

## International Finance Corporation



### Environmental, Health and Safety Guidelines for

# Electric Power Transmission and Distribution

The following guidelines are applicable to electric power transmission systems and wireline installations, including receiving and transmitting stations, switches, and related equipment.

#### Right-Of-Way Alignment

The principal elements of World Bank policy regarding right-of-way alignment, land acquisition, tower erection and creation of access (e.g., roads) in otherwise inaccessible environmentally sensitive areas are summarized below. The sponsors must provide information regarding rights-of-way, their lengths, general locations and the sponsors' policies regarding alignment of these rights-of-way in relation to the following guidelines:

- a) All new rights-of-way should be aligned taking environmental factors into consideration, in a manner which will minimize to the extent possible, the need for physical alteration and the impact on sensitive natural environments, cultural resources, agricultural lands, and residential and commercial areas.
- b) Land acquisition must be carried out in accordance with World Bank resettlement guidelines which require identification and quantification of any impacts on land-based livelihood, and compensation to landowners and people relying on the land for their livelihood.
- c) Where rights-of-way are to be established through remote and currently inaccessible environmentally sensitive areas, the potential impacts on the natural environment, indigenous populations, population immigration and natural

resource exploitation must be assessed and measures adopted to minimize these impacts.

- d) Environmental impacts of proposed projects should be minimized through such measures as visual impact considerations in siting and design, restricting right-of-way use by non-authorized persons, erosion and sediment control during and after construction, and use of low-impact maintenance procedures.

#### Ambient Noise

Noise abatement measures should achieve either the following levels or a maximum increase in background levels of 3 dB(A). Measurements are to be taken at noise receptors located outside the project property boundary.

##### Ambient Noise

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

#### Solid And Liquid Wastes

- a) Project sponsors should recycle or reclaim materials where possible.
- b) If recycling or reclaim is not practical, wastes must be disposed of in an environmentally

acceptable manner and in compliance with local laws and regulations.

c) All hazardous materials, process residues, solvents, oils, and sludges from raw water, process wastewater and domestic sewage treatment systems must be disposed of in a manner to prevent the contamination of soil, groundwater and surface waters.

### **Other General Environmental Requirements**

a) Transformers or equipment containing polychlorinated biphenyls (PCBs) or PCB-contaminated oil should not be installed, and existing equipment involving PCBs or PCB-contaminated oil should be phased out and disposed of in a manner consistent with the requirements of the host country.

b) Processes, equipment and central cooling systems involving the use or potential release to the environment of chlorofluorocarbons (CFCs), including halon, should not be installed, and their use in existing processes and systems should be phased-out and disposed of in a manner consistent with the requirements of the host country.

c) Storage and liquid impoundment areas for fuels, raw and in-process materials, solvents, wastes and finished products should be designed with secondary containment (e.g. dikes, berms) to prevent spills and the contamination of soil, groundwater and surface waters.

### **Workplace Air Quality**

a) Periodic monitoring of workplace air quality should be conducted for air contaminants relevant to employee tasks and the plant's operations.

b) Ventilation, air contaminant control equipment, protective respiratory equipment and air quality monitoring equipment should be well maintained.

c) Protective respiratory equipment must be used by employees when the exposure levels for welding fumes, solvents and other materials present in the workplace exceed local or

internationally accepted standards, generally expressed as threshold limit values (TLVs).

### **Workplace Noise**

a) Feasible administrative and engineering controls, including sound-insulated equipment and control rooms should be employed to reduce the average noise level in normal work areas.

b) Plant equipment should be well maintained to minimize noise levels.

c) Personnel must use hearing protection when exposed to noise levels above 85 dBA.

### **Other Physical Agents**

a) Equipment should be designed and maintained for accepted safe working levels of physical factors that may have adverse health effects (e.g., ionizing and non-ionizing radiation, magnetic fields).

b) Work areas should be monitored regularly for radiation and field levels, and equipment integrity (e.g., protective shields, lockouts).

### **Electrocution**

a) Strict procedures for de-energizing and checking of electrical equipment must be in place before any maintenance work is conducted.

b) In cases where maintenance work has to be performed on energized equipment, a strict safety procedure must be in place and work must be performed under constant supervision.

c) Personnel training must be conducted in revival techniques for electrocution.

### **Work in Confined Spaces**

a) Prior to entry and occupancy, all confined spaces (e.g., tanks, sumps, vessels, sewers, excavations) must be tested for the presence of toxic, flammable and explosive gases or vapors, and for the lack of oxygen.

b) Adequate ventilation must be provided before entry and during occupancy of these spaces.

- c) Personnel must use air-supplied respirators when working in confined spaces which may become contaminated or deficient in oxygen during the period of occupancy.
- d) Observers/assistants must be stationed outside of confined spaces to provide emergency assistance, if necessary, to personnel working inside these areas.

### **Hazardous Material Handling and Storage**

- a) All hazardous (reactive, flammable, radioactive, corrosive and toxic) materials must be stored in clearly labeled containers or vessels.
- b) Storage and handling of hazardous materials must be in accordance with local regulations, and appropriate to their hazard characteristics.
- c) Fire prevention systems and secondary containment should be provided for storage facilities, where necessary or required by regulation, to prevent fires or the release of hazardous materials to the environment.

### **Health - General**

- a) Sanitary facilities should be well equipped with supplies (e.g., protective creams) and employees should be encouraged to wash frequently, particularly those exposed to dust, chemicals or pathogens.
- b) Ventilation systems should be provided to control work area temperatures and humidity.
- c) Personnel required to work in areas of high temperature and/or high humidity should be allowed to take frequent breaks away from these areas.
- d) Pre-employment and periodic medical examinations should be conducted for all personnel, and specific surveillance programs instituted for personnel potentially exposed to toxic or radioactive substances.

### **Safety - General**

- a) Shield guards or guard railings should be installed at all belts, pulleys, gears and other moving parts.

- b) Elevated platforms and walkways, and stairways and ramps should be equipped with handrails, toeboards and non-slip surfaces.
- c) Electrical equipment should be grounded, well insulated and conform with applicable codes.
- d) Personnel should use special footwear, masks and clothing for work in areas with high dust levels or contaminated with hazardous materials.
- e) Employees involved in climbing towers must be provided with non-slip footwear, gloves, helmets, face protection, leggings and other necessary protective equipment.
- f) Eye protection should be worn by personnel when in areas where there is a risk of flying chips or sparks, or where intense light is generated.
- g) A safety program should be established for construction and maintenance work.
- h) A fire prevention and fire safety program should be implemented and include regular drills.

### **Training**

- a) Employees should be trained on the hazards, precautions and procedures for the safe storage, handling and use of all potentially harmful materials relevant to each employee's task and work area.
- b) Training should incorporate information from the Material Safety Data Sheets (MSDSs) for potentially harmful materials.
- c) Personnel should be trained in environmental, health and safety matters including accident prevention, safe lifting practices, the use of MSDSs, safe chemical handling practices, and proper control and maintenance of equipment and facilities.
- d) Training also should include emergency response, including the location and proper use of emergency equipment, use of personal protective equipment, procedures for raising the alarm and notifying emergency response teams,

and proper response actions for each foreseeable emergency situation.

### **Record Keeping and Reporting**

- a) The sponsor should maintain records of significant environmental matters, including monitoring data, accidents and occupational illnesses, and spills, fires and other emergencies.
- b) This information should be reviewed and evaluated to improve the effectiveness of the environmental, health and safety program.
- c) An annual summary of the above information should be provided to IFC.