# MSI CELLULAR INVESTMENTS HOLDINGS PLC ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

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## Retrenchment Plan Outline

Proposed contents of a Retrenchment Plan to be submitted to MSI Board of Directors:

*Description of the Past and Proposed Retrenchment:*

- Magnitude, rationale and timeframe;
- Characteristics of the labor force (number of men and women employed by skill level and type of contract);
- Adequacy of past/current staffing levels and need for retrenchment from a business point of view;
- Size of the retrenchment (number of men and women affected by skill level and type of contract);
- Retrenchment schedule;
- Relevant economic context, including:
  - situation of the local economy, as it relates to the retrenched workers' ability to find new jobs or start new businesses;
  - importance of the firm/enterprise in the local economy; and
  - main trends in the sector in which the firm operates (projected growth, level of employment, wages, foreign and domestic investment, etc.).
- Retrenchment methods and procedures, including:
  - methods anticipated (voluntary retirement, severance packages, layoffs, etc.);
  - consultation and negotiation with labor organizations, worker's representatives, community organizations, government representatives, NGOs, etc.;
  - methods that will be used to select the workers that will lose their job;
  - strategies to prevent the disproportionate representation of a social group (e.g., women or members of a particular ethnic or religious group) among the retrenched workers.
- Management arrangements, including:
  - party or parties that will direct/supervise the retrenchment process;
  - parties that will provide technical assistance; and
  - grievance procedures.
- Legal/institutional framework, including:
  - legislation that applies to early retirement, provision of severance packages, layoffs, etc.;
  - legal role of trade unions or other representative bodies in the retrenchment process;
  - relevant agreements with labor unions or other labor representatives;
  - compliance of planned retrenchment with applicable legislation and agreements (or evidence that past retrenchment complied);
  - coverage of retrenched workers by unemployment insurance or any other welfare programs; and
  - eligibility of part-time or contract workers to receive benefits or assistance.
- Anticipated impacts on retrenched workers, including:
  - prospects of retrenched workers (market demand for their skills);
  - eligibility of retrenched workers for unemployment benefits or other benefits; and
  - anticipated impact in terms of reduced (or increased) net worth, income flows, etc.
- Other impacts, including:
  - impacts at the local community level; and
  - ability of the national or local government to pay entitlements of retrenched workers, such as unemployment benefits.
- Compensation and assistance to be provided to retrenched workers:
  - compensation anticipated by skill level and type of contract;
  - training programs;
  - career and medical counseling;
  - assistance to set up micro-enterprises.

- Monitoring of the retrenchment process:
  - indicators to be monitored (e.g., situation of the retrenched workers, payment of entitlements, outcomes of assistance provided, etc.);
  - frequency of monitoring activities; and
  - party or parties that will carry out the monitoring activities.

Supporting documentation of the plan (for example, references of written materials, record of consultations with affected workers, tables, etc.) should be included in an appendix.

*Reporting*

The client is normally requested to submit annual reports on the progress and impact of the retrenchment.[1] The reports should cover the following aspects, as appropriate:

- Compensation paid to retrenched workers;
- Employment situation of retrenched workers;
- Insurance coverage of retrenched workers that remain unemployed (i.e., unemployment insurance);
- Ability of the local/national government to pay unemployment insurance and other entitlements to retrenched workers;
- Assistance provided to retrenched workers (e.g. training programs, career counseling, and assistance to set up micro-enterprises);
- Outcomes of the programs to assist retrenched workers.

[1] The reports can be part of the Annual Monitoring Reports, unless the retrenchment plan establishes more frequent reporting periods.

# MSI CELLULAR INVESTMENTS HOLDINGS PLC
# ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

## CONTENTS

# 1 INTRODUCTION

This document describes MSI's environmental and social management plan, which addresses potential social, cultural and environmental impacts that could result from the expansion and operation of MSI's cellular telecommunications networks. As MSI holds extensive cellular telecommunications networks across Africa and the Middle East, its impact on society and the environment, both positive and negative, is high. The preparation and implementation of this ESMP has been developed to help MSI minimise the potential for negative impacts and to enhance the positive impacts.

Potential issues addressed by this ESMP are based on those identified in a preliminary environmental review (GIBB, 2001), international best practices and standards and guidelines of MSI's investors.

## 1.1 Project description

The MSI Group operational activities primarily involve the construction and maintenance of cellular antennas in urban and rural environments throughout a given country or region. Additional operations include the expansion and operation of fixed line networks. In some cases the expansion of these networks can include the construction of antenna sites in national parks, reserves or other sensitive ecological and culturally important areas. While the sites in the parks and reserves are identified to be susceptible to impacts, MSI too acknowledges the importance of preserving the environment in all areas, be they rural or urban.

## 1.2 Applicability of this ESMP

This ESMP applies to all MSI Group holdings. Its implementation, specifically regarding operations and maintenance, is mandatory, even for established networks. This ESMP addresses three main issues; general operations, network roll-out (site acquisition and site construction), and site operation. Each site is categorised into either urban, sub-urban/rural or those located in culturally and environmentally sensitive areas, such as national parks and reserves.

## 1.3 Intent of this ESMP

This ESMP is designed to minimise potential environmental, social and cultural impacts associated with the expansion and operation of MSI Group cellular communications networks. It provides internal monitoring measures for tracking environmental performance at the corporate and holding company level. It has been prepared by MSI in co-operation with GIBB (Eastern Africa) Ltd, with technical support from the International Finance Corporation (IFC). Mitigation measures can be incorporated into the project through appropriate design criteria and good construction and management practices. Procedures outlined in this ESMP are to be incorporated into the standard operating procedures of MSI holding companies and their contractors such that they comply with applicable local, national and international standards and regulations.

This ESMP outlines measures and procedures to be adopted by MSI staff and their contractors to minimise potential social and environmental impacts that could result from the construction and operation of cellular and fixed line communications networks. The documentation procedures outlined herein address the specific issues that may be applicable

during the various stages of network roll-out and operation. This ESMP addresses the environmental and social issues required for development projects as outlined in the World Bank Environmental, Health and Safety Guidelines for Telecommunications, as well as other internationally respected documents.

The tasks and procedures described herein are designed to existing and anticipated operational conditions. As equipment, staff responsibilities, contractors, regulations and services offered by MSI may change over time, so too may this ESMP. It is a dynamic plan, subject to updates and revisions on an annual basis, coinciding with annual audits described in Section 8.6 of this report. These steps will ensure that MSI maintains and improves its environmental and social stewardship.

## 1.4 MSI environmental and social policy

MSI is a leading provider of mobile telephonic networks in Africa and the Middle East. MSI is committed to delivering economic and quality of life benefits to the communities within which it operates by enabling communication without transportation, without paper and without major infrastructure construction. MSI seeks to enhance these benefits by either avoiding or significantly minimising wherever practicable any adverse impacts that its activities might have on the environment and society.

MSI has an overall commitment to technical and business excellence and continual improvement. As part of this, it undertakes to follow recognised international best practices in environmental and social performance. Good environmental and social performance is sound business practice, creating sustainable value for MSI's employees, customers, suppliers, partners, investors and the communities in which it serves. MSI thus places a high priority on its corporate environmental and social reputation, where it endeavours to set an example for the countries in which it operates, and seeks to implement policies uniformly throughout group operations.

MSI's environmental and social policy is to:

- ensure a continued improvement in environmental and social performance, both internally and within the local communities in which it operates;
- prevent or substantially minimise environmental impacts and save natural resources in the operation and growth of its business through the integration of environmental concerns into design and planning processes, the implementation of appropriate waste management and pollution control procedures, avoidance or phase out of toxic substances, the promotion of eco-efficiency and use of renewable energy;
- fully comply with the requirements of national regulations and legislation, as well as group and investor standards, with regards to human health and the environment;
- set target levels of environmental performance and ensure that all potential environmental and social impacts are considered;
- continually monitor and improve environmental and social performance and prevention of pollution through the development and implementation of an ESMP;
- conserve and enhance the environment in and around project locations as part of the MSI Group's standard operating procedures;
- provide a high quality and safe working environment for employees, enhancing their abilities through training and knowledge transfer and ensuring the ability to attract and retain high calibre staff;

- be an equal opportunity and meritocratic employer, with no bias with regard to gender, health, disability, race or religion, rewarding staff fairly for good performance and providing them with first class benefits to improve health and living standards;

- provide quality of life benefits to the wider communities within which MSI operates.

By establishing high environmental and social standards and incorporating them into standard operational procedures, MSI will remain at the forefront in the telecommunications sector. MSI will achieve these objectives through appropriate management, monitoring, reporting and review systems, as outlined in this ESMP.

## 1.5 Environmental and social management organisational structure

The compliance of MSI to the ESMP is directly effected by the field staff, whose observations and methods will initiate much of the corrective environmental and social actions. Such key staff include, but are not limited to, maintenance technicians, construction supervisors and site acquisition staff.

The Managing Director of each MSI holding will ultimately be responsible for compliance with the ESMP. He/she will appoint an Environmental Officer who will be responsible for the implementation of the ESMP, the maintenance of environmental and social records, internal reviews and preparation of annual environmental and social audit reports. The annual environmental and social audit report, described in Section 8.6, will be reviewed and approved by the Managing Director, who will then forward the report to the MSI Chief Operating Officer.

The Chief Operating Officer is responsible for the company wide implementation of this ESMP. He reports directly to the Chief Executive Officer, who in turn reports to the board of directors. The Chief Operating Officer will present a summary of environmental and social issues, as derived from the annual environmental and social audit reports for each MSI holding. An organisational chart for environmental and social management is presented as **Figure 1**.

# 2 GENERAL OPERATIONS

In the new global economy, the successful companies will be those who are most efficient in their use of resources. In doing so, companies can not only gain an edge on their competition, but also reduce their overall impact on the environment. MSI and its holdings should track the monthly use of specific resources to identify areas where it is possible to reduce the volume used, through reduction, reuse and/or recycling. Formal reduction programs should be initiated to document improved efficiency. The ultimate goal is to reduce operating costs and minimise MSI's overall impact on the environment.

The following sections identify some of the operational resources used by MSI that can be easily monitored as part of a minimisation program. It is understood that each holding is subject to regional and local institutional limitations, therefore only general recommendations are offered herein. It will be up to the management of each holding to determine how best to approach this issue.

## 2.1 Paper use management

Copy paper is typically one of the highest volume resources used in a modern office. Based on the relative volume of waste paper to other office wastes, it is often the least efficiently used resource. MSI holdings must, where available, use paper products that are composed of recycled materials. In addition, segregating non-confidential waste paper for recycling should be required where viable recycling options exist.

Recycling, however, does not offer a means for reducing the volume of paper used. Efficiency in the use of paper products is necessary. To address this, the following recommendations should be implemented:

- Use double sided printing for all documents,
- Use electronic/paper free editing of draft documents,
- Use paperless memoranda or documents for internal communication,
- Encourage internal recycling of paper for informal uses (scrap paper), and
- Identify sources for waste paper (i.e. recycling, paper product manufacturers, etc) and implement a waste paper segregation and delivery program.

Other options may be determined on an individual basis, based on available institutional limitations. Where formal recycling is not available, holdings should research alternative options for paper disposal. Often there are companies that can use waste paper in one or more of their products or processes. An example might be a company that produces pressed fibreboard products, paper machete or cardboard crafts. Charities, such as children's homes, may need scrap paper for children's arts and educational materials. Identifying such options could help local society and the local micro-economy. The ultimate goal is to minimise the volume of paper from accumulating in landfills and dumps.

## 2.2 Water use management

In many parts of Africa, water resources are in very limited supply. Efficiency regarding its use is essential both environmentally and economically. MSI owns office buildings in every country in which it operates. Research should be performed to identify options regarding the reuse of grey water, the installation of water saving devices such as faucet aerators, automatic shut-off valves, efficient toilet systems, etc. Such programs may require capital expenditures, therefore a cost benefit analysis should be performed. The overall goals are to identify means to reduce

the volume of water used by each holding. The benefits will be both financial and environmental.

## 2.3 Fuel consumption management

MSI's holdings employ the use of automobiles for management, sales and maintenance staff. In order to minimise the volume consumed, and thus create awareness, each holding should monitor the monthly volume of fuel purchased for transportation purposes. By monitoring this, awareness is created and an internal improvement program can thus be initiated. Staff should be encouraged to identify areas where fuel consumption can be reduced without reducing the quality of service or product. The goal is to minimise the volume of fuel consumed, thus reducing emissions and overhead costs.

## 2.4 Electricity use management

Africa is becoming more dependent on electricity generated via combustion of fossil fuels. The environmental effects of this are believed to impact on global temperatures. Reduction in energy use should result in a reduction in the combustion of fossil fuels. Therefore, in the construction and renovation of offices, energy efficient fixtures and systems should be used. These might include low-watt lighting systems, motion sensors for indoor lighting, shading/windows to enhance natural lighting and assist in temperature control, natural ventilation, etc. As above, the goal is to identify options that can result in the long-term reduction in electrical use.

