

Figure 2-2-3.29 33 kV T-Off Pole for ACSR

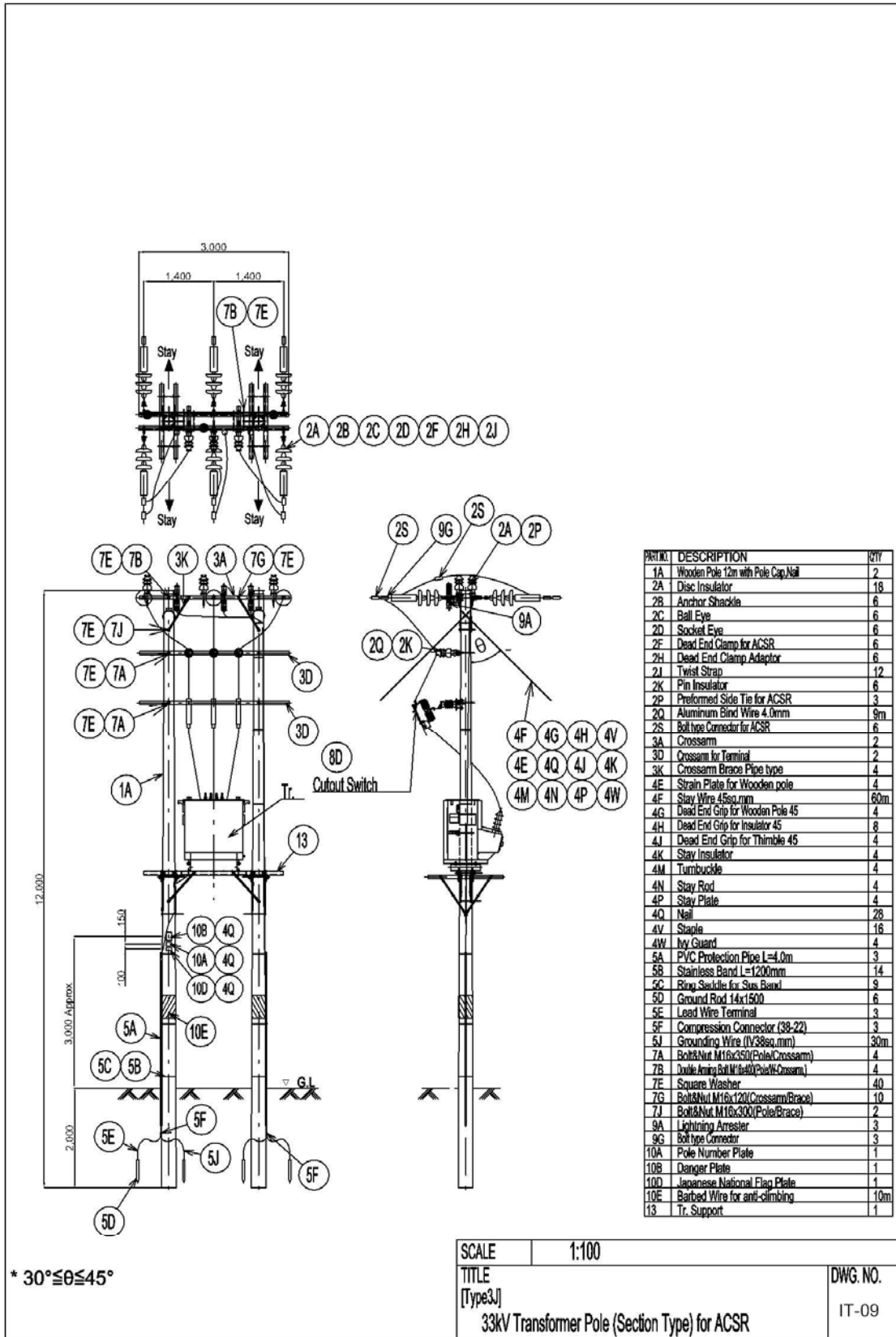


Figure 2-2-3.30 33 kV Transformer Pole (Section Type) for ACSR

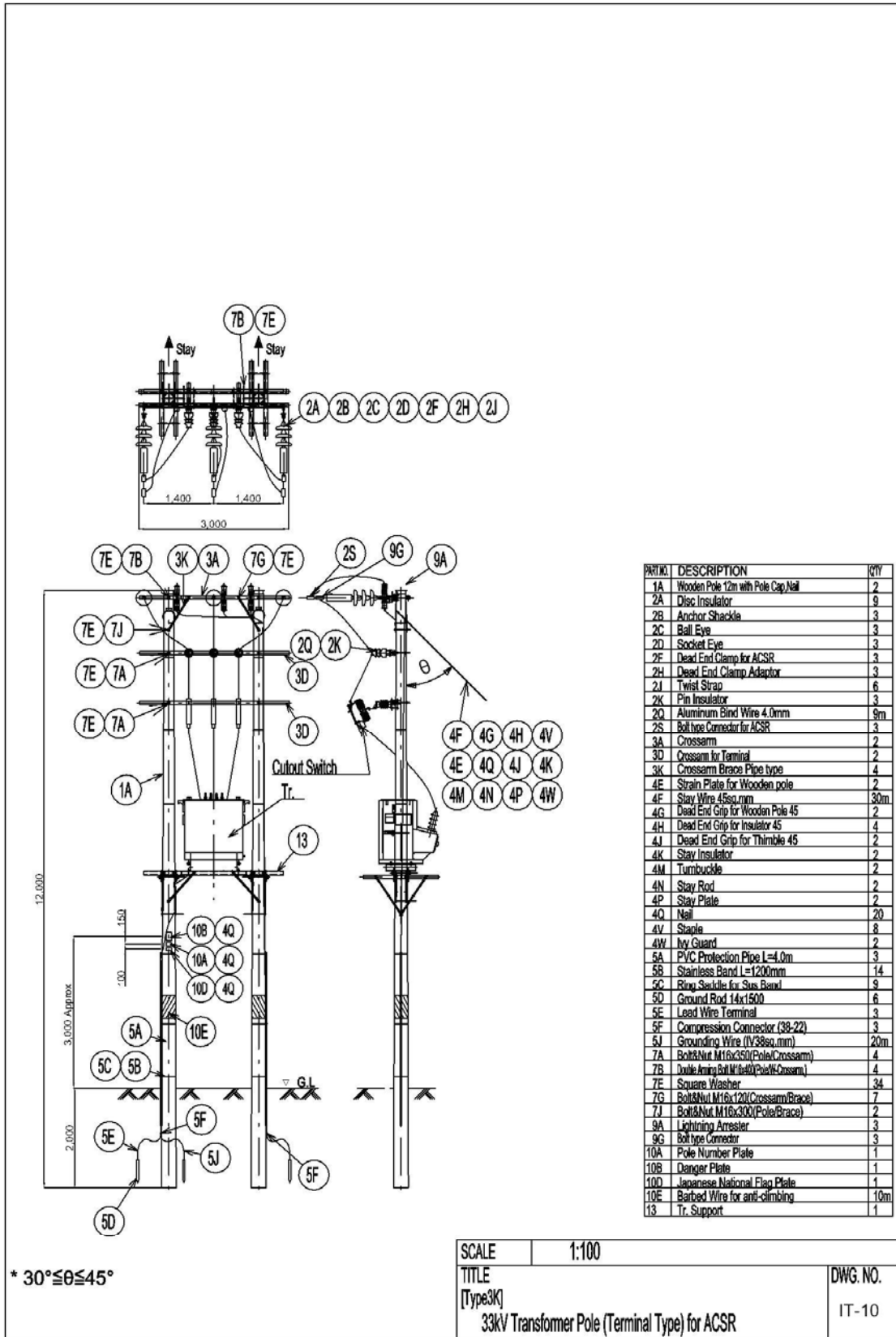


Figure 2-2-3.31 33 kV Transformer Pole (Terminal Type) for ACSR

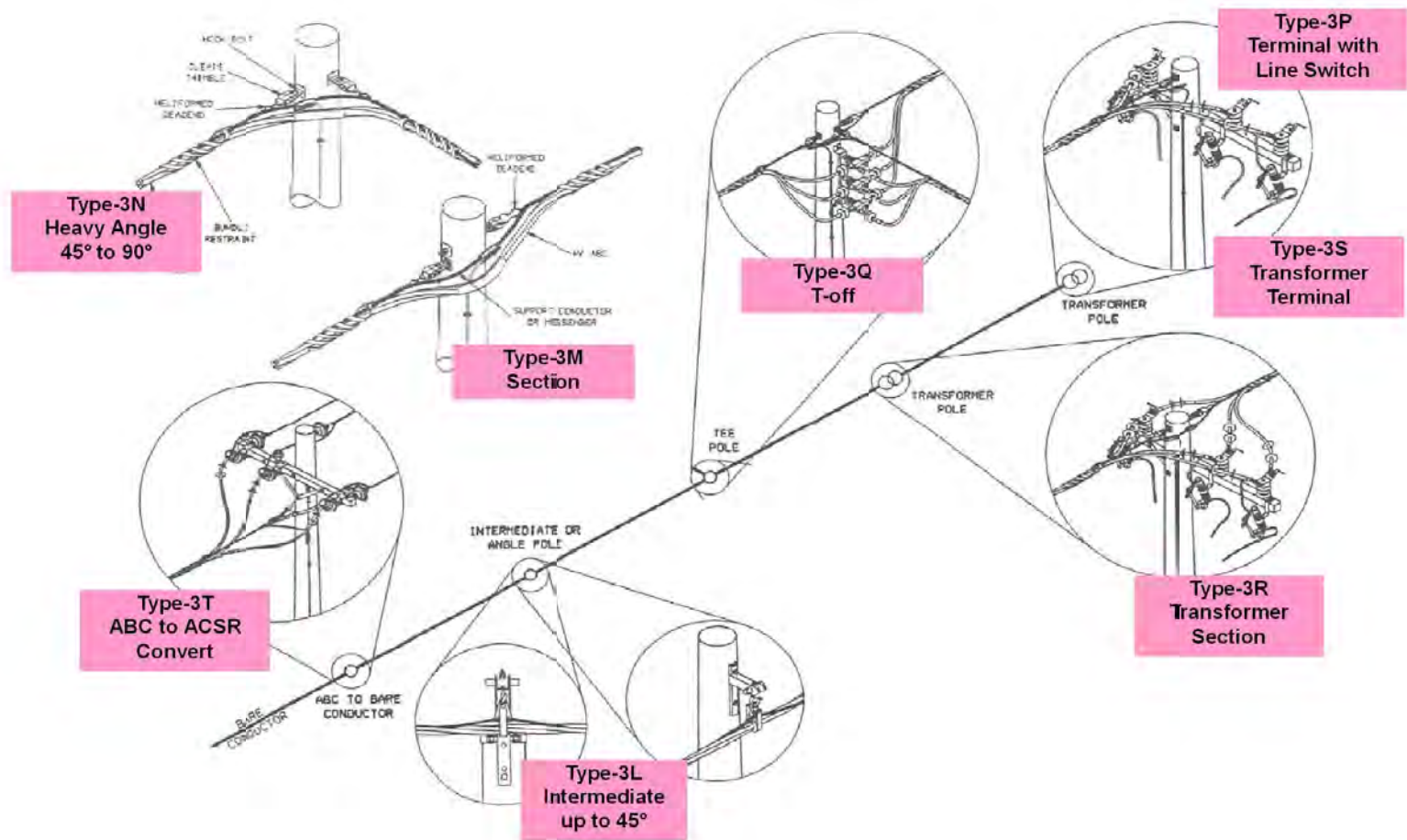


Figure 2-2-3.32 33 kV ABC Cable Distribution Line Fitting Drawings

## **2-2-4 Implementation Plan**

### **2-2-4-1 Implementation Policy**

As the project will be carried out based on the framework of Japanese grant aid, it will be implemented after the Japanese government approves the project implementation and Exchange of Notes (E/N) between the two governments and exchange of Grant Agreement (G/A) between the Japan International Cooperation Agency (hereinafter called JICA) and the Tanzanian side are completed. Below are the basic policy and points to be especially considered for the implementation of the Project.

#### **(1) Project Executing Body**

The supervising agency of the Project in Tanzania is MWCEL. After the operation of the facilities starts, operation and maintenance management will be conducted by ZECO, the executing agency of the Project. For the smooth implementation of the Project, MWCEL and ZECO need to appoint persons in charge of the Project and have close communication and discussion with Japanese consultants and contractors.

The appointed ZECO personnel in charge of the Project will have to educate the staff of MWCEL and ZECO involved in the Project and residents in the target areas so that they will have received a full explanation, have enough understanding about the details of the Project and be able to cooperate with the implementation of the Project.

#### **(2) Consultants**

For the execution of procurement and installation of equipment and materials for the Project, Japanese consultants will conduct detailed design and construction supervision under a design supervision contract with ZECO. Consultants will also create bidding documents and carry out bidding on behalf of ZECO, the executing agency of the Project.

