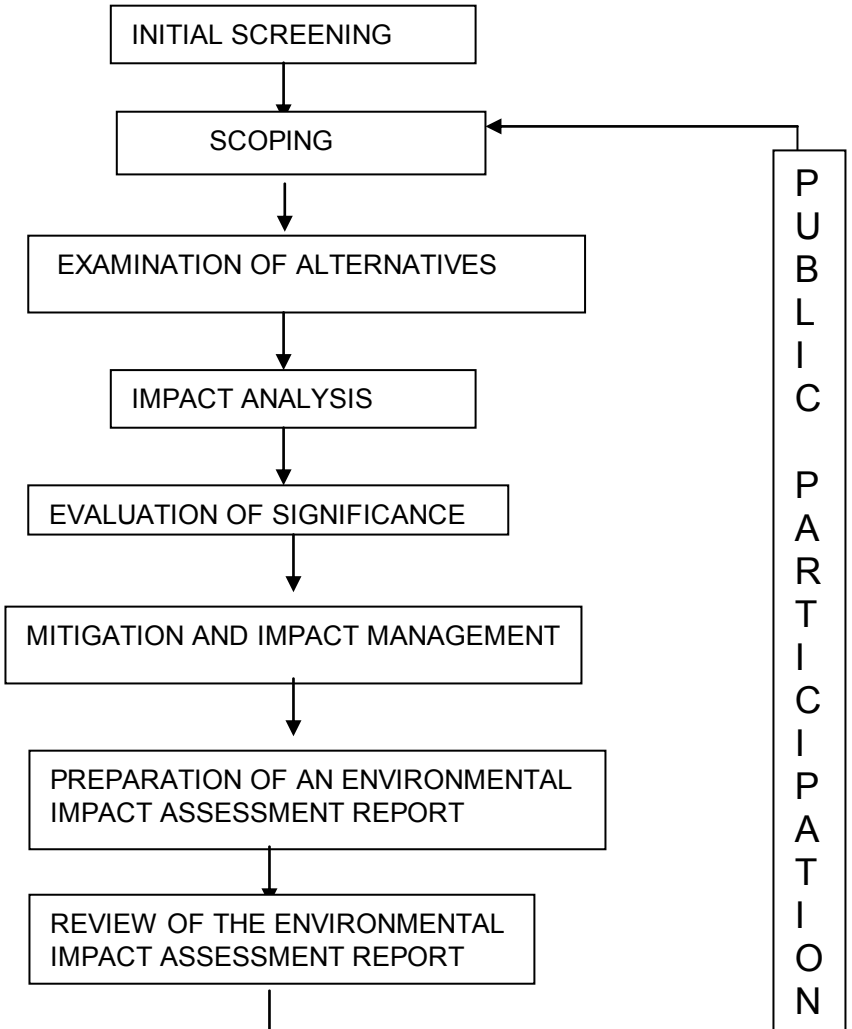
5 ENVIRONMENTAL LEGISLATION

A wide variety of legislation, including government policies may be applicable to a project and will need to be reviewed, depending on specific national circumstances.

Every EIA should include review of environmental legal framework, environmental legislation and policies of individual PIESA countries as well as international conventions and protocols.

6 THE EIA PROCESS

Figure 1. A generic EIA process *(World Bank).*



6.1 PROJECT PLANNING

Once the need for the project has been identified, the first step with regard to project planning is the selection and organisation of a project team. Each member of the team will be tasked to play a certain role or roles in the project. The project team will comprise a project leader, who will co-ordinate the project, together with experts in various fields, for example, physical, biological, socio-economic, and cultural backgrounds. Specialists may be appointed when required to undertake specialist studies on certain issues, as determined by the project leader or required by the authorities. The size of the project team will be dictated by the complexity of the proposed project. Table 1, shows some of the issues that may require specialist input.

The initial planning, which can be referred to as a feasibility study, can be done in-house. During this stage the technical options, project feasibility or return on investment (ROI), is determined. Hence, the only stakeholders involved are the proponent and maybe the customer for new supplies. However, external input on a macro level (such as little or no development areas, highly sensitive areas that will definitely influence the route or site selection etc.) is needed during this stage.