Electrical efficiency involving technical operations should also be considered where economically and logistically possible. This may include alternative energy sources, such as the use of solar voltaic arrays at rural tower sites where connection to the national electric grid is not available. Such issues are site specific but warrant consideration.

## 2.5 Organisational structure for general operations

The head of administration for each holding will be responsible for tracking and reporting of internal resources use. Additional resource information may be added as determined applicable. The data regarding monthly use of resources will be provided to the environmental officer in order that it may be incorporated into the annual environmental and social audit report.

# 3 SITE ACQUISITION PROCEDURES

## 3.1 Site selection criteria

In order to develop an effective telecommunications network, the selection of antenna sites must consider more than just the technical parameters, but also socio-economic, historical, cultural, environmental and employee health & safety factors. The first priority in selecting antenna sites is to negotiate a lease to utilise existing structures, such as tall buildings and towers, or previously developed land where possible. Only when this prospect is determined to be unavailable does MSI pursue developing greenfield land.

The antenna site selection process utilised by MSI is based on the following priorities:

1. To develop on land that does not conflict or interfere with historical, archaeological or cultural qualities;
2. To develop on land that does not require the economic or physical displacement and/or resettlement of people.
3. To develop on land that is not located in, or in the immediate vicinity of, an environmentally or culturally sensitive area.
4. To install roof mounted antennas that will not be located within 25 m (laterally) of other structures.

Taking the above factors into consideration, MSI's primary objective should be to establish partnerships with established organisations for the co-habitation of their antennas on previously developed land. In addition to the financial savings, the benefits of such partnerships are the reduction of potential environmental and social impacts and minimisation of logistical issues such as available utilities, site access and security.

## 3.2 Site selection process

The Radio Planning Group identifies a general area (with a radius of approximately 500 m) in which the location of an antenna is optimal regarding technical requirements. After this, a radio engineer must perform a field reconnaissance to identify and validate at least three candidate sites for the proposed antenna. During this reconnaissance, and in addition to considerations regarding technical communications, the radio engineer shall perform an environmental assessment (described in Section 3.2.1) to ascertain the potential issues that could arise as a result of development. During the site validation process, the radio engineer will:

1. Clear each candidate site following the criteria listed in Section 3.1 above;
2. Screen each site to determine technical, social and environmental compatibility;
3. Complete site evaluation forms for review by the Site Acquisition Group Leader.

MSI will not lease land for antenna sites if such development would require the economic or physical displacement or resettlement of people. To ensure this, MSI's site acquisition staff shall research the history of prospective sites to avoid possible disputes.

### 3.2.1 Site environmental assessment considerations

In order to minimise the potential social, historical, cultural and environmental impacts caused during later stages of site development, the following issues shall be considered initially during the site reconnaissance visits and later while comparing the optional locations:

1. Current, historical and cultural use of the property;
2. Potential visual impact;
3. Existence of informal settlers residing or deriving benefit from that site;

4. Location of existing structures;
5. Available utilities that may interfere with the site;
6. Stability of site to erosion;
7. Evidence of wildlife;
8. Description of vegetation;
9. Proximity to ecologically sensitive areas;
10. Required levelling or site modifications;
11. Location of sensitive land uses such as residential, schools, hospitals and other community facilities;
12. Site access and security issues;
13. Risk to public from RF or microwave radiation (i.e. for roof mounted antennas).

In addition to the above considerations, informal interviews with local, potentially interested parties should be pursued where possible. Field data forms will be used to document site conditions. The standard Site Acquisition Assessment Form (RO_01) is provided in Annex A.

### 3.2.2 Considerations for sites in national parks and reserves

For the selection of sites in national parks and reserves, as well as those in rural areas that are considered culturally or ecologically sensitive, an environmental impact assessment may be required prior to development. Sites will be considered culturally or ecologically sensitive if, during the site research and reconnaissance visit, one or more of the following issues applies:

1. Presence of wetlands within 100m to the site;
2. Presence of protected or endangered flora identified on site;
3. Presence of fauna identified on site;
4. Site is of cultural, historical or archaeological significance.

In such cases, guidance from local experts and/or the applicable regulatory authorities will be sought. This is described in detail in **Section 6**.

## 3.3 Organisational structure for site selection process

A radio engineer initiates the site acquisition process by identifying and validating candidate sites. The candidate sites that are found to best meet the technical, social and environmental criteria are then presented to the Operations Manager for approval. The Operations Director shall oversee this process and have final authority regarding decisions. Additional consideration and title deed research should be performed to confirm that all candidate sites meet the selection criteria prior to undertaking lease or purchase negotiations with land owners.

Copies of the completed Site Acquisition Assessment Form (RO_01) for each site will be stored in the project files and reviewed during the annual environmental and social audit.

# 4 DESIGN AND SITE CONSTRUCTION PROCEDURES

Negative impacts have the highest probability of occurring during roll-out construction activities. Good design, construction and management practices and an adequate monitoring programme should ensure that negative impacts do not result from the construction of works, such as switches, antenna sites, fixed lines, offices, etc.

The majority of roll-out activities involve the construction of antenna sites. A typical antenna site is set on a plot of land with approximate dimensions of 10 m by 10 m. Unless mounted on existing structures, the works will usually include one 30m - 50m high, free standing antenna tower anchored on concrete footings. Four radio frequency (RF) cells are mounted near the top of the antenna, along with one or two microwave transmitters. There is one metal container on site housing the telecommunication equipment. Also on site is a diesel generator equipped with a built-in 100-litre fuel tank. A guardhouse is also included at some sites. The site is contained within a 3-4 m high fence of varying material. Aside from the concrete footings on which the tower and works are mounted, the yard is surfaced with gravel.

Line networks involve antenna sites for microwave links, and a combination of underground and overhead lines. When underground lines are designed, vaults with manhole access ports are located at strategic points for maintenance purposes. Overhead lines are mounted on poles that run along roads and utility easements.

## 4.1 Design considerations

In the design of networks, the following should be considered and documented:

1. Maximise the use of local resources and materials;
2. Where overhead lines are required, the sharing of existing power poles or other suitable structures is encouraged;
3. For overhead lines, the use of reinforced concrete poles or timbers originating from recycled or managed forests is encouraged;
4. Where practicable, blending of towers and other large works into the surrounding visual environment;
5. Sharing of existing antennas with other telecommunications companies is encouraged;
6. Minimising the alteration of local hydrology and drainage characteristics.

The new equipment installed at each antenna site should be certified as free of ozone depleting substances (ODS) and polychlorinated biphenyls (PCBs). Where this is not possible, then a management plan should be prepared that includes safety labelling, inventory tracking and provisions for the safe replacement and disposal or the said compounds. Refer to Section 5.1.4 regarding the management program for ODS and PCBs.

The generators selected for all sites shall be equipped with silencers and rated at no higher than 76.5 dB(A) at 1 m (50 Hz). Such a rating should ensure that noise standards are maintained at the nearest off site receptors.

## 4.2 General construction procedures

The construction contractor for network sites is required to comply with MSI environmental, health and safety (EHS) conditions stipulated in the construction contract and described herein. Where possible, construction methods should be labour intensive and involve a limited amount of heavy machinery. For the excavation of foundations, vaults and footings, safe conditions must be maintained and continuously monitored. The use of mobile cranes to mount heavy equipment and erect towers should be limited. Most sites require approximately one month for construction, much of which is to allow for the curing of the concrete footings.

## 4.3 Potential EHS issues

Potential environmental and social issues that can result from the construction of antenna sites are listed below:

1. Vegetation clearance;
2. Soil erosion;
3. Changes in hydrology;
4. Impact on wildlife;
5. Impact on grazing/agriculture;
6. Impact on adjacent homes/businesses;
7. Pollution due to dust;
8. Noise;
9. Solid and liquid wastes;
10. Employment of casual labourers;
11. Occupational safety, including personal protective equipment;
12. Impact of cultural heritage, such as archaeological chance finds.

### 4.3.1 Vegetation clearance

The construction of network facilities will often involve the clearing of some vegetation. In most cases this shall be limited to antenna sites, along overhead line easements and short access roads. Consideration shall be made in selecting a site, as well as a layout, to minimise the need to remove vegetation, particularly well established trees. The direct impact from vegetation removal would be aesthetic impairment. Vegetation will be useful in screening the visual impact of the works. An indirect impact may include a disruption of drainage, which could lead to soil erosion.

### 4.3.2 Soil erosion

The potential for soil erosion is of concern for both environmental and structural reasons. Soil stability shall be visually assessed during the site selection phase of the project. Precautions to minimise soil erosion during construction will include the use of temporary berms or filter fabric fences. In addition to this, gravel is used to cover bare surfaces within the antenna sites, thus minimising the potential for erosion. Drains leading from sites must be designed such that erosion off-site does not occur as a result of the redirected water.

### 4.3.3 Changes in hydrology

During site construction, grading or levelling of some sites may be required, which could alter the local drainage patterns. Although this issue is considered during the site selection process, it shall remain an issue during construction. The disposal of excess soil will depend on specific site conditions, but it should be managed such that it does not cause additional damage to the local environment or increase erosion. Erosion from the construction site, or the improper re-

routing of drainage ditches, could negatively impact the local ecology and/or undermine the antenna foundation.

### 4.3.4 Impact on wildlife

For sites within game parks and reserves, as well as those that meet the criteria as ecologically sensitive, MSI shall seek the advice of the local wildlife regulatory authority or independent experts to ensure that sensitive habitats and ecosystems are not permanently impacted.

### 4.3.5 Impact on grazing/agriculture

Careless management of excavated soils, building materials storage and vehicle parking can impact small-scale agriculture and grazing. Identification and protection of small-scale grazing and agriculture adjacent to construction sites will be the responsibility of all site staff and ultimately the site supervisor. The lateral boundary within which workers and equipment may extend will be defined prior to groundbreaking and strictly enforced.

### 4.3.6 Pollution due to dust

Depending on the meteorological conditions, construction operations are likely to create dust or mud. MSI shall plan construction of sites to coincide with optimum conditions. If the construction occurs during the dry season, measures such as soil wetting shall be taken to minimise the generation of dust. No construction activities will be performed on Sunday in the park sites. These issues shall be addressed on a per site basis depending on their specific conditions.

### 4.3.7 Ambient noise

Noise levels from each site shall remain within the World Bank standards shown in the following table (IFC, 1998):

**Ambient Noise**

| | Maximum Allowable $L_{eq}$ (hourly), in dB(A) | |
|---|---|---|
| Receptor | Day-time 07:00 - 22:00 | Night-time 22:00 - 07:00 |
| Residential; institutional; educational | 55 | 45 |
| Industrial; commercial | 70 | 70 |

If the above listed levels can not be achieved due to higher background levels, then the site should not cause an increase in background levels of more than 3 dB(A). Noise levels should be monitored from receptors located outside the property boundary. The appropriate authority should be consulted concerning an acceptable noise level for antenna sites within national parks and reserves.

During construction, the maximum noise level of 55 dB(A) will not always be attainable, due primarily to the use of heavy machinery. This is likely to result in only a short-term impact. In addition, techniques to reduce the noise level, such as temporary sound barriers, should be considered where necessary.

### 4.3.8 Solid and liquid wastes

Construction activities will generate solid waste from excess building materials as well as waste generated by the site staff. This issue is addressed in the construction contract, which shall be enforced by the MSI Construction Supervisor.

### 4.3.9 Casual labourers

The use of casual labourers from the surrounding area, over and above permanent staff, is encouraged for work that does not involve heights or hot work (i.e. welding). A site health and safety plan must be prepared and the site staff briefed on the potential hazards before work commences. Clauses regarding the health and safety of the construction staff shall be outlined in the construction contract.

## 4.4 Construction contractor oversight

The MSI construction supervisor will inspect the works on a weekly basis or as necessary depending on site activities. MSI construction supervisor has the right to cease construction activities if he/she determines conditions on site to be potentially dangerous to human health or the environment. This may be until such time as the necessary measures can be taken to correct the situation.

## 4.5 EHS conditions for construction contractors

Environmental, health and safety conditions for the construction contractor should be included in the standard construction contractor agreement. The MSI construction supervisor shall be aware of, and charged with ensuring that the construction contractor complies with the EHS conditions, which are summarised as follows:

1. The Contractor will issue all necessary notices and obtain the required licenses and/or permits necessary to undertake the works. Further, the contractor will keep MSI indemnified against all penalties and liabilities of any kind for breach of any statute, ordinance or other law/regulation.

2. The Contractor shall at all times during working hours retain a competent supervisor approved by MSI. Such approval may be withdrawn by MSI at anytime, after which the contractor shall replace the supervisor to MSI's satisfaction.

3. Approved safety helmets, eye protection, apparel and shoes shall be worn by all Contractor's personnel at all times while on site.