#### **(3) Contractors**

In accordance with the framework of Japanese grant aid, contractors of Japanese nationality selected by the Tanzanian side through open bidding will carry out procurement and installation of equipment and materials for the Project.

As after-sales services such as supplying spare parts and dealing with problems will be required after the end of the Project, contractors will have to give due consideration to communication and coordination after the delivery of the equipment, materials and facilities.

#### **(4) Necessity of Dispatch of Engineers**

As this Project will be a combination of construction of substations that will involve civil engineering/construction works and installation of distribution lines in multiple sites and will require connection with existing distribution and transformation facilities, such works should be

well-coordinated. Moreover, as most of such various works will be carried out at the same time, it will be necessary to dispatch on-site supervisors from Japan who understand the scheme of Japan's grant aid and can provide management and guidance of the whole construction so that processes, quality, work progress and safety will be controlled.

## **2-2-4-2 Implementation Conditions**

### **(1) Circumstances of Construction in Tanzania and Technical Transfer**

In Zanzibar, the target area of the Project, there is no contractor who can carry out large-scale construction although there are some construction companies that carry out small-scale construction. On the other hand, in mainland Tanzania, there are some general contractors and electric construction companies. Therefore, it seems possible to procure workers, transportation vehicles, construction equipment, etc., from Tanzania and also to order general workers for the civil engineering and construction works for the construction of substations and installation of distribution lines from local vendors of the mainland of Tanzania. However, considering that this is a Japan grant aid project and it will be necessary to carry out works in multiple locations at the same time and to coordinate and manage such works in a comprehensive manner, the dispatch of Japanese engineers will be essential for process, quality and safety control.

Moreover, because installation works of transformation equipment and distribution lines are difficult and need to be successfully carried out with the minimum equipment and materials, and adjustment and tests at the time of and after installation will require engineers with expertise, it seems difficult to use local manpower other than general workers. Therefore, it is preferred that general workers and construction machinery and engineers will be locally procured and engineers will be dispatched from Japan or third countries. During the installation works Japanese engineers will also provide OJT to Tanzanian engineers to transfer techniques.

### **(2) Use of Local Equipment and Materials**

Although it is difficult to procure from Zanzibar such items as wooden poles for the work of distribution lines and aggregate, cement and iron rods for civil engineering and construction works, they can be procured from the mainland of Tanzania. Therefore, when creating a procurement plan, locally-procurable equipment and materials should be used whenever possible to foster local industries. However, as Tanzania depends on imports for the types of equipment and materials that meet the specifications required for the size of the Project and local items cannot be used, such items will be procured from Japan or third countries.

### **(3) Safety Measures**

Tanzania has fewer serious security problems than other African countries, and Zanzibar is one of the safest areas in the country. However, as Zanzibar is also the biggest tourist area in Tanzania, there may be some ordinary crimes such as theft and house breaking as well as crimes against foreigners such as pickpocketing, luggage lifting and fraud. In addition, there may be riots and demonstrations before and after an election as many residents in the region support

opposition parties. Therefore, special attention needs to be paid to the prevention of theft of equipment and materials and the safety of persons engaged in the construction. Although the Tanzanian side has to take necessary actions to provide safety, the Japanese side also needs to take safety measures at lodging facilities, site offices and material storage sites and to establish a communication system by securing communication means and checking emergency actions and measures.

#### (4) Tax Exemption

As for the procedures for tax exemption (including that of value-added tax) in Tanzania for the equipment and materials procured for the Project, after contractors request ZECO to initiate tax exemption measures, ZECO will send a request to issue a tax exemption letter via MWCEL, which has control over ZECO, to the Ministry of Finance, who will then issue a tax exemption letter through the Zanzibar Revenue Board (ZRB). (At the same time copies of the tax exemption letter will be sent to ZECO and contractors.) Tax will be exempted after contractors submit the prescribed shipping documents with the copy of the tax exempt letter to customs when the shipped equipment and materials arrive at Zanzibar Port or Airport. Caution should be exercised not to impede the progress of the Project with delays owing to tax exemption procedures.