A project brief/justification will be required defining the need of the project e.g. increase in load, system strengthening, customer request for new supply etc, background information on the technical nature of the project proposal and a brief description of the affected environment.

Stakeholders and interested and affected parties' involvement are an important part of the EIA process. Therefore, they must be identified at an early stage so that valuable input can be sought from them ensuring the process is open, participatory and transparent.

The stakeholders not identified for the initial planning stage normally provide input during the scoping phase unless the macro evaluation referred to above shows significant issues which must be addressed during the feasibility study.

6.1.1 Screening

At this stage an initial screening process is recommended for which an initial project brief should be prepared. Screening is an activity, which has been developed for use in the EIA process, and is implemented in numerous countries. The basic concern initially is the potential applicability of the EIA requirements.

Screening is the process of deciding the issue of whether or not an environmental impact study would be required for the potential action (Canter, 1996). It should be done internally, prior to consultation with the relevant authority. Hence the screening can be performed as part of the feasibility study to identify macro-environmental issues, as mentioned above. However, if there is any doubt as to the need for an EIA, consultation with the authorities may be advisable in order to confirm whether an EIA is required or not and what level of detail will be necessary.

6.1.1.1 Pre-Application Consultation

A pre-application consultation meeting should be arranged with the relevant authority to initiate the project and give a full project description to the authority. Such a meeting is important, as it will enable the project team to get additional information from the authority on the issues that will be considered and/or addressed during the scoping phase

6.1. 2 Scoping Process

Scoping is primarily focussed on the identification of issues and determining the significance of specific issues and impacts which may need to be addressed in a comprehensive environmental impact study (Canter, 1996). A plan of study for the scoping report, should be developed to guide and focus the scoping process. If required by national or local legislation, the plan of study, together with an application for authorisation form should be submitted to the relevant authority so that the project could be registered and formal approval can be given to proceed with the scoping process.

The plan of study for scoping should consist of the following:

a) Description of the activity;

b) A schedule of activities and description of tasks to be performed during the scoping;

c) Time-table of tasks;

d) Authority consultation; and

e) Method of identifying issues and alternatives.

The issues that should, as a minimum, be included in the completed scoping report are:

a) Brief project description;

b) Brief description of how the environment may be affected;

c) Description of environmental issues identified and their environmental significance;

d) Description of all alternatives identified;

e) Description of the public participation process; and

f) Findings of the scoping and whether further detailed studies are required.

6.2 ASSESSMENT OF IMPACTS

In instances where the project is of such a magnitude that a decision cannot be made at the scoping report stage, the consultant/proponent will be required to proceed further with the EIA process. The next stage after the scoping report is the production of Terms of Reference and a plan of study for an environmental impact assessment, which will automatically lead to the environmental assessment report. This study should address the following phases of the project;

a) Pre-construction phase.

b) Construction phase.

c) Operational and maintenance phase.

d) Decommissioning phase.

The contents of the plan of study for EIA are as follows:

a) Executive summary presenting brief comprehensive summary of impacts, mitigation measures and expected benefits of the project.

- Contents page
- Introduction covering type of project, its background, location, size, project proponent, project time frame, EIA team
- Terms of Reference
- Study Methodology.
- Assumptions and limitations
- Administrative, legal and policy requirements.
- Project proposal/description.

Baseline Data: the affected environment covering location, boundaries, biophysical, socio-economic, cultural and historic and affected and interested parties, including specialist studies (see Table 1 below).

- Methodology
- Assessment: prediction of impacts, evaluation of impacts, evaluation of alternatives
- Recommendations and conclusions

- Production of Environmental Management Plan
- Definition of technical terms and acronyms
- List of compilers
- Acknowledgement
- References.
- Personal Communications
- Appendices

A systematic and rigorous approach to identifying impacts can be based on the following methods:

- Checklists
- Interaction matrices
- Networks
- Overlaying mapping and GIS
- Each method has advantages, drawbacks and potential application in EA tasks.
- Impact Prediction
  - Prediction of impacts is a complex activity and the following techniques may be used to quantify the nature and extent of environmental changes:
    - Mathematical models
    - Physical models
    - Field experiments
    - Structured or semi-structured approaches to produce a mix of qualitative and quantitative predictions
    - Scientific experience and judgement.