4. The Contractor must observe all environmental, health and safety procedures as outlined in MSI's construction contract.

5. The contractor shall take all reasonable precautions to protect the works, workers, public and environment and shall provide, where necessary, temporary fencing, barriers, guards, warning signs, etc.

6. No warning sign, cable or marker post may be removed without obtaining the necessary municipal clearance.

7. In the event that unprotected utility lines are encountered during excavation activities, work shall cease until the proper authority is contacted and has issued clearance to continue. The same applies if safety tiles or similar underground protective devices are encountered.

8. Whenever possible, trees, plants and ground cover shall not be damaged either on site or adjacent land.

9. The construction site shall be kept clean at all times and appropriate measures shall be taken for the storage, transportation and disposal of solid and liquid waste materials.

10. The Contractor shall be responsible for adequate sanitary facilities for his/her workforce.

11. The Contractor shall take all reasonable measures to prevent spillage and leakage of materials likely to pollute air, soils and watercourses.

12. The Contractor shall take precautions to minimise the generation of airborne dust. Similarly, precautions shall be made to minimise soil erosion from site via the use of berms, hoarding or silt fences.

13. All operations necessary for the execution of the works shall be carried on so as not to interfere unnecessarily or improperly with public access to and use of public utilities.

14. On the completion of the works, the Contractor shall clear away and remove from the site all construction materials, rubbish and temporary works of every kind, leaving the site in as near a condition as before construction or to the satisfaction of the MSI construction supervisor. This may include grading or removal of excavated soils, disposal of excess building material, etc. Construction wastes shall be disposed in a previously agreed disposal site.

15. The Contractor shall not perform 'hot work', such as welding, grinding or cutting, without providing their personnel with the necessary protective equipment to prevent damage or injury to the work and personnel.

16. Gas welding torches and hoses shall not be left unattended in or near confined spaces. When left unattended, the main valve on the cylinders shall be closed and locked.

17. Electric arc welding equipment shall be maintained in a safe working order such that cable insulation is intact and free of exposed wires.

18. Waste paints, cleaning solvents, rags and other related items must be containerised such that they will not leak or otherwise affect the environment. Disposal of such items shall be detailed by the contractor prior to construction and be consistent with international standards.

19. The Contractor shall, where possible, confine his activities to the specified job site and shall not spread on to adjacent lands.

20. Emergency procedures shall be conveyed to contractor personnel, with weekly refresher notices included. The contractor shall indemnify and hold MSI harmless from and against any claims for injury and death arising out of accidents on site.

21. All welders employed on site shall possess trade certificates.

22. All staging, scaffolding, ladders, hoists, etc shall conform to all relevant standards. Reports of the examination of such equipment, as may be required by local law, shall be made available to the Construction Supervisor.

23. Personnel working overhead shall wear safety harnesses. Personnel shall be trained in the proper use of safety harness equipment.

24. All pressurised gas cylinders shall be tested and maintained in accordance with relevant international standards. When not in use, the screw caps must be fixed securely in place.

25. All crane operators and rigging supervisors shall possess trade licenses and have similar past work experience.

26. For sites that require the completion of an EIA, MSI shall ensure that the construction operations comply with any additional requirements outlined within the EIA report.

27. Participate in selective EHS training provided to MSI staff.

## 4.6 Construction site safety procedures

The construction contractor will document weekly activities using the Weekly Construction Supervision Form (RO_02), provided in Annex A. This field form will detail the occurrence and subsequent corrective actions to impacts regarding ecology, hydrology, product release, waste management and overall site conditions. The MSI construction supervisor will review the weekly EHS monitoring sheets to confirm compliance with site safety conditions.

A general site safety procedure is to be followed during all site construction and maintenance activities. A General Safety Procedure (O&M_02) must be followed. In addition, specific procedures for tower (O&M_03), roof (O&M_04) and confined space safety (O&M_05) must be followed. A Safety Equipment Checklist (O&M_06) must be filled out as part of every site maintenance activity. These safety procedures are provided in Annex B.

It is an integral part of any safety program that documentation takes place as soon as possible following a safety incident so that the cause and means of prevention can be identified to prevent a recurrence (FR, 1994). In the event an accident results in personal injury or equipment damage, an Incident Report Form (HR_01), provided in **Annex C,** must be completed by the Construction Supervisor, who shall forward the completed report to the appropriate staff.

In the event that an employee is involved in a fall or near fall, the Tower Safety Procedure (O&M_03) and/or Roof Safety Procedure (O&M_04) shall be reviewed to determine the need for additional equipment, procedures or training. A similar review should follow any safety incident occurring in a confined space (O&M_05). This should prevent similar types of falls or incidents from occurring in the future.

## 4.7 Implementation for site construction

Site construction will involve numerous tasks, many of which involve some degree of risk, be it environmental or health and safety. In order to document EHS conditions, and thereby document issues that may later be avoided, the construction EHS sheet will be completed weekly by the construction contractor's designated EHS officer. The EHS sheets shall be reviewed by the MSI construction supervisor on at least a weekly basis to ensure that construction site conditions comply with the standards described above. Corrective measures will also be suggested and/or approved. The EHS sheets, along with corrective actions, will ultimately be approved by the Chief Technical Manager, and be included in each site's annual EHS report.

# 5 SITE OPERATION METHODOLOGY

During site operations, maintenance technicians will perform monthly environmental site inspections to ensure that EHS conditions are maintained. During generator fuel delivery, maintenance technicians will be on site to confirm that the fuelling contractor complies with the prescribed safety procedures. During maintenance operations that require climbing the antenna, two maintenance technicians will be on site; one to perform the overhead maintenance work and one to assist and act as safety officer from below.

## 5.1 Operational EHS issues

The antenna sites will be unmanned during operation except during the monthly maintenance visit and refuelling operations, which will involve one MSI Maintenance Technician, who will oversee refuelling operations by MSI's contractor. Sites outside the parks and reserves will have 24-hr security guards working in 12-hr shifts.

Environmental issues to be inspected and monitored include:

1. Ambient noise, primarily from the generator;
2. Generator exhaust;
3. Generator efficiency;
4. Fuel delivery supervision;
5. Solid and liquid waste management;
6. Soil and surface water impacts;
7. Polychlorinated biphenyls (PCBs) and ozone depleting substances (ODS).

Potential occupational health and safety issues to be inspected and monitored include:

1. Air quality;
2. Noise;
3. Falls;
4. Electrocution;
5. Fire;
6. Confined space;
7. Radio frequency exposure;
8. Hazardous materials handling;
9. Mechanical hazards.

### 5.1.1 Ambient noise

The primary sources of noise at antenna sites are the generators. At sites where electrical service is not available, the generators run for periods ranging from 12 to 20 hours, mainly to recharge the batteries. The site generators should be equipped with a baffled silencer and have a sound pressure rating of no more than 76.5 dB(A) at 1 m (50 Hz).

To further reduce noise, consideration should be given to additional shielding or placing the generator in an insulated metal container from which the exhaust is directed through a baffled vent. Actual conditions will vary from one site to another, depending on such factors as the proximity of the nearest receptor, topography, wind direction, etc. Noise surveys will be performed at each site prior to commissioning, and random noise surveys will be performed at a representative number of sites (say, 25%), proportional to site categories, on an annual basis. Additional silencers are available from the generator manufacturer and shall be installed in the event that noise levels at nearby receptors exceed the MSI target 40 dB(A) threshold.

During the said noise survey, readings will be measured by maintenance technicians using a calibrated decibel meter from inside the fenced compound near the guard house, from 5 m

outside the compound in the direction nearest to the generator exhaust, and from the nearest receptor. Survey results will be documented on the monthly EHS Maintenance Form (O&M_01).

As part of the monthly inspection, the fuel efficiency of each generator will be estimated based on the volume of fuel consumed divided by the net hours of operation. This will not only identify the need for maintenance, but also act as a precursor to other potential problems, such as loss of compression due to wear of cylinders and valves, or a leak in the exhaust manifold or muffler, both of which might contribute to higher noise volume.

In the event that tenants from neighbouring properties complain of noise from the antenna sites, the complaint will be documented and passed to the Operations Manager, who will dispatch a maintenance technician to the site to investigate the validity of the complaint and its possible cause.

### 5.1.2 Radio frequency

The GSM cellular system is based on VHF waves, which fall between 30 and 300 mega-Hertz (MHz). Research has not shown VHF radiation to cause negative health effects due to exposure. The microwave transmitter/receivers, however, can cause negative health effects to humans if direct exposure occurs. This, however, is not considered a serious threat, as the transmitter/receivers are directional and require that there are no interfering objects between stations. Some spillage from the microwave transmission does occur, and it is this that must be considered in the design and location of antenna towers.

The threat to public health due to non-ionising radiation is a consideration in the design of the cellular communications system. According to the US Federal Communications Commission guidance (FCC, 2000), a transmission antenna that is not mounted on a building, and is at least 10m above ground, is exempt from monitoring due to the low threat to the general public from RF radiation. MSI towers are 42m in height, and the cells and microwave transmitter/receivers are mounted near the top. Therefore, the MSI tower design can be considered relatively safe, based on current international guidelines.

Roof mounted antennas in urban environments, however, pose a higher threat from horizontal exposure. The worst case horizontal distance that should be maintained from a single, omni-directional, cellular antenna is approximately 10 m (FCC, 2000). MSI shall not install roof mounted antennas that will be located within a more conservative threshold distance of 25m to other structures. This is addressed during the initial site assessment and is monitored during the operational phase of each antenna site.

Some free standing tower sites will have night-time security guards, who shall be made aware of the safety hazards associated with the microwave transmitters. Roof mounted antennas will be surrounded by a fenced enclosure to prevent unauthorised people from gaining access. At all antenna sites, signs shall be posted warning of the existing hazards, using symbols and the languages that are most recognized.

### 5.1.3 Solid and liquid wastes

Waste disposal laws are poorly enforced in many African countries, and the disposal of wastes in an "acceptable manner" can prove to be problematic due to institutional limitations (i.e. lack of landfills, treatment facilities, recycling, etc). Solid wastes generated at the tower sites, such as rubbish from guards and maintenance technicians, will be containerised on site and transported for disposal by maintenance technicians following each inspection.

Used oil generated from the antenna sites will be collected during routine oil changes (250 hrs or 3 months) and stored in 200 L drums at a central staging area. The Environmental Officer should research the viable options regarding its disposal. Recycling should be considered as the best option, but it may not be available to every holding. Disposal of used oil via incineration remains an alternative option. Detailed chain of custody records regarding used oil disposal must be maintained. The maintenance technician or contractor responsible for the oil

change will document the volume of oil generated from each site. The Operations Manager, or his designate will confirm this when the used oil is returned to the staging point. Maintenance technicians will be provided with sealable oil collection pans with adequate capacity to store the volume of used oil anticipated from the site or sites prior to turn in at the staging point. It is estimated that approximately 5-10 litres of used oil will be taken from each generator on a quarterly basis. By documenting the volume of used oil produced at each site, MSI management can determine if and when a generator requires servicing, and possibly minimise the impact of air emissions.

A low technology option may be the use of treatment chemicals to remove ash and metals so that the oil can become useful as a bunker oil suitable for combustion. Such an option requires minimal investment and training, and can result in the elimination of a waste and creation of a sellable commodity. This, however, will require a formal plan approved by the group COO.

### 5.1.4 Polychlorinated biphenyls (PCBs)

All new MSI electrical equipment shall be free of polychlorinated biphenyls (PCBs). An inventory shall be taken to determine which, if any, of the existing equipment owned and operated by MSI holdings contain PCBs. Warning labels shall be placed on equipment found to contain PCBs and measures initiated for the replacement and safe disposal of PCB fluids.

The safe treatment and disposal of PCB oils will require time and planning, as currently no treatment facilities exist in the African countries in which MSI holdings operate. As such, it will be necessary for the waste PCB oils to be temporarily stored prior to disposal. Prior to transport from the site to the central staging point, the storage drum must be marked with the United Nations identification number UN2315 and affixed with a hazard class 9 (miscellaneous) label. A central storage area should be provided, equipped with secondary containment with a volume capacity of 110% of the total volume of waste PCB oils. The drum(s) containing the waste PCB oils should be stored, out of the natural elements, atop a wooden pallet such that any leakage can be easily observed. Oils from other sources should not be mixed with the PCB oil, as it will add to the cost of disposal.

### 5.1.5 Ozone depleting substances (ODS)

The cooling equipment used at most MSI antenna and operations sites currently contain ozone depleting substances (ODS). According to the Montreal Protocol of 1987 ozone depleting substances, such as chlorofluorocarbons, must be phased out in developing countries by the year 2010. As such, MSI is aware and is taking efforts to initiate the conversion of the cooling systems at their existing sites prior to the deadline. This will involve a co-ordinated phase out by a team of technicians who will travel to each MSI holding to replace and recover the ODS using a recovery unit. Copies of the recovery/disposal records will be provided to each MSI holding following each ODS phase out operation. Details of the ODS phase out operation will be included in the annual environmental and social audit report.