#### 2-2-4-3 Scope of Works

As for the rehabilitation of existing substations, new construction of substations and installation of 33 kV distribution lines that are part of the responsibilities of Japan and Tanzania, the Japanese side will carry out procurement of equipment and materials, installation works, tests, adjustment and necessary civil engineering works. The Tanzanian side will carry out land preparation, connections between rehabilitated substations and existing distribution lines, etc.

The detailed undertakings of the Japanese and Tanzanian sides are as shown in Table 2-2-4-3.1.

Table 2-2-4-3.1 Undertakings to Be Covered by Japan and Tanzania (Proposal)

| No. | Undertakings  | To be covered by |          | Notes   |
|-----|---|------------------|----------|---|
|     |   | Japan            | Tanzania |   |
| 1   | Securing of land for new substations, distribution lines and material storage |                  | ○        | Including securing of a temporary storage site for winches and drums for the installation of distribution lines, and also traffic control |
| 2   | Land leveling and preparation, weeding and removal of obstacles on the sites  |                  | ○        |   |
| 3   | Installation of fences and gates in and around the sites of new substations   |                  |          |   |
|     | (1) Temporary fences and gates to be used during construction                 | ○                |          |   |
|     | (2) Fences and gates to be used after construction                            |                  | ○        |   |
| 4   | Reservation of parking space during construction period                       |                  | ○        |   |

| No. | Undertakings   | To be covered by |                           | Notes   |
|-----|--|------------------|---------------------------|---|
|     |  | Japan            | Tanzania                  |   |
| 5   | Road works   |                  |                           |   |
|     | (1) Roads within the sites of new substations<br>(2) Access roads outside the sites  | ○                | ○                         | Including construction of access roads for transportation of equipment and materials for Mwananya Substation and 33 kV distribution lines, and removal of obstacles |
| 6   | Electric works, water supply and sewage works, site offices and warehouse  |                  |                           |   |
|     | (1) Electric works   |                  |                           |   |
|     | a) Extension of electric lines   |                  | ○                         | Extension of existing low-voltage lines and installation of integration meters (to the primary side)  |
|     | b) Indoor wiring (indoor lighting, sockets, etc.)  | ○                |                           | (Secondary side)  |
|     | c) Installation of incoming panels   | ○                |                           | As needed   |
|     | (2) Water supply works   |                  |                           |   |
|     | a) Water supply works (public water supply and sewage)   |                  | ○                         |   |
|     | b) Installation of indoor pipes and receiving tanks  | ○                |                           |   |
|     | (3) Drainage works   |                  |                           |   |
|     | a) Drainage works (sanitary sewage and rainwater)  |                  | ○                         | As needed   |
|     | b) Construction of indoor pipes and pits   | ○                |                           | As needed   |
| 7   | Furniture for site offices (desks and chairs)  | ○                |                           |   |
| 8   | Production and procurement of equipment and materials  | ○                |                           |   |
| 9   | Transportation of equipment and materials  | ○                |                           |   |
| 10  | Transportation, customs procedures and tax procedures  |                  |                           |   |
|     | (1) Responsibility for marine and air transportation of equipment and materials to Tanzania  | ○                |                           |   |
|     | (2) Procedures for tax exemption and customs clearance at the port of disembarkation   |                  | ○                         |   |
|     | (3) Internal transportation from the port of disembarkation to the sites   | ○                |                           |   |
|     | (4) Exemption or payment of value-added tax on locally procured items  |                  | ○                         |   |
| 11  | Appropriate storage and safety management of equipment and materials in temporary material storage sites and site offices during the construction period | ○                |                           |   |
| 12  | Procedures necessary to obtain the following permits:<br>- Permits required for installation works<br>- Permits to access restricted areas               |                  | ○                         | The permits to be obtained before project implementation  |
| 13  | Relocation of existing telephone lines in Welezo Substation  |                  | ○                         |   |
| 14  | Installation of equipment  | ○                | ○<br>(Equipment provided) |   |
| 15  | Temporary power cut during construction  |                  | ○                         |   |
| 16  | Final connection of the below listed new/existing distribution lines   |                  |                           |   |
|     | - New 11 kV feeders of new substations to existing 11 kV distribution lines<br>- New 33 kV terminal poles to existing 33 kV distribution lines           |                  | ○                         |   |
| 17  | Procurement of terminal materials for the above described final connection works   | ○                |                           |   |