- Impact prediction must not only concern itself with estimating the magnitude or scale of change but also provide information on the following aspects of impacts:
  - Duration
  - Likelihood or probability of occurrence
  - Reversibility
  - Area affected

- ♦ Number of people likely to be affected
- ♦ Transboundary aspects.
- ♦ There is an issue of determining distribution of impacts.
- ♦ Baseline studies

– Where there is lack of information, EA teams have to revert to gathering baseline data before proceeding to the stage of impact prediction. The best approach to baseline studies is to use the impacts identified in scoping to guide data collection. In baseline studies the relevance of the data is much more important than amount. Those implementing EAs have a responsibility to ensure that they exercise best professional judgement as to minimum data needed to describe the environment and make defensible predictions. Alternatively data gaps should be identified and evaluated in the report.

- A description of each feasible alternative;
- Assessment of impacts, which should include:
  - Nature of the impact: This is an appraisal of the type of effect the activity would have on the affected environment. This description should include what is being affected and how it is being affected.
  - Extent: Here it should be indicated whether the impact will be local extending only as far as the activity, will be limited to the site and its immediate surroundings, will have an impact on the region or will have an impact on a national scale or across international borders.
- Duration, which may vary from:
  - Short term (e.g. 0-5 years);
  - Medium term (e.g. 5-15 years)
  - Long term where the impact will cease after the operational life of the activity, either because of natural processes or human intervention; or permanent where mitigation either by natural process or by human intervention will not occur in such a time span that the impact can be considered transient.
  - permanent where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
- Intensity: Here it should be established whether the impact is destructive or benign and should be indicated as:
  - low, where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected;
  - medium, where the affected environment is altered by natural, cultural and social functions and processes continue albeit in a modified way; and

  - high, where natural, cultural or social functions or processes are altered to the extent that it will temporarily or permanently cease.

- Probability: This should describe the likelihood of the impact actually occurring indicated as:

  - improbable, where the possibility of the impact to materialise is very low either because of design or historic experience;

  - probable, where there is a distinct possibility that the impact will occur;

  - highly probable, where it is most likely that the impact will occur; or

  - definite, where the impact will occur regardless of any prevention measures.

As much detailed information as possible should be provided, to enable the authorities to make a sensible decision. Based on the current practices, authorisation to proceed is made for most EIA studies at scoping report level. It is only in cases where the environmental impacts of the project are significant that the project may be required to go through the entire EIA process.

The decision making process will culminate in the issuing of a final environmental authorisation (e.g. permit, licence, certificate. etc.) record of decision (ROD) approving or rejecting the proposal. In both instances, conditions will be given to support the ROD, which must be made available to the public and/or I&APs. The applicant and/or proponent and/or all other parties to the process, (public, stakeholders, I&APs, etc) will be granted the right to appeal the decision. When the project is approved an environmental management plan would be required as one of the conditions.

Table 1. Specialists related to Environmental Impact Assessment (World Bank, 1991)

Natural	Sub-component	Specialist
Air	Air quality	Air quality / pollution analyst
	Wind direction/speed	Air pollution control engineer
	Precipitation/humidity	Meteorologist
	Temperature	Noise expert
	Noise	
Land	Land capability	Agronomist
	Soil resources / structure	Soils engineer
	Mineral resources / structure	Soils scientist
	Tectonic activity	Civil engineer