Each holding shall ensure, through a monitoring system, that its maintenance staff do not use refrigerants containing ODS during future equipment maintenance. In order to do this, all replacement refrigerants will be purchased through an internal procurement and storage system. Replacement refrigerants will be issued on an as needed basis to the field technicians. Recovered coolant will be returned to a central staging point where the Maintenance Area Leader will confirm the volume and ensure that it is safely stored until such time as it can be properly disposed. This will limit the possibility of technicians using unauthorised materials or disposing of waste coolants in an improper manner.

## 5.2 Occupation health and safety

### 5.2.1 Workplace air quality

Air quality at the antenna sites, specifically within the enclosures, could be a health hazard to the site security guard if the exhaust systems for the generators are not well managed. During site inspections, the exhaust system for the generator will be checked to ensure that it is free of constrictions and that it does not emit particulate matter or visible gases. In addition, the security guards will be queried about the condition of the air within the enclosure. Generator exhaust emissions are dependent on fuel quality and equipment maintenance. Quantitative testing of air emissions is not a cost-effective measure during monthly inspections. However, in the event that visible emissions or complaints are received, air quality testing may be performed to determine the most appropriate action. An efficiently operated and maintained generator should reduce the potential for poor air quality on site. Therefore the maintenance schedule should be strictly enforced.

### 5.2.2 Workplace noise

No staff member or contractor should be exposed to noise levels exceeding 85 dB(A) without wearing suitable protective gear. The noise sources that could potentially create such levels are the standby generators located at many sites and offices. MSI shall perform a noise survey in and around generator rooms and other suspect locations to identify areas where noise levels exceed 85 dB(A).

Warning signs will be posted in these areas and staff provided with and trained in the use of hearing protection rated to reduce the exposure to below an acceptable standard, say 75 dB(A).

### 5.2.3 Electrocution

The threat of electrocution to maintenance staff is relatively low at antenna sites and switches. This is due to the low voltage used to operate the transmission and receiving systems. The generators, however, may have higher energy output. Lockouts should be installed as necessary on all generators. In addition, maintenance technicians shall be trained in lock-out tag-out isolation procedures to minimise the risk of electrocution during equipment maintenance. Lock-out tag-out procedures should be developed specific to each holding.

### 5.2.4 Work in confined spaces

The US Occupational Safety and Health Administration (OSHA) defines a confined space as an area that:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work;

2. Has limited or restricted means for entry or exit;

3. Is not designed for continuous employee occupancy.

Underground utility vaults, sewers, manholes, pits and deep trenches (>2m) are therefore viewed as confined spaces. Prior to work being performed in confined spaces, specific observations and tests shall be performed to identify the existing or potential hazards. Such tests are designed to identify atmospheric, physical and mechanical hazards. Atmospheric hazards shall be monitored before and during entry. These include:

1. Oxygen deficiency;

2. Oxygen enrichment;

3. Presence of combustible gases;

4. Presence of toxic gases.

As an added precaution, maintenance technicians shall be instructed to ventilate the confined space prior to and during the entry. This should allow for adequate ventilation in the event that one or more of the conditions listed above exist. The confined space checklist and procedural flow diagram are provided in **Annex B**.

### 5.2.5 Hazardous material handling and storage

Each holding is responsible for ensuring that its contractors comply with safety regulations. This is applicable to fuel contractors during delivery operations. In addition, UN hazard labels for Class II flammable materials shall be posted on all storage tanks and outside the generator containers.

MSI's fuel handlers and/or fuel contractor shall have in place documentation and safety procedures that they will follow during fuel delivery operations. These procedures should include:

1. Position the tanker to allow for the rapid evacuation in forward gear;
2. Display a warning triangle if the vehicle is liable to block traffic;
3. Switch off the engine, lights and all other electrical apparatus;
4. Close windows of the truck and ensure that there are no open ignition sources in the area;
5. Disconnect battery circuit by depressing the battery cut out switch;
6. Place the fire extinguisher within reach of the delivery point (5 m);
7. Ensure that there is enough free capacity in the AST to receive the product;
8. Ensure that the cap for the fill pipe to the AST is securely sealed;
9. Check the condition of the product delivery hose for holes and proper fittings.

In addition to the above, the fuelling contractor shall be required to comply with the following:

1. Provide a drip pan below any elevated fill port to contain drips and small spills of product;
2. Earth the tanker to the connection provided at each site;
3. Have available an adequate supply of a suitable absorbent material to clean spilled product.

Following each fuel delivery, the authorised MSI attendant shall confirm that the above procedures have been followed. The fuel contractor shall complete a product transfer receipt that will be signed by the MSI attendant. A copy of the receipt will be maintained in the site project file for future reference.

### 5.2.6 Radio frequency

It is necessary to take preventive measures to protect maintenance technicians from accidental exposure, as the effect of continuous contact with ionising fields such as may exist in microwave signals is not currently known with certainty. MSI does not allow technicians to mount the antenna towers or work on the cells or transmitter/receivers while the system remains energised. Lock-out tag-out procedures include disconnecting and locking out the energy source prior to ascending the towers. During overhead operations, one maintenance technician must remain on the ground to supervise and assist the technician who ascends the tower. The technician on the ground is there to offer technical support, to provide emergency assistance, and to guard against unauthorised persons entering the site and possibly re-energising the works. In addition, all maintenance technicians will be trained to the awareness level on the effects of RF radiation and methods to avoid exposure.

### 5.2.7 Mechanical hazards

The generators at each antenna site are equipped with locks to prevent the accidental charging of the system while technicians are working on site. Mechanical equipment at other MSI sites, such as offices, depots, etc, shall be checked and equipped, where lacking, with lock-out devices to be utilised during maintenance activities.

## 5.3 Monthly site inspection criteria

MSI maintenance technicians perform routine site inspections to service and make necessary repairs to the transmitting/receiving equipment. In addition to this, maintenance technicians shall inspect and document the following issues during each site inspection:

1. Physical environment;
2. Condition of generator;
3. Condition of fuel storage tank and containment bund;
4. Fire extinguisher certification and usability;
5. Biological environment;
6. Social and cultural issues;
7. Solid and liquid waste management;
8. Safety conditions, equipment, etc.

Monthly Site Maintenance Forms shall be completed during the site inspections. The forms, provided in **Annex B**, include checklists of health and safety equipment and measures, and environmental conditions to assess during the monthly site inspections. The site assessment sheet will be completed by the Maintenance Technician and reviewed by the Maintenance Area Leader, who will also perform random site audits to confirm that environmental conditions are maintained. The maintenance technicians shall also maintain copies of the site assessment sheets to be reviewed for comparison during future site inspections.

## 5.4 Site safety procedure

A general site safety procedure is to be followed during all site construction and maintenance activities. In addition to the general procedure, specific procedures for tower, roof and confined space safety must be followed. In addition, a Safety Equipment Checklist (O&M_06) must be completed as part of every site maintenance activity. These safety procedures are provided in Annex B.

It is an integral part of any safety program that documentation takes place as soon as possible following a safety incident so that the cause and means of prevention can be identified to prevent a recurrence (FR, 1994). In the event that an employee falls or there is some other incident involving injuries, the Tower Safety Procedure (O&M_03) and/or Roof Safety Procedure (O&M_04) shall be reviewed to determine the need for additional equipment, procedures or training. A similar review should follow any serious incident occurring in a confined space (O&M_05). This should prevent similar types of falls or incidents from occurring in the future.

## 5.5 Organisational structure and responsibilities for site operation

The Maintenance Technicians will submit all completed site maintenance reports to the Maintenance Supervisor, who will review them and report any problems or issues to the Operations and Maintenance Manager. Any and all corrective actions will be discussed with

the Operations Director and Environmental Officer, who is responsible for the EHS issues related to the operation of each MSI network (**Figure 1**).

An internal audit program will be implemented to ensure that environmental conditions at MSI sites are maintained. As part of the audit program, the Environmental Officer will review the monthly site maintenance forms to identify any changes in the physical and safety conditions at each site. The Environmental Officer must visually inspect all sites where environmental issues have been identified. Based on this inspection, a summary report shall be submitted to the Operations and Maintenance Manager and Chief Technical Manager. The report will suggest corrective actions to eliminate or minimise the identified issue. All documentation shall be stored in site specific files and included in the annual environmental and social audit report.

In addition to the above, the Maintenance Area Manager will be required to perform random audits of 25% of the sites per year. The audit will involve a review of the monthly site inspection forms, followed by site reconnaissance visits to visually confirm that site conditions are consistent with those described in the monthly site EHS maintenance forms. As above, a brief summary statement will then be submitted for review by Operations and Maintenance Manager and Chief Technical Manager, and maintained in the site file.

# 6 ENVIRONMENTAL IMPACT ASSESSMENT CRITERIA

## 6.1 Legal environmental requirements

Below are outlined the necessary procedures that MSI will follow, unless otherwise required by national or local regulations, prior to initiating a network roll-out in game parks, reserves or other areas determined to be ecologically sensitive. The EIA process includes three parts; preparation of a project development plan, an environmental impact assessment (EIA) and an EIA review and approval. These are described in the following sub-sections.

### 6.1.1 Project development plan

Upon determination of a candidate site located in game parks or reserves, as well as those in areas that meet the criteria as ecologically sensitive (refer to Section 3.2.2), the Site Acquisition Group Leader will prepare a development plan describing the proposed development and submit it to the environmental authority. The project development plan shall include:

1. A description of the proposed activity;
2. Anticipated construction methods to be employed;
3. Specifications of the works (i.e. number, height, land requirements, locations, etc);
4. The likely impact of the activities on the environment and socio-economy as well as proposed mitigative measures;
5. Number of people to be employed (construction, operation); and
6. Anticipated operational activities.

The appropriate departments within the environmental authority will review the proposal to determine the need and extent of an EIA. The authority will determine whether the project is one that is likely to have a significant impact on the environment for which an EIA is required. MSI should consult with the relevant authorities and local experts (i.e. national park service, ecologists, etc) early in this process to assist in selection of suitable antenna site locations within the national parks and reserves.

### 6.1.2 Environmental impact assessment

In the event that an EIA is required, MSI will contract a registered or approved consultant to perform the assessment(s), based on the terms of reference agreed upon with the environmental authority. Unless otherwise specified by the environmental authority, the EIA will comply with the IFC Operational Policies on Environmental Assessment, and be performed prior to initiating construction activities.

The EIA process is likely to require several months to complete, as it requires regulatory interaction and a period to allow for public review and comment on the draft EIA report. Therefore an adequate period of time should be allowed.

### 6.1.3 EIA review and approval

It is encouraged, albeit not required, that a local expert be solicited for input and comments to the draft report. This may ensure that the EIA is comprehensive and applicable. Such experts might include a university professor of environmental science or ecology. Upon completion of the draft EIA, copies of the report shall be submitted to the MSI Chief Operating Officer for his input prior to submitting the final report to the environmental authority for approval.

## 6.2 Organisational structure and responsibilities for EIA process

The Site Acquisition staff will be responsible for initiating the EIA process through its review of the EHS site acquisition assessment form prepared by the radio engineer. The chain of responsibility shall be consistent with that described in Section 3.3, with the Site Acquisition Group Leader responsible for implementation of the EIA process and the Environmental Officer having ultimate authority regarding decisions (**Figure 1**).

# 7 SOCIAL AND CULTURAL POLICIES AND PROCEDURES

## 7.1 Corporate Policy on HIV/AIDS

As a major investor in Africa, a continent that has been particularly impacted by HIV/AIDS, MSI is in a position to offer more than just jobs and cellular communications. MSI is dedicated to help spread awareness and thereby assist in the prevention of further infections. MSI is aware of and sympathetic to the medical, economic and social impact that HIV/AIDS can have on an individual, company and society. As an employer and member of society, it is in MSI's interest, as well as the interest of the countries in which MSI operates, to assist, through establishing partnerships with HIV/AIDS related charities, sponsorship of advertising campaigns for education and awareness programs, and promoting employee awareness, education and prevention programs.

### 7.1.1 HIV/AIDS policy for applicants

MSI's management believes that should be a common objective of management and employees to strive for the reduction of new HIV infections through increased awareness and prevention and to provide care and support to those who are already infected.

Therefore MSI endorses the following (ILO, 2001):

- People with AIDS or HIV infection are entitled to the same rights, benefits and opportunities as people with other serious or life-threatening illnesses;
- Employment practices comply with local laws and regulation and/or the practices of the company, which ever is greater, and where applicable;
- Senior management unequivocally endorses non-discriminatory employment practices and education programs or information about AIDS;
- MSI will protect the confidentially of employee's medical information;
- MSI does not require HIV screening as part of pre-employment or general workplace physical examinations;
- MSI will communicate policies and practices to employees in simple, clear, and unambiguous terms; and
- MSI will provide employees with sensitive, accurate and up-to-date information about risk reduction in their personal lives. This will include providing workplace education addressing prevention, care and support; training on universal precautions as detailed by the World Health Organization; and a regular and confidential access to condoms for all staff.