| No. | Undertakings  | To be covered by |                | Notes   |
|-----|---|------------------|----------------|---|
|     |   | Japan            | Tanzania       |   |
| 18  | Replacement of existing 11 kV intermediate poles with 11 kV section poles for feeder connection near Mwanyanya Substation |                  | ○              | To be completed by the recipient country before the start of the installation works at Mwanyanya Substation |
| 19  | Relocation of distribution transformers (including cut-out SW, etc.) to the new 33 kV distribution line on Fumba route    |                  | ○              |   |
| 20  | Training and instruction on completion test, and operation and maintenance of equipment and products                      | ○                |                | Trainees to be selected by the Tanzanian side   |
| 21  | Measuring devices and spare parts   | ○                | ○<br>(Storage) | Measuring devices for installation works  |
| 22  | Operation and maintenance of facilities and procured equipment  |                  | ○              |   |
| 23  | Tree cutting, etc., after project implementation  |                  | ○              |   |
| 24  | Other expenses that are not covered by grant aid  |                  | ○              |   |
| 25  | Payment of the following fees based on the Banking Arrangement:   |                  |                |   |
|     | (1) Fee for opening account at an authorized foreign exchange bank in Japan   |                  | ○              | About 10,000 yen  |
|     | (2) Payment fee   |                  | ○              | 0.1% of the grant aid amount  |

(Note): ○ shows which side will undertake the action.

#### 2-2-4-4 Consultant Supervision

In accordance with Japan's grant aid scheme and the purpose of the basic design, consultants will formulate a consistent project team for detailed design and construction supervision to ensure smooth implementation of the services. As the target sites are scattered and the construction will be a complex one including construction of substations and distribution lines and connection with many pieces of existing transformation equipment, construction will have to be supervised in Tanzania in coordination with ZECO. Therefore, in the phase of construction supervision, consultants shall station at least one engineer in Tanzania to supervise the process, quality, progress and safety in a comprehensive manner. They shall also dispatch other personnel with technical expertise at different stages of the construction, such as installation, commissioning and adjustment, and delivery tests, to supervise these processes that will be conducted by contractors. Moreover, Japanese experts will participate as needed in witnessed inspections at a plant and inspections prior to shipment of equipment produced in Japan to prevent problems after arrival at the sites.

##### (1) Basic Policy on Construction Supervision

As a basic policy, consultants will supervise the construction works so that they will be completed as scheduled, and ensure the quality, progress and delivery of equipment and materials as described in the contract. They will also provide supervision and instruction to contractors so that the construction works at the sites will be carried out safely.

Below are the points to be considered for construction supervision.

##### 1) Process Control

Compare the implementation schedule planned at the time of the contract and the actual progress on a monthly or weekly basis. If a delay is expected, alert the contractor, request

presentation and implementation of measures and give instructions so that the construction works and delivery of equipment and materials will be completed within the construction period specified in the contract. The major check items for the comparison of the planned schedule and the actual progress are as listed below:

- (a) Progress of construction (progress of equipment production at a plant, and progress of civil engineering and construction works at the sites)
- (b) Delivery status (equipment and materials for power transformation and distribution and those for civil engineering and construction works)
- (c) Status of temporary construction and preparation of construction machinery
- (d) Production rate and actual performance of engineers, skilled workers, general workers, etc.

## **2) Quality and Progress Control**

Take the following actions to see whether the produced/delivered/installed equipment and constructed facilities achieve the quality and progress defined in the contract. If the quality or progress is not likely to be achieved, consultants will immediately request the contractor to make corrections, changes and/or adjustments.

- (a) Examination of production drawings and specifications
- (b) Observation of plant inspection or examination of plant inspection results
- (c) Examination of methods of packaging, transportation and temporary storage at the sites
- (d) Examination of working drawings and installation instructions
- (e) Examination of commissioning, adjustment, test and inspection instructions
- (f) Supervision of equipment installation at the site, and observation of commissioning, adjustment, test and inspection
- (g) Examination of installation/production drawings and progress at the sites

## **3) Safety Control**

Through discussion and cooperation with the representatives of the contractors, conduct safety controls to prevent industrial accidents and injury to third persons at the sites during the construction period. Below are the points to remember when conducting safety control at the sites:

- (a) Establishment of safety control rules and appointment of managers
- (b) Prevention of accidents with regular inspection of construction machinery
- (c) Determination of routes for construction vehicles and transporting machinery and enforcement of safe transportation
- (d) Implementation of welfare measures for workers and encouragement of use of vacation

days

## (2) Relations Concerning Project Implementation

Figure 2-2-4-4.1 shows the overall relations of the executing bodies of the Project including construction supervision.