	Unique features	Geologist Geotechnical engineer Mineralogist Mining engineer Engineering geologist Seismologist
Water	Surface waters Groundwater regime Hydrologic balance Drainage / channel pattern Flooding Sedimentation	Hydrologist Water pollution control engineer Water quality / pollution analyst Marine biologist / engineer chemist Civil / sanitary engineer Hydro geologist
Flora and Fauna	Environmentally sensitive areas: Wetlands; marshes; wildlands; grasslands, etc. Species inventory Productivity Biogeochemical/nutrient cycling	Ecologist Forester Wildlife biologist Botanist Zoologist Conservationist
Human	Social infrastructure / institutions Cultural characteristics Physiological and psychological well-being Economic resources	Social anthropologist Sociologist Archaeologist Architect Social planner Geographer Demographer Urban planner

		Transportation planner Economist

7 PUBLIC PARTICIPATION

Public participation is generally a legal requirement in a country where EIAs are legislated. In any development process or proposal, where there are stakeholders and I&APs, they must be consulted/engaged and given an opportunity to participate in the project planning phase. The success of the program of public consultation depends on having clear, well defined goals that are understood by all major players. It is critical to determine which institutions will be responsible for overseeing implementation of the consultation plan and which will be responsible for monitoring and evaluation. It is possible for the developer to use independent facilitators for the public participation process.
Each stage of EIA cycle may require a different approach to consultation, supported by the appropriate level of detail and involving a distinct group of stakeholders. This process includes but is not limited to:

a) Information transfer. (slides /films /photos)

b) Request for information. (Press and open house)

c) Comments and reviews.

d) Questions and answers.

Public participation must be part of the planning or scoping phase of a proposed project and should commence as early as possible. It ensures that:

a) The public is informed of development projects and its impacts (both positive and negative)

b) Issues of public concern are raised and considered in the project plan;

c) Possible alternatives are identified by the public;

d) The level of public support for the proposed project is determined, and

e) Probable conflicts are identified at an early stage and may be minimised.

In order to ensure effective public participation, a detailed programme must be developed.

7.1 PUBLIC PARTICIPATION PROGRAMME

7.1.1 Public Identification

One of the first steps in designing a public participation programme is to identify who “the public” is for the specific project. The public includes:

a) Affected parties - Those who live near a facility, who could be affected by noise, dust, population intrusion, relocation, health and safety risks or other risks, or those who do not live near but whose business or activities/interests may be affected.

b) Authorities – all levels of government.

c) Interested parties – e.g., non-government organisations, local businesses, community based organisations.

d) Other stakeholders in addition to the above including:
Proponent or Developer
Permit Authority
Independent EIA Consultant
Specialist Consultants
Public Facilitator Consultant

7.1.2 Aims of the Public Participation process

The aims must be clearly identified and documented to ensure that they are in line with the requirements of the overall project. In establishing the aims, the following principles must be followed:

a) Recognition that the public consists of a wide array of individuals with different views, perspectives and interests.

b) Recognition that the public is a source of knowledge, experience and expertise.

c) There is mutual trust and respect among all partners ensuring a constructive dialogue.

d) Mutual recognition and acceptance of perceptions, interests and aspirations of the public

e) Establish and follow rules and procedures for conducting public meetings and consultations, which are mutually agreed upon.

7.1.3 Methods of Public Participation

A variety of techniques are available to achieve meaningful consultation and determining which technique is most appropriate will depend on:

a) The number of stakeholders and their characteristics including average level of education, environmental knowledge, and social and cultural status

b) The nature and in particular, the technical content of the information to be conveyed

c) The institutional situation of the country concerned, particularly the types of skills and financial resources available to the project.

d) Aims of the public participation process.

Methods used in the various stages of an EIA may differ depending on the aim of the public participation exercise. The methods need not be used in isolation, but can be combined to ensure the success of the public participation exercise.

There are different public participation methods available that have different capabilities for achieving public participation objectives (See Table 2).