MSI's Goal regarding HIV/AIDS is that employees will work together to develop Action Plans for implementing this employee HIV/AIDs policy. An MSI HIV/AIDS Committee should be created and establish a program to achieve the ultimate goal: to prevent the increase of HIV/AIDS prevalence among staff of MSI and their families.

The purpose of the program is to increase the adoption or use of HIV/AIDS prevention behaviours among the staff of MSI as well as their families and surrounding communities.

The program will therefore focus on:

- Increased knowledge on the modes of transmission of HIV/AIDS;

- Improved attitudes regarding risk perception, fostering social support for the use of HIV/AIDS prevention behaviours, e.g. use of condoms.

MSI and its holdings should establish program objectives for each Fiscal Year. These could be as follows:

1. Education of employees;
2. Distribution of condoms;
3. Discouraging discrimination;
4. Encouraging behavioural changes;
5. Training of peer educators group; and
6. Commemorate World AIDS Day on December 1st.

### 7.1.2 Employment criteria regarding HIV/AIDS

It is unethical and, in many countries illegal, to discriminate against a prospective employee because he/she may have HIV/AIDS. However, MSI and its holdings require pre-employment and annual physical examinations for all staff positions. The physical exams are provided to all field staff as a means of establishing their baseline physical conditions and for monitoring the potential effects from job related activities. In order to avoid discrimination or the perception of discrimination, the minimum criteria for passing the physical examinations will be documented and provided to the applicant upon request. In addition, the following criteria should be maintained:

1. Ensure that the testing process is as non-intrusive as possible. Personal modesty, dignity and privacy must be protected.
2. Test results should be used solely for the purpose of determining a candidate physically capable to perform the job.
3. Procedural justice must be maintained by utilising only qualified testing labs and by closely monitoring the chain of custody of samples (Hill, 1997).

To go along with this, MSI must establish the physical exam methodology and quantified passing standards for each group of staff positions (i.e. field, admin, etc), or make a general policy statement and allow each holding to add the details, provided that they meet or exceed the group base standard.

### 7.1.3 HIV/AIDS program for existing staff

MSI invests time and financial resources in training technical staff. As such, it is in MSI's interest to provide a non-intrusive health program that includes HIV/AIDS awareness and medical assistance. As part of this program, the annual physical exams described in section 7.1.2, above, will be provided to all staff as a means of monitoring the potential effects from job related activities.

In addition, MSI will provide a voluntary HIV/AIDS counselling and testing program (VCT). Employees and their spouses/partners should be encouraged to know their status. VCT offers the possibility of changing risk behaviour and effectively targeting and preventing opportunistic infections that increase with HIV/AIDs infections. The HIV exam results are purely for personal awareness and must remain confidential between the employee and doctor.

MSI will establish an employee protection program that includes awareness training, prevention programs, counselling and a fund to assist HIV positive staff in the payment of AIDS antiviral medication. Local HIV/AIDS demographic data should be used to estimate the

annual costs for the antiviral assistance program. It will be up to the individual employees to initiate their involvement in the program. The purpose of the VCT program is to maintain confidentiality and to not allow the health of HIV positive employees to degenerate to an unproductive level. If an employee is productive on the job, then he/she is likely to also be productive in society. The VCT program includes financial assistance for drug treatments, primary medical care and essential supportive services.

## 7.2 Retrenchment policy and procedures

MSI is a relatively young, growing company that has not undergone retrenchment activities. However, the possibility exists that retrenchment may be necessary in the future. In the event that such a condition becomes necessary, the subject holding company must prepare a retrenchment plan and submit it to the Human Resources Officer for review. The MSI Legal Counsel should be included for their input. Once the plan is approved, it then will be presented to the Chief Operating Officer for final approval prior to initiation of the program. An outline for the required retrenchment plan (HR_02) is presented in Annex C. Under no conditions may an MSI holding initiate staff retrenchment activities without first obtaining the approval to do so from the Chief Operating Officer. In addition, full documentation of the retrenchment activities must be maintained, as described in the retrenchment plan outline.

## 7.3 Policy regarding harmful child labour

Companies operating in Africa commonly employ informal labourers to fill unskilled positions. This is especially common where trenching and shallow excavations are required. In economically depressed countries, many children are forced into the labour force. Despite this, MSI will not employ persons below the legal age limit of 16 years, as determined by Dutch law, unless the minimum age limit defined by the host country is lower (ILO, 1973). When employing informal labourers, site supervisors will be required to document names and ages by checking national identification cards prior to hiring. This information must be filed with other site specific information.

## 7.4 Organisational structure for social policy implementation

The Managing Director of each holding will be responsible for establishing and implementing all social policy and procedures, with assistance by the Environmental Officer. Technical support should be sought through the group human resources department.

# 8 SUMMARY

This ESMP outlines the procedures that MSI staff and management are to take regarding the selection, construction, operation and maintenance of their telecommunications networks.

## 8.1 Site Selection

Site reconnaissance visits will be made to each potential development site. Issues to be considered in the selection process will include:

1. Current land use;
2. Physical conditions;
3. Existing infrastructure;
4. Adjacent land use;
5. Social, historical and cultural issues; and
6. Biological conditions.

The above listed issues will be qualitatively evaluated for each candidate site and presented, along with recommendations, to the appropriate officers to aid in site selection. This phase may also initiate the EIA process if necessary.

## 8.2 Construction

The MSI Construction Supervisor will ensure that the environmental, health and safety conditions for the construction contractor are included in the contract agreement and implemented. Weekly Construction Monitoring Sheets will be completed, documenting site activities and conditions. These will be submitted to and reviewed by the Operations Manager.

In the event of an accident or near accident, the Environmental Officer will investigate the incident by completing an Incident Report Form (HR_01 in Annex C). This will document the details of the incident, identify the cause and recommend corrective measures to avoid recurrence. Copies of the completed report will be submitted to the MSI Group Environmental Officer, Human Resources Officer, and placed in the project file. The Group Legal Counsel should be notified in the event of death or debilitating injury.

## 8.3 Operation and maintenance

MSI maintenance technicians will perform monthly maintenance inspections at antenna sites, switches and associated works. For every site visit, the maintenance technician will inspect the environmental, health and safety conditions by completing a Site Maintenance Form (O&M_02 in Annex B). Issues addressed include:

1. Physical environment;
2. Condition of generator and management of waste fluids;

3. Fuel transfers and storage tank condition;

4. Biological environment;

5. Social and cultural issues;

6. Solid and liquid waste management; and

7. Health and safety.

Substandard EHS issues identified during the site inspections will be brought to the attention of the Operations Manager, who will initiate corrective actions through the organisational structure outlined herein.

## 8.4 EIA procedures

Upon selection of development sites in game parks and reserves, as well as those that are determined to be in ecologically sensitive areas, the Site Acquisition Group Leader will initiate the EIA procedures outlined in Section 5. This will allow the applicable environmental authorities adequate time to review the proposed project and make decisions based on the appropriate course of action and the details required for a possible EIA. MSI will comply with all applicable regulations and standards, as determined in this phase of the development.

## 8.5 Social and cultural policies and procedures

MSI and its holdings shall initiate HIV/AIDS employee protection programs that include voluntary HIV/AIDS counselling and testing, awareness training and AIDS drug assistance. In addition, MSI will not discriminate against any person, employee or applicant, on the basis of their HIV/AIDS status.

Prior to undertaking any retrenchment activities, a retrenchment plan must be prepared by the subject holding. The plan must be reviewed and approved by the MSI Chief Operating Officer prior to initiation of retrenchment activities. The required components of a retrenchment plan are described herein.

## 8.6 Annual audits and reporting

Internal EHS audits will be performed during all phases of network roll-out and operation. In addition, the Environmental Officer for each holding shall prepare an annual environmental and social audit report, comprising of a summary of the data documented during monthly inspections. Copies of the annual audit report shall be presented to the MSI board of directors as part of their annual meeting.

The annual audit shall include, as a minimum:

1. A review of a representative number of site environmental files;

2. Site inspections to a selected number of sites, proportional to site categories, to confirm that environmental conditions are as described in the monthly site maintenance forms, and that the necessary corrective actions have been undertaken and are successful;

3. Inspection of adjacent properties;

4. Review and update, as necessary, figures and drawings of sites and surrounding areas;

5. Performance of quantitative air, noise, or other surveys as necessary based on identified issues;

6. Evaluation of the effectiveness of this ESMP and suggestions to improve environmental stewardship; and

7. Preparation of a standard report detailing the findings.

## 8.7 Training requirements

MSI shall provide in house introductory training for implementation of this ESMP. In addition, climbing safety, electrical safety, RF radiation awareness, environmental and cultural heritage values, confined space entry procedures and lock-out tag-out isolation training will be provided to all staff involved in site selection, construction and operations. Specifically, these staff include:

1. Radio engineer(s) who will perform initial site validation and environmental assessments;

2. Site Acquisition Group Leader and support staff;

3. Construction Supervisor;

4. Site Construction Group Leader;

5. Maintenance Technicians;

6. Maintenance Area Leader;

7. Operations and Maintenance Manager;

8. Chief Technical Manager;

9. Additional staff as determined necessary to fulfil EHS job requirements; and

10. In some cases contractor staff.

In addition, annual EHS refresher training will be held to ensure that maintenance technicians remain aware of changes within the network system and that they consistently meet the requirements described herein.

# 9 REFERENCES


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**FIGURE 1**
**MSI ENVIRONMENTAL ORGANISATIONAL CHART**

**Figure 1: MSI Environmental Organisational Chart**

# ANNEX A

## Matrix of Mitigative Options

| 1 Current Land Use | Issues to Consider |
|---|---|
| a Agriculture | Costs of lost crops |
| b Rangeland | Interference with migration/grazing |
| c Commercial | Cohabitation of antenna on existing structure |
| d Industrial | Cohabitation of antenna on existing structure |
| e Residential (if yes, see 1f below) | Consensus approval from residents |
| f Will tenants require relocating? | If yes, remove from consideration |
| | |
| **2 Physical Environment** | |
| a Approximate elevation | |
| b Topography/land form | Direction of drainage |
| c Will leveling be necessary? | Cost effective, long term stability |
| d Existing structures | Interference, cost to remove |
| e Existing pollution | Future liability, cost of clean up |
| f Evidence of soil erosion | Stability of tower, effect down gradient |
| g Existing storage tanks | Future liability, cost of removal |
| h Prevailing wind direction(s) | Down wind neighbor (dust, noise) |
| | |
| **4 Adjacent land** | |
| a Location of nearest structures | Interference to transmitter, RF radiation |
| b Condition of surrounding land | Impact on site |
| c Interferring structures | Electrical safety, RF radiation |
| | |
| **5 Socio-economic & cultural** | |
| a Existing demographics | Density, lifestyle, gender/age, etc |
| b State of local economy | |
| c On/near cultural or historical sites | Minimise impact |
| d Potential land conflict evident | Future conflicts |
| e Potential visual impact | Future conflicts |
| f Customs/traditions/courtesies | Cultural protocols |
| | |
| **6 Biological Environment** | |
| a Vegetation observed | Protected species |
| b Vegetation removal required | |
| c Evidence of wild animals on/near site | Interference with dens/nesting areas |
| d Wildlife threatened by construction | Alternative work procedures |
| e Location of nearest wetland | If <100m, remove from consideration |

# Site Acquisition Environmental Assessment Sheet

**Site Name / Number** _____

**Assessor name** _____

**Assessor Signature and Date** _____

**Site Category (circle one)** Urban - Sub-urban/Rural - Park/Reserve

| Observations | Condition | | | Description | Photos |
|---|---|---|---|---|---|
| **1 Current Land use** | **Y** | **N** | **NA** | | |
| a Agriculture | | | | | |
| b Rangeland | | | | | |
| c Commercial | | | | | |
| d Industrial | | | | | |
| e Residential (if yes, see 1f below) | | | | | |
| f Will tenants require relocating? | | | | If yes, then remove site from consideration | |
| | | | | | |
| **2 Physical Environment** | | | | | |
| a Approximate elevation | | | | | |
| b Topography/land form | | | | | |
| c Will leveling be necessary? | | | | | |
| d Existing structures | | | | | |
| e Existing pollution | | | | | |
| f Evidence of soil erosion | | | | | |
| g Existing storage tanks | | | | | |
| h Prevailing wind direction(s) | | | | | |
| | | | | | |
| **3 Existing Infrastructure** | **Y** | **N** | **NA** | | |
| a Adequacy of electricity | | | | | |
| b Location of nearest power pole | | | | | |
| c Location of nearest road | | | | | |
| d Site security concerns | | | | | |
| e Interfering over/underground utilities | | | | | |
| | | | | | |
| **4 Adjacent land** | | | | | |
| a Location of nearest structures | **(Dist-Dir)** | | | If <25m, then consider another site | |
| b Condition of surrounding land | | | | | |
| c Interferring structures | **Y** | **N** | **NA** | | |
| | | | | | |
| **5 Socio-economic & cultural** | **Y** | **N** | **NA** | | |
| a Existing demographics | | | | | |
| b State of local economy | | | | | |
| c On/near cultural or historical sites | | | | | |
| d Potential land conflict evident | | | | | |
| e Potential visual impact | | | | | |
| | | | | | |
| **6 Biological Environment** | **Y** | **N** | **NA** | | |
| a Vegetation observed | | | | | |
| b Vegetation removal required | | | | | |
| c Evidence of wild animals on/near site | | | | | |
| d Wildlife threatened by construction | | | | | |
| e Location of nearest wetland | | | | | |
| | | | | | |