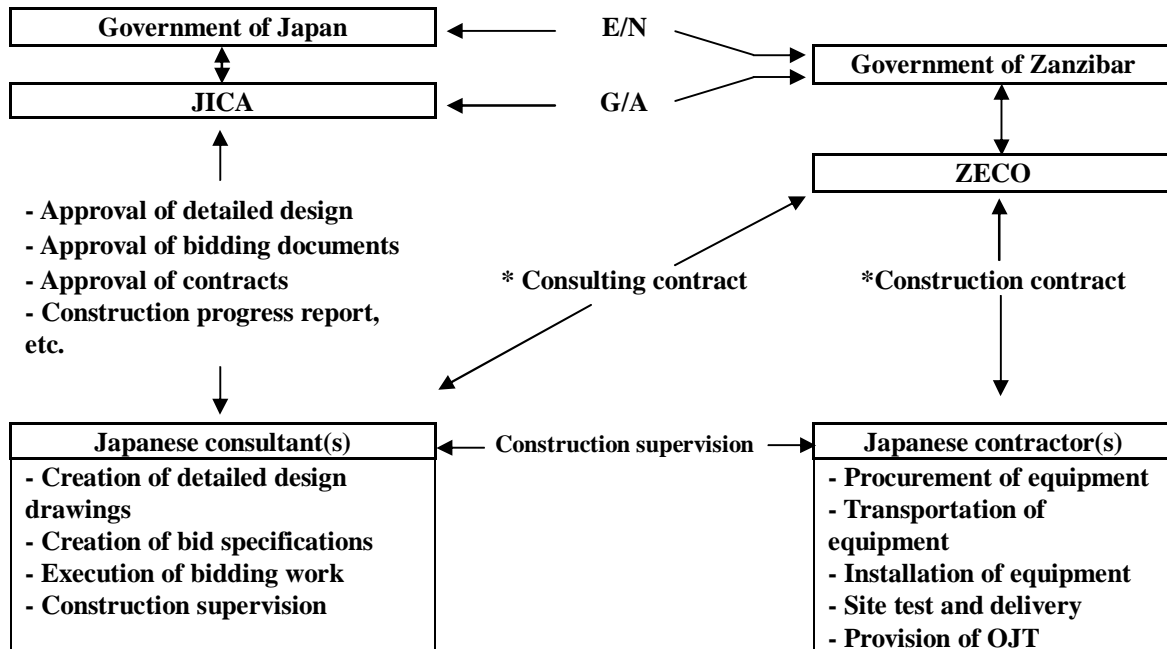


Figure 2-2-4-4.1 Relations of Project Executing Bodies

## (3) Construction Supervisors

Contractors will carry out civil engineering and building works for the rehabilitation/new construction of substations and the installation of 33 kV distribution lines as well as procurement and delivery of equipment and materials for such works. As contractors will use local subcontractors in Tanzania, they will need to help such subcontractors understand the details of the construction period, quality, progress and safety measures defined in the contract. Contractors shall dispatch engineers with experience in similar overseas assignments to provide instruction and advice to local vendors.

Considering the scale and details of the construction works of substation facilities and distribution lines of the Project, it is preferred that contractors will dispatch and station engineers as listed in Table 2-2-4-4.1.

**Table 2-2-4-4.1 Engineers to Be Dispatched by Contractor**

| Title of engineers                               | No. of engineers | Responsibilities  | Dispatch period   |
|--|------------------|---|---|
| Local Procurement Supervisor                     | 1                | Supervision of all construction works; discussion, coordination and obtainment of approval with/from organizations concerned; provision of OJT; management of equipment and material procurement; execution of customs procedures; labor management; accounting | Throughout the building work period (except rainy seasons when construction is interrupted) |
| Test Supervisor-1                                | 1                | Examination and verification of production drawings and observation of inspection, etc., of power distribution equipment  | Periods of drawing approval and equipment inspection  |
| Test Supervisor-2                                | 1                | Examination and verification of production drawings and observation of inspection of power transformation equipment   | Periods of drawing approval and equipment inspection  |
| Test Supervisor-3                                | 1                | Examination and verification of construction drawings   | Periods of drawing approval   |
| Procurement Assistant (Architecture)             | 1                | Assistance to Director: Architecture (Mtoni Substation)<br>Coordination with