Table 2: Techniques for communicating with the public (Sadar, 1996)

A	B	C	Public Participation Techniques	D	E	F	G	H	I
2	1	1	Public meetings	X	X		X		
1	2	3	Informal small groups meetings	X	X	X	X	X	X
2	1	2	General public information meetings	X					
1	2	2	Presentation to community organisations	X	X		X		
2	2	1	Information brochures and pamphlets	X					
1	3	3	Field trips and site visits	X	X				
1	3	2	Response to public inquiries	X					
3	1	1	Press releases inviting comments	X			X		
1	3	1	Letter requests for comments			X	X		
1	3	3	Workshops		X	X	X	X	X
1	3	3	Advisory committees		X	X	X	X	
1	3	3	Employment of community residents		X	X			X
1	3	3	Public representative		X	X	X	X	X
2	3	1	Public review of assessment decisions	X	X	X	X	X	X

A = Number of people reached

B = Ability to handle specific issues

C = Degree of two-way communication

D = Inform/Educate

E = Identify problems and values

F = Get ideas/ solve problems

G = Get feedback

1 = low

2 = medium

3 = high

H = Evaluate

I = Resolve conflict/obtain consensus

X = capability

7.2 PUBLIC PARTICIPATION IN THE SCOPING REPORT

The scoping report should be placed at public places such as libraries and municipal offices and well publicised to ensure that the public is afforded the opportunity to review it. This is to enable them to review the scoping report to ensure that their concerns have been addressed and the information in the scoping report is adequate. Further, a copy of the report should be sent to individuals and organisations that have registered as I&APs and specifically requested a copy for comment.

7.3 PUBLIC PARTICIPATION IN THE EIA

The public should be contacted for additional information not covered in the scoping report and provided with an opportunity to raise other concerns, if any. The type of public participation at the various stages of the EIA process are summarised below (Table 3):

Table 3: Types and timing of public involvement

Stages of project development	**Public Involvement Techniques**	
	Small project	**Large project**
Preliminary assessment of project concept	Informal contact with major interest groups	Brochures Information displays
Formulation of alternatives	Informal meetings Workshops	advisory groups questionnaires
Evaluation of impacts and alternatives	letters interviews	public meetings workshops
Project implementation		advisory groups

7.4 IMPORTANT CONSIDERATIONS IN PUBLIC PARTICIPATION

7.4.1 Record of views and correspondence

a) Copies of letters between the proponent and I&APs must be retained as a permanent record.

b) Attendance lists must be kept for all meetings.

c) Minutes of public participation meetings must be kept and where possible people present at the meetings should sign to confirm they agree that the minutes is a true record of the meeting.

d) All other correspondence (e.g. questionnaires, newsletters, and newspaper clippings) must also be kept.

e) Where relevant these records of views must be included in the reports.

7.4.2 Language and Culture

The language used in meetings should be that understood by the majority of the audience. The technical language should be sufficiently clear to ensure the audience understands the concepts being presented. There may be a need for translation. The facilitator should be sensitive to cultural requirements of the community including gender issues.

7.4.3 Facilitation

The facilitator should be impartial particularly on issues of conflict. Conflict management skills should be understood and applied throughout the meetings to minimise the risk of potentially explosive situations.

8 OTHER ISSUES

8.1 CLEARING AND CONTROL OF VEGETATION IN WAYLEAVE/SERVITUDE

A number of techniques are suitable for clearing vegetation from the wayleave/servitude and controlling the amount and type of new plant growth.
The different techniques should be evaluated and recommendations incorporated in the EMP.

8.2 HEALTH AND SAFETY HAZARDS

Design guidelines will minimise the risk of electrocutions from low-hanging lines or lines near human activity (e.g. highways, buildings etc). However, these situations should be avoided where possible. The same applies for flight paths in and near airports, which can be disrupted by towers and power lines. They can also endanger low-flying aeroplanes, especially those used in crop spraying and other agricultural management activities (World Bank, 1991).

"Despite the results of this considerable body of research, which focuses on the possible health effects from power frequency electric and magnetic fields (EMF), the topic still concerns people. Rigorous research over the past thirty years has shown, although no ill-health effects have conclusively been demonstrated from EMF exposure, the concern raised by some epidemiological studies that a low risk may be associated with long-term exposure and some types of cancer [1,2], has spurred a precautionary approach in some countries. The extent of this precautionary

approach does however vary widely, with most countries applying the limits of the International Commission on Non Ionizing Radiation Protection (ICNIRP)".