Reference RO_01

:e Sketch / Diagramme (include a scale)

**Comments and Recommendations**

**Reviewed by:** _____

**Signature and date:** _____

**Title:** _____

## Matrix of Construction Mitigative Measures

| Observable Impact | Mitigation Options |
|---|---|
| **Physical Environment** | |
| Surface water impacted? | Silt fence, berm, etc |
| Adeqacy of Drainage | Pump into on-site container |
| Soil erosion originating on site? | Riprap, berm, veg |
| Surface soil staining? | Drip pans, procedural modifications |
| Dust | Wetting |
| Topography/land form | |
| Excessive noise | Shielding, alter work time or procedures |
| | |
| | |
| **Biological Environment** | |
| Damaged or stressed vegetation | Procedural modification |
| Evidence of wild animals near site | Consult with local experts |
| Animal encounters on site | Review site acquisition report |
| | |
| | |
| **Waste management** | |
| Rubbish collected for disposal | Enforcement |
| Site free of rubbish | Enforcement |
| | |
| | |
| **Occupational H&S** | |
| Sanitation appears adequate | |
| Availability of water | |
| Adequacy of PPE | |
| Injuries or accidents reported | Address cause and adjust |
| | |

Reference RO_02

# Weekly Construction Supervision Form

**Site Name / Number** _____

**Assessor name** _____

**Assessor signature and date** _____

**Description of Works:** _____

_____

_____

**Weather conditions:** _____

_____

**Contractor(s) on site:** _____

| Observable Impacts | Condition | | | Description |
|---|---|---|---|---|
| **1 Physical Environment** | **Y** | **N** | **NA** | |
| a Surface water impacted? | | | | |
| .deqacy of Drainage | | | | |
| c Adequacy of erosion barriers? | | | | |
| d Surface soil staining? | | | | |
| e Dust generation | | | | |
| f Topography/land form | | | | |
| g Excessive noise | | | | |
| | | | | |
| | | | | |
| **2 Biological Environment** | **Y** | **N** | **NA** | |
| a Damaged or stressed vegetation | | | | |
| b Evidence of wild animals near site | | | | |
| c Animal encounters on site | | | | |
| | | | | |
| | | | | |
| **3 Waste management** | **Y** | **N** | **NA** | |
| a Rubbish collected for disposal | | | | |
| b Site free of rubbish | | | | |
| c Disposal of excavated soils | | | | |
| | | | | |
| **4 Occupational H&S** | **Y** | **N** | **NA** | |
| a Sanitation appears adequate | | | | |
| b Availability of water | | | | |
| c Adequacy of PPE | | | | |
| d Injuries or accidents reported | | | | If yes, include completed HR report |
| | | | | |

**Site Sketch: if necessary (include a scale)**

**Additional Comments:**

**Reviewed by:**

**Signature and date:**

**Title:**

# ANNEX B

# Site Maintenance Form

**Site Name / Number** _____

**Assessor name** _____

**Assessor signature and date** _____

| Observations | Condition | | | Description / Cause | Corrective actions |
|---|---|---|---|---|---|
| **1 Physical Environment** | **Y** | **N** | **NA** | | |
| a Surface water impacted? | | | | | |
| b Adeqacy of Drainage | | | | | |
| c Soil erosion originating on site? | | | | | |
| d Surface soil staining? | | | | | |
| e Dust | | | | | |
| f Topography/land form | | | | | |
| g Standing water on site | | | | | |
| | | | | | |
| **2 Genset** | **Y** | **N** | **NA** | | |
| a Operational | | | | | |
| b Visual air pollution from genset | | | | | |
| c Oil change | | | | | Vol used/recovered |
| d Noise level outside fence | | | dB(A) | | Full survey if >40 dB(A) |
| e Previous hours | | | Hr | | |
| f Current hours | | | Hr | | |
| g Total hours since last inspection | | | Hr | | |
| h Previous fuel level | | | L | | |
| I Current fuel level | | | L | | |
| j Fuel delivered (Volume) | | | L | | |
| k Calculate fuel efficiency | | | L/Hr | | |
| l Fuel tank in good condition | | | | | |
| m Evidence of fuel spills | | | | | |
| | | | | | |
| **3 Biological Environment** | **Y** | **N** | **NA** | | |
| a Stressed vegetation observed | | | | | |
| b Evidence of wild animals near site | | | | | |
| c Evidence of wild animals on site | | | | | |
| | | | | | |
| **4 Waste management** | **Y** | **N** | **NA** | | |
| a Site free of rubbish | | | | | |
| b Rubbish collected for disposal | | | | | |
| c Surrounding area free of rubbish | | | | | |
| | | | | | |
| **5 Occupational H&S** | **Y** | **N** | **NA** | | |
| a Sanitation appears adequate | | | | | |
| b Availability of water | | | | | |
| c Adequacy of safety equipment | | | | | |
| d Tower platform/ladder adequate | | | | | |
| e Fire extinguisher operational | | | | | |
| | | | | | |
| **6 Air cooling system** | **Y** | **N** | **NA** | | |
| a Functioning properly | | | | | |
| b Gas type | | | | | |
| c Replacement necessary | | | | | Use non-CFC gas |

(Reference O_01)

**Site Sketch: (include a scale)**

**Additional Comments:**

**Reviewed by:**

**Signature and date:**

**Title:**

(Reference O_01)

| Operation & Maintenance | Safety Procedures |
|---|---|

| Reference O&M_02 | General Safety Procedure | Update 20/05/02 |
|---|---|---|
| 1/1 | Author: C Brooks — Owner: Omari Issa | Version 1.0 |

## Procedural objective

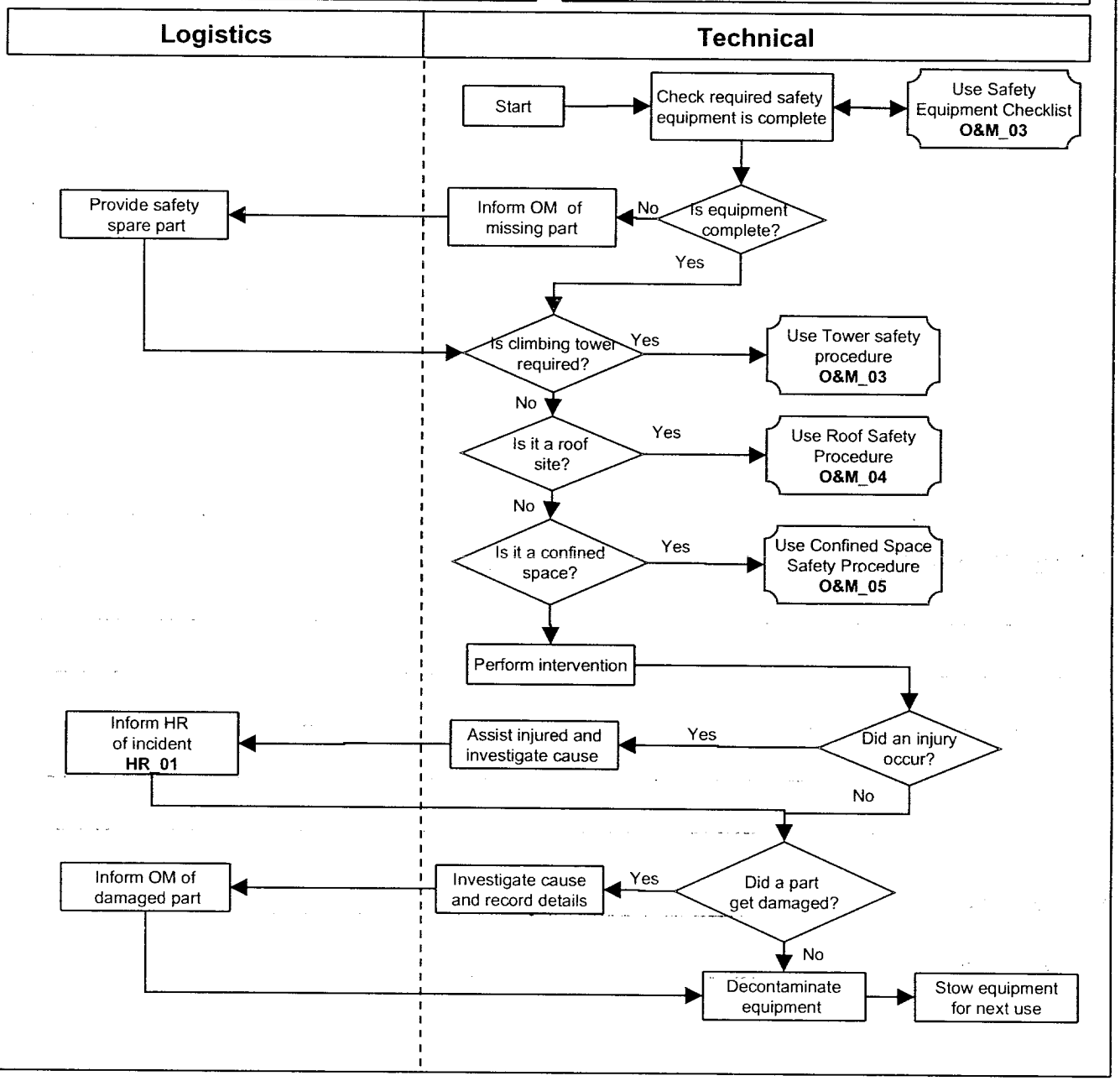
⇨ This procedure describes the safety measures that must be taken regarding an intervention on site.

## Conditions

⇨ Safety equipment provided to all the technicians
⇨ Technicians trained to safety measures & rules

## Application field

⇨ Maintenance intervention on site



| List of tasks | | | | | |
|---|---|---|---|---|---|
| **Name of Process: General Safety Procedure** | | | | | **Last update: 20/05/02** |
| **Reference: O&M_02** | | | | | **Version: 1.0** |
| | **Task** | **Support Grp** | **Comments** | **Documents (in/out)** | **IT tool/Tools** |
| 1 | Check required safety equipment | Technical | Before an intervention, the maintenance technician must have all required safety equipment. | **O&M 06** Safety Equipment Checklist | |
| 2 | Is equipment complete | Technical | Record delinquencies | **O&M 06** Safety Equipment Checklist | |
| 3 | Inform OM of missing part | Technical / Logistics | Contact OM to provide replacement part(s). | | |
| 4 | Provide safety spare part | Logistics | The OM should determine the reason for the missing part prior to providing spare part. | | |
| 5 | Is climbing tower required? | Technical | If an intervention involves climbing a tower, there must be someone assisting on site. | Follow **O&M_03** Tower Safety Procedure | |
| 6 | Is it a roof site? | Technical | If an intervention is on a roof, there must be someone assisting on site | Follow **O&M_04** Roof Safety Procedure | |
| 7 | Is it a confined space? | Technical | If an intervention is in a confined space, there must be someone assisting on site | Follow **O&M_05** Confined Space Safety Procedure | |
| 8 | Perform intervention | Technical | Perform necessary repair and update the Site Maintenance Form accordingly. | **O&M_01** Site Maintenance Form | |
| 9 | Did injury occur? | Technical | Record details | **HR_01** Human Resources Accident Report | |
| 10 | Assist injured and investigate cause | Technical / Human Resources | Assist injured party and investigate cause | | |
| 11 | Inform HR of incident | Technical / Human Resources | Notify HR at earliest possible time | | |
| 12 | Did part get damaged? | Technical / Logistics | Record details | | |
| 13 | Investigate cause | Technical | | | |
| 14 | Inform OM of damaged part, | Technical / Logistics | Submit part to OM | | |
| 15 | Decontaminate equipment | Technical | Remove gross contamination and sanitise as necessary | | |
| 16 | Stow gear for next use | Technical | | | |

# Technical Department

## Operation & Maintenance | Safety Procedures

| eference O&M_03 | Tower Safety Procedure | Update 20/05/02 |
|---|---|---|
| 1/1 | Author: C Brooks / Owner: Omari Issa | Version 1.0 |

### Procedural objective

⇨ This procedure describes the minimum safety measures that must be taken when climbing a tower

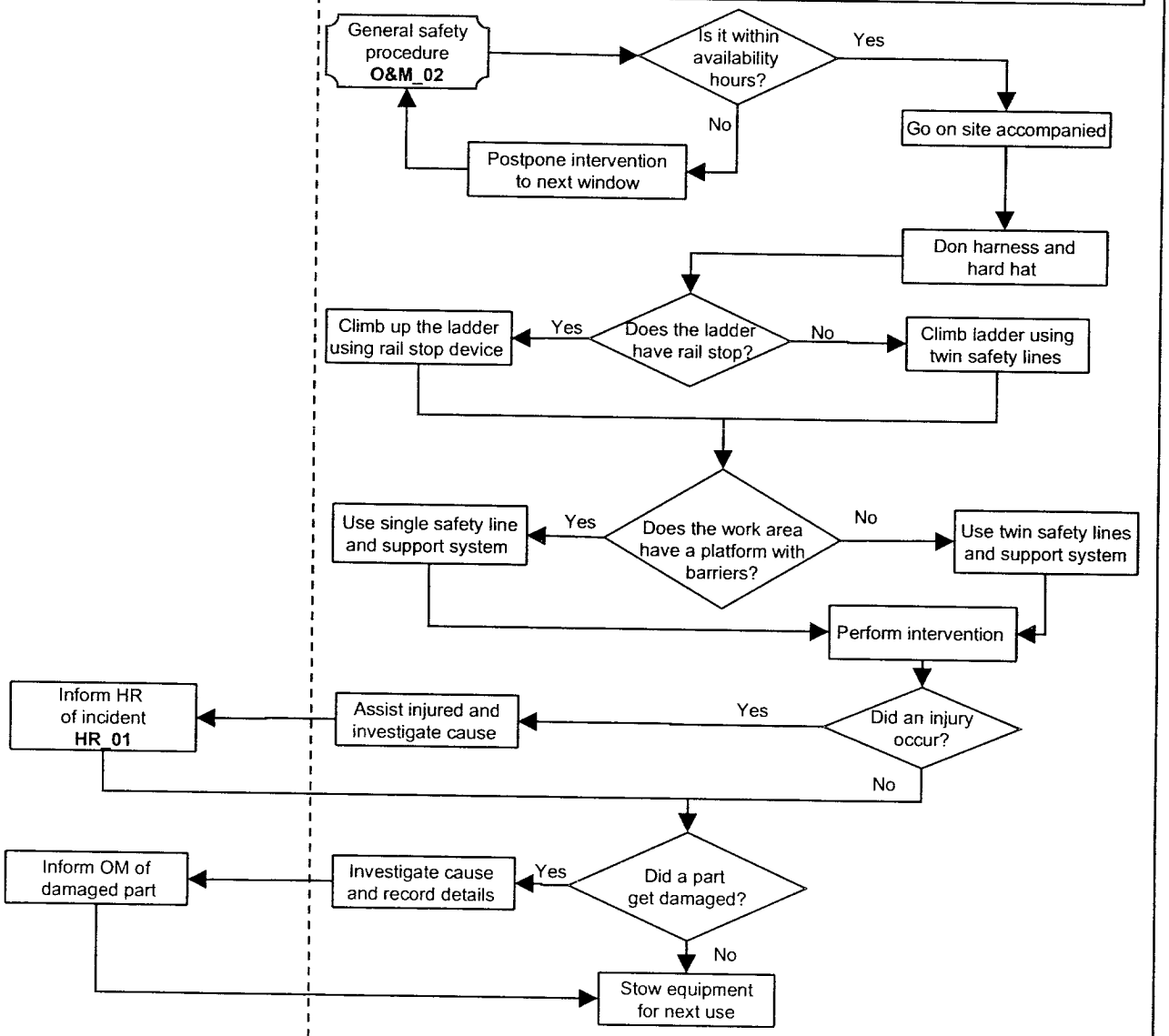
### Conditions

- ⇨ Safety equipment provided to all technicians
- ⇨ Technicians trained to safety measures & rules
- ⇨ Technician must be accompanied by another person assisting from the ground
- ⇨ Intervention availability hours (0600 to 1800 hr)

### Application fields

- ⇨ Maintenance intervention on tower
- ⇨ Maintenance intervention on roof mounted mast

### Logistics | Technical



**List of tasks**

**Name of Process: Tower Safety Procedure** **Last update: 20/05/02**

**Reference: O&M_03** **Version: 1.0**

| | Task | Support Group | Comments | Documents (in/out) | IT tool/Tools |
|---|---|---|---|---|---|
| 1 | Is it within availability hours? | Technical | Availability hours are from 0600 to 1800 hr | | |
| 2 | Postpone intervention to next availability hour | Technical | If answer to 1 is no | | |
| 3 | Go on site accompanied | Technical | If answer to 1 is yes, perform intervention with appropriate safety equipment and ground support. | | |
| 4 | Don harness and hard hat | Technical | Select appropriate support line and system | | |
| 5 | Does the ladder have a rail stop? | Technical | | | |
| 6 | Climb up the ladder using jumer device | Technical | If answer to 5 is yes | | |
| 7 | Climb up the ladder using twin safety lines | Technical | If answer to 5 is no | | |
| 8 | Does the work area have a platform with barriers? | Technical | Barriers include hand rails or cage | | |
| | Use single safety line and support system | Technical | If answer to 8 is yes | | |
| 10 | Use twin safety lines and support system | Technical | If answer to 8 is no | | |
| 11 | Perform intervention | Technical | Update Site Maintenance Form accordingly | **O&M_01** Site Maintenance Form | |
| 12 | Did injury occur? | Technical / Human Resources | Record details | **HR_01** Human Resources Accident Report | |
| 13 | Assist injured and investigate cause | Technical / Human Resources | If answer to 12 is yes, notify OM at earliest possible time | | |
| 14 | Inform HR of incident | Technical / Human Resources | If answer to 12 is yes, notify HR at earliest possible time | | |
| 15 | Did part get damaged? | Technical | Record details | | |
| 16 | Investigate cause | Technical | | | |
| 17 | Inform OM of damaged part | Technical / Logistics | Submit part to OM | | |
| 18 | Stow gear for next use | Technical | Remove gross contamination and sanitise as necessary | | |

# Technical Department

## Operation & Maintenance | Safety Procedures

| eference O&M_04 | Roof Safety Procedure | Update 20/05/02 |
|---|---|---|
| 1/1 | Author: C Brooks / Owner: Omari Issa | Version 1.0 |

### Procedure objective

- The objective of this procedure is to describe the safety measures that must be taken when climbing on a roof

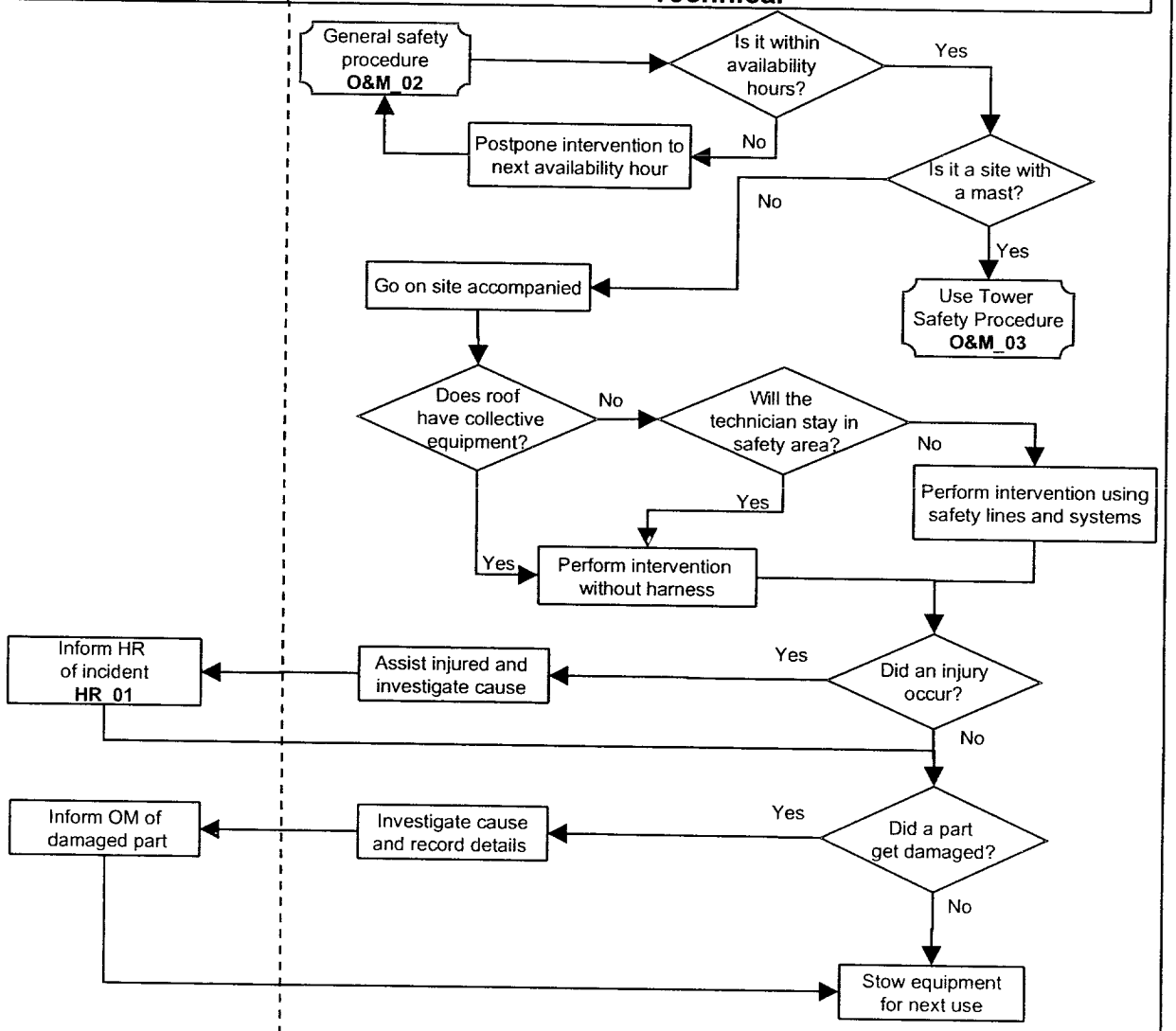
### Conditions

- Safety equipment provided to all the technicians
- Technicians trained to safety measures & rules
- Ground support must be provided
- Intervention should take place between 0600 and 1800 hr

### Application fields

- Maintenance intervention on roof mounted site

### Logistics | Technical



| List of tasks | | | | | |
|---|---|---|---|---|---|
| Name of Process: Roof Safety Procedure | | | | | Last update: 20/05/02 |
| Reference: O&M_04 | | | | | Version: 1.0 |
| # | Task | Support Group | Comments | Documents (in/out) | IT tool/Tools |
| 1 | Is it within availability hours? | Technical | Availability hours are 0600 to 1800 hr | | |
| 2 | Postpone intervention to next availability window | Technical | If answer to 1 is no | | |
| 3 | Is it a site with a mast? | Technical | | | |
| 4 | Use Tower Safety Procedure | Technical | If answer to 3 is yes | Use **O&M_02** Tower Safety Procedure | |
| 5 | Go on site accompanied | Technical | If answer to 3 is no | | |
| 6 | Does roof have collective equipment? | Technical | Barriers include raised wall, hand rails or cage | | |
| 7 | Will technician stay in safety area? | | If answer to 6 is no. Safety area is a distance of at least 2m from ledge (FR, 1994) | | |
| 8 | Perform intervention without safety lines | Technical | If answer to 6/7 is yes | | |
| 9 | Perform intervention using safety lines and systems | Technical | If answer to 7 is no | | |
| 10 | Did injury occur? | Technical / Human Resources | Record details | **HR_01** Human Resources Accident Report | |
| 11 | Assist injured and investigate cause | Technical / Human Resources | If answer to 12 is yes, notify OM at earliest possible time | | |
| 12 | Inform HR of incident | Technical / Human Resources | If answer to 12 is yes, notify HR at earliest possible time | | |
| 13 | Did part get damaged? | Technical | Record details | | |
| 14 | Investigate cause | Technical | | | |
| 15 | Inform OM of damaged part | Technical / Logistics | Submit part to OM | | |
| 16 | Stow gear for next use | Technical | Remove gross contamination and sanitise as necessary | | |

| Operation & Maintenance | Safety Procedures |
|---|---|

| Reference O&M_05 | Confined Space Safety Procedure | Update 20-05-02 |
|---|---|---|
| 1/1 | Author: C Brooks / Owner: Omari Issa | Version 1.0 |