8.3 INDUCED DEVELOPMENT

Distribution lines may induce development in or bordering on wayleave/servitudes, or in lands made more accessible by the power line development. In places where suitable housing areas are limited, cleared wayleave/servitudes are often attractive sites for un-permitted housing. This in turn, results in other environmental impacts and overburdens local infrastructure and public services (World Bank, 1991).. Other negative induced impacts include illegal logging and poaching.

8.4 PROJECT ALTERNATIVES

The environmental assessment should include an analysis of reasonable alternatives to the distribution of electricity to load centres. This may lead to alternatives, which are more sound from an environmental, socio-cultural and economic point of view than the originally proposed power line project. The alternatives to be considered include:

a) Upgrading of existing facilities

b) Alternative routes and substation sites

c) Alternative methods of construction reducing costs and improving reliability

d) Alternative tower designs and materials

e) Alternative maintenance techniques and access road designs and layouts.

Alternative routes and substations sites are the most important activities for evaluation. Careful selection of substation sites and line routes can minimise environmental impacts resulting from electric power distribution lines (World Bank, 1991).

8.5 MANAGEMENT AND TRAINING

Sound route selection is one of the most critical aspects affecting environmental decisions associated with electrical power distribution line construction, operation and maintenance. In route selection, environmental practitioners need to work with the distribution line engineers to minimise the environmental impacts and in developing mitigation measures. Specialists in the field of ecological impact and social impact assessment play a major role in the environmental management of electrical power distribution lines (World Bank, 1991). Training in the environmental management of electrical power distribution lines should be a requirement for all staff working on electric power lines. This includes the proper use of chemicals and mechanical clearing methods for the wayleave/servitude.

The training should be done as part of the environmental assessment phase of the project and the environmental consultant must be involved. The environmental staff of the project sponsor should be involved in the environmental assessment study. This will ensure a good understanding of the environmental aspects of the project and provide an understanding of the rationale for the

recommended mitigation and monitoring that they will be required to implement. (World Bank, 1991).

Those undertaking screening, scoping or EAs should have a minimum competence level of environmental science expertise and experience, or as required by a professional body.

9 ENVIRONMENTAL MANAGEMENT PLANS

An environmental management plan (EMP) should outline the identified environmental impacts, measures to be undertaken to mitigate the impacts, responsibilities for mitigation, timescales, costs of mitigation, sources of funding and institutional measures to be taken during implementation and operation and decommissioning. The EMP should be formulated in such a way that it is easy to use, concise and should provide linkages to other relevant plans relating to the project. Cross referencing to the EA report or other documentation is recommended. Each mitigation measure should be briefly described with reference to the impact to which it relates and conditions under which it is required and reference should be made to designs, equipment descriptions, and operating procedures. Where the mitigation may result in secondary impacts, their significance should be evaluated. EMP should be dynamic and flexible and subject to periodic review. The EMP should clearly describe and justify the proposed mitigation measures to facilitate public consultation.

An EMP must be compiled after the relevant authorities have granted approval for the project. The EMP should also address the conditions of the record of decision (ROD) (conditions of authorisation from applicable authority). The EMP should be developed in collaboration with operational management team. This is essential to ensure that the recommendations in the EMP are practical and that staff are able and committed to carrying out the necessary environmental management actions.

Conditions contained in any statutory environmental authorisation, e.g. a Record of Decision from the relevant authority must be integrated into the EMP.

9.1 GUIDING PRINCIPLES FOR DEVELOPING EMP

Some guiding principles for developing EMP are listed below:

a) What is the issue; e.g. identify issues

b) How should it be mitigated;

c) Who is responsible for executing;

d) When should it be executed

e) Quality control during implementation;

f) Monitoring requirements; and

g) Audit frequency.

h) Reporting requirements

It is important to translate EMP requirements into bidding/tender and contract documents to ensure that obligations are clearly communicated to contractors. They should also be obliged to follow appropriate environmental, health, and safety standards. An EMP has the following benefits during the project life cycle:

a) Improved risk management, ensuring compliance with laws and regulations, reducing unforeseen liabilities and demonstrating due diligence;

b) Reducing impacts on the environment; and

c) Improving the company's relationship with the public and relevant authorities.

Also linked to the EMP is monitoring, to ensure that all mitigation measures and the conditions of the ROD are adhered to throughout all the phases of the project.

10 MONITORING AND REPORTING

Appropriate resources must be allocated to ensure that the implementation of the EMP is monitored over the life cycle of the project. This should include reporting of any non-conformance with the conditions of the EMP.

The type of environmental resources involved and the degree to which they are affected will influence the monitoring requirements for distribution lines.

To avoid negative land use and/or ecological impacts and ensure that proper mitigation measures are employed, construction activities should be monitored. This monitoring will be short-term (e.g. weeks) and will occur along the line as it is constructed. At crossings of major water bodies or wetlands, near wild lands and cultural properties, monitoring will be especially critical. All monitoring will be based on visual inspections of the materials being used, the construction practices and implementation of mitigation measures (World Bank, 1991).

Maintenance of wayleave/servitudes must be monitored to assure proper vegetation control methods and to prevent the invasion of exotic species. The success or otherwise of any proposals to take advantage of possible benefits to wildlife must also be monitored (World Bank, 1991).

11 CONCLUSION

It is critical that the EIA is not seen as a stand-alone exercise of the project life-cycle. The outcome of the EIA is an equally import management criteria as is the financial return on investment, and technical indicators. Most projects are either delayed or stopped because of the EIA, leading to serious financial, legal, and publicity risks.

The EIA is a tool to assist environmental managers and environmental authorities in making good decisions; to screen projects efficiently for their environmental impacts; to clarify to government what is needed for sustainable projects; and to design them effectively. An EIA should provide as much information as possible about a project, to enable the authorities to make a sensible decision and before costly problems arise during its construction and operation (World Bank, 1991). Based on current practices, authorisation to proceed is made for most EIA studies at scoping report level. It is only in cases where the environmental impacts of the project are significant that the project may be required to go through the entire EIA process.

This guideline should be adhered to and its implementation should be monitored. It is important to ensure that this guideline is in line with the current policies and legislative requirements of the PIESA member countries. The guideline should be updated to reflect changes in these policies and as further developments occur in the EIA process.

It is recommended that this guideline be reviewed every three years and changes made to ensure optimal implementation and that it is in line with current practices and policies.

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Annexure A
(informative)

Deviation schedule

1. Any deviation from, modification to, or alternative to the guideline shall be listed, with reasons for the departures from the specification. *(NOTE: No deviations/modifications/alternatives offered will be recognized unless listed on this schedule.)*

2. If no deviations/modifications/alternatives are offered, this schedule shall be marked N/A.

Table 4: Deviation Schedule

1	2	3
Specification or schedule page number	**Specification or schedule clause number**	**Proposed deviation/modification/alternative**

Annexure 2 OPERATIONAL ENVIRONMENTAL ISSUES AND MITIGATION MEASURES

Table 6 below indicates some of the environmental issues arising during the operation of electricity distribution infrastructure.

Table 6. A Limited Schedule of Environmental Issues and Mitigation Measures Related to Electricity Distribution Operations

Issues	**Mitigation measures**
Wildlife incidents	These should be minimised through design, and if they cannot be avoided, they should be minimised through mitigation measures
Oil spills	Oil spills should be prevented through pre-task planning and effective emergency programmes implemented. However, should they occur, the areas affected by oil spills must be demarcated and rehabilitated, waste oil must be stored on sealed containers and recycled.
Contravention's of environmental legislation	Effective monitoring and or imposing punitive measures
Electromagnetic fields	A specialist study on electromagnetic fields
Hazardous substances and spillage's	Proper storage and handling of hazardous substances must be done
Vegetation management	Sound policies on vegetation removal and effective monitoring
Public complaints relating to environmental issues	A hotline must be maintained where the public must voice the complaints