## Procedural objective

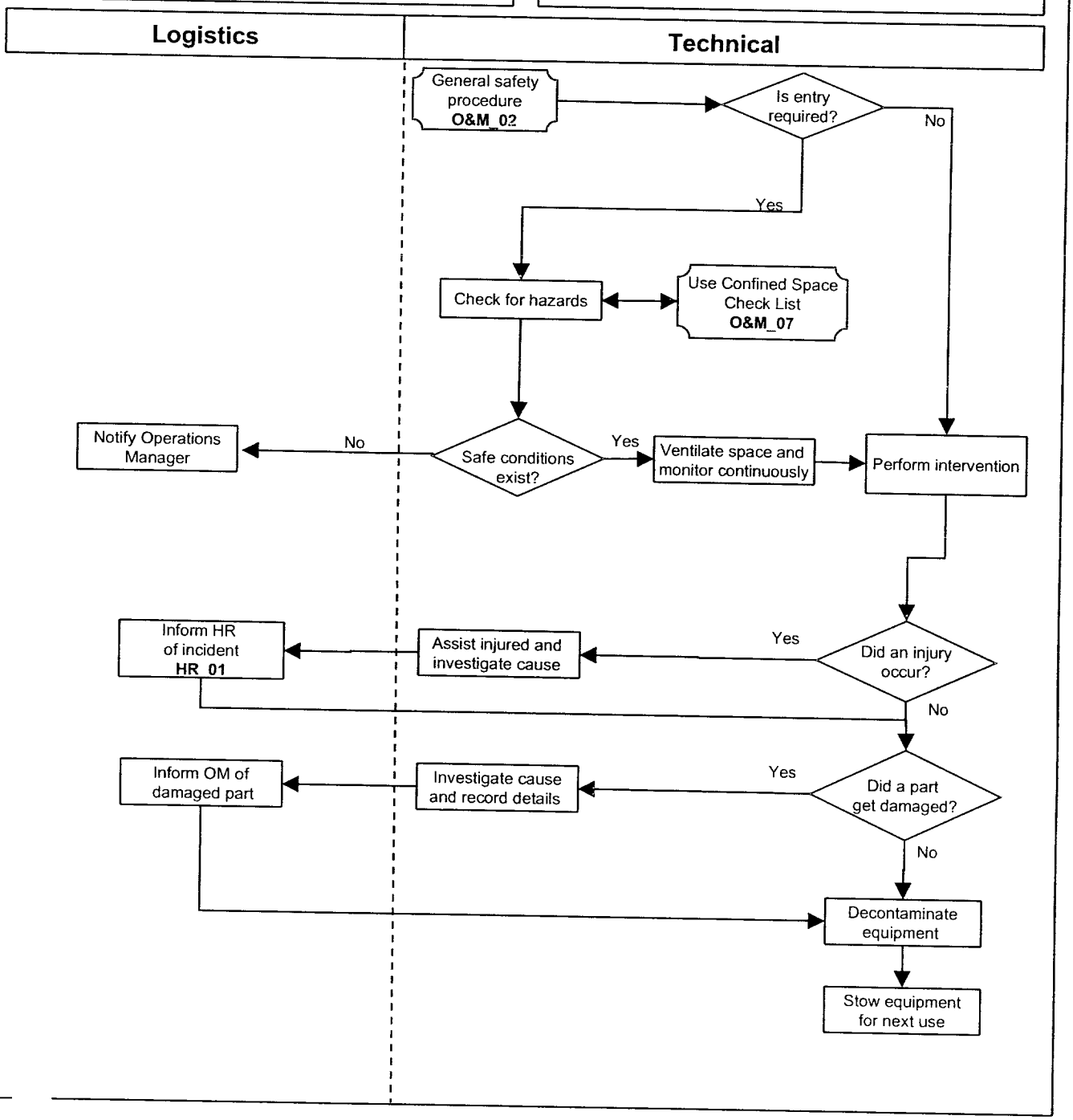
⇨ This procedure describes the safety measures that must be taken regarding an intervention in a confined space.

## Conditions

⇨ Safety equipment provided to all the technicians
⇨ Technicians trained to safety measures & rules

## Application field

⇨ Maintenance intervention in underground vault
⇨ Maintenance intervention in utility conduit/sewer



| List of tasks | | | | | |
|---|---|---|---|---|---|
| Name of Process: Confined Space Safety Procedure | | | | | Last update: 20/05/02 |
| eference: O&M_05 | | | | | Version: 1.0 |
| # | Task | Support Grp | Comments | Documents (in/out) | IT tool/Tools |
| 1 | Is entry required? | Technical | If an intervention in a confined space is required, there must be someone assisting on site. | | |
| 2 | Perform intervention | Technical | If answer to 1 is no, perform intervention and update the Field Maintenance Form | **O&M_01** Field Maintenance Form | |
| 3 | Test atmosphere in confined space using remote sensing. | Technical | If answer to 1 is yes, record atmosphere readings for O2 and LEL at top, middle and bottom of confined space | Use **O&M_07** Confined Space Check List | |
| 4 | Do safe conditions exist? | Technical | O2 levels greater than 19.5%<br>O2 levels less than 23.5%<br>LEL less than 10%<br>Free of mechanical hazards<br>Free of biological hazards | | |
| 5 | Notify OM for assistance | Technical | If answer to 4 is no | | |
| 6 | Ventilate confined space | Technical | If answer to 4 is yes, insert blower hose into bottom of confined space. Continue monitoring atmosphere | | |
| 7 | Perform intervention | Technical | Perform necessary work. Update Field Maintenance Form | **O&M_01** Field Maintenance Form | |
| 8 | Did injury occur? | Technical / Human Resources | Record details | **HR_01** Human Resources Accident Report | |
| 9 | Assist injured and investigate cause | Technical / Human Resources | If answer to 12 is yes, notify OM at earliest possible time | | |
| 10 | Inform HR of incident | Technical / Human Resources | If answer to 12 is yes, notify HR at earliest possible time | | |
| 11 | Did part get damaged? | Technical | Record details | | |
| 12 | Investigate cause | Technical | | | |
| 13 | Inform OM of damaged part | Technical / Logistics | Submit part to OM | | |
| 14 | Decontaminate equipment | Technical | Remove gross contamination and sanitise as necessary | | |
| 15 | Stow gear for next use | Technical | | | |

**Prior to entry:**

**Review site health and safety plan (HASP):**

- Identify the potential hazards involved (ie CO, H2S, fire, gears, drowning, electrical, etc)
- Atmospheric testing at multiple layers of confined space
- Review actions levels for oxygen, Toxic gases and flammability
- Lockout Tagout or isolation of hazardous energy
- Discuss potential rescue situations and techniques
- Selection of PPE
- Review procedures and communications with attendants

**Perform atmospheric testing:**

- Calibrate combustible gas / oxygen meter
- Measure the top, middle and bottom layers of the confined space from a remote location (i.e. atop a vault). Remember that gases may settle, rise, or concentrate in certain areas
- Perform monitoring continuously during the intervention

**Action Levels**

Action levels to be followed are:

| LEL | | Oxygen | |
|---|---|---|---|
| Concentration | Action | Conentration | Action |
| <10% | Work | <19.5% | SCBA |
| 10-25% | Caution | 19.5-23.5% | Work |
| >25% | Evacuate | >23.5% | Evacuate |

**Support crew:**

- No entry is made without an attendant or back up crew
- 1/3 of deaths in confined space are the result of failed rescue attempts
- Specialised equipment, such as a recovery winch and harness, may be necessary depending on the confined space.

**Additional considerations:**

- LOTO may be necessary and, if so, would require compliance with the LOTO programme
- Respiratory protection, such as air purifying respirators or supplied air, may be necessary if conditions warrant. This may require outside specialist support
- Ventilation is the best protective measure and will always be used during interventions of confined spaces.

# Confined Space Checklist

**Site Name / Number** _____

**Attendant name** _____

**Signature and date** _____

**Job Description:** _____

**Purpose of entry:** _____

**Entrant name:** _____

**Weather conditions:** _____

**Time of entry:** _____ **Time of exit:** _____

| Equipment and procedures | Possess | | | Description |
|---|---|---|---|---|
| **1 PPE** | **Y** | **N** | **NA** | |
| a Steel toe safety boots | | | | |
| b Leather work gloves | | | | |
| c Chemical resistent gumboots | | | | |
| d Chemical resistent gloves | | | | |
| e Hard hats | | | | |
| f Coveralls | | | | |
| g Chemical splash suit | | | | |
| h Air purifying respirator | | | | |

| 2 Safety Equipment | Y | N | NA | Description |
|---|---|---|---|---|
| a Electric blower with hose | | | | |
| b Combustable gas meter | | | | |
| c Toxic gas meter | | | | |
| d Inherently safe torch light | | | | |
| e Recovery cable/whinch | | | | |
| f volt meter | | | | |

| 3 Atmospheric testing | Reading 1 | Reading 2 | Reading 3 | Reading 4 | Reading 5 | Reading 6 |
|---|---|---|---|---|---|---|
| a Time | | | | | | |
| b Oxygen | % | % | % | % | % | % |
| c LEL | % | % | % | % | % | % |
| d Carbon Monoxide | ppm | ppm | ppm | ppm | ppm | ppm |
| e Hydrogen Sulphide | ppm | ppm | ppm | ppm | ppm | ppm |

| 4 Safety precautions | Y | N | NA | Description |
|---|---|---|---|---|
| a Mechanical hazards? | | | | |
| b Atmospheric hazards? | | | | |
| c PPE adequate for job? | | | | |
| d Injuries or accidents reported | | | | If yes, complete **HR_01** |

Reference: O_05

# Safety Equipment Checklist

Site location: _____ Date: _____

| Equipment and procedures | Possess | | | Description |
|---|---|---|---|---|
| **1 General PPE** | **Y** | **N** | **NA** | |
| a Steel toe safety boots | | | | |
| b Leather work gloves | | | | |
| c Chemical resistent gumboots | | | | |
| d Chemical resistent gloves | | | | |
| e Hard hats | | | | |
| f Coveralls | | | | |
| g Chemical splash suit | | | | |
| h Air purifying respirator | | | | |
| i Safety glasses | | | | |
| j Hearing protection | | | | |
| k First Aid kit | | | | |
| l Fire extinguisher (ABC) | | | | |

| **2 Fall Safety Equipment** | **Y** | **N** | **NA** | **Description** |
|---|---|---|---|---|
| a Harness | | | | |
| b Fall limiter | | | | |
| c Hard hat | | | | |
| d Safety boots | | | | |
| e work gloves | | | | |
| f auxiliary safety line | | | | |

| **3 Confined Space Equipment** | **Y** | **N** | **NA** | **Description** |
|---|---|---|---|---|
| a Electric blower with hose | | | | |
| b Combustable gas meter | | | | |
| c Toxic gas meter | | | | |
| d Inherently safe torch light | | | | |
| e Recovery cable/whinch | | | | |
| f Inherently safe two way radio | | | | |
| g Traffic cones | | | | |
| h Manhole guard rail | | | | |
| i Dewatering sump pump | | | | |
| j Manhole lid prybar | | | | |

| **4 Lockout Tagout Equipment** | **Y** | **N** | **NA** | **Description** |
|---|---|---|---|---|
| a Locks | | | | |
| b Tags | | | | |
| c Volt indicator | | | | |
| d Inherently safe torch light | | | | |
| e Recovery cable/whinch | | | | |
| | | | | |

Technician Name: _____

Signature and date: _____

Reviewer signature and date: _____

Reference: (O_06)

# ANNEX C

# Accident / Incident Report Form

**ation of incident:** _____ **Date:** _____

_____ **Time:** _____

**Names of staff involved:** _____

_____

**Names of non-staff involved:** _____

_____

**Incident type:** Near accident ☐ Accident ☐

**Effects:** Equipment damage ☐ Injury ☐ Death ☐

**Medical care provided:** Yes / No **Est. value:** _____

**Staff days lost to injury:** _____ **Est. value:** _____

**Coverage time lost:** _____ **Est. value:** _____

**Description of incident:**
w sketch overleaf)

_____

_____

_____

_____

**List safety equipment used:**
(attach signed copy of O&M_06)

_____

_____

**Equipment damaged:**
(attach estimate if available)

_____ **Est. value:** _____

_____ _____

_____ _____

_____ _____

**Cause of incident:** Negligence ☐ Third party ☐ Equipment failure ☐

**Necessary corrective measures:** _____

_____

Reference: HR_01

**Sketch Scene of Incident: (include a scale)**

**Additional Comments:** _____

_____

_____

_____

_____

**Report prepared by:** _____

**Report reviewed by:** _____

**Signature and date:** _____

**Title:** _____

cc: MD, HR, Legal councel

Reference: HR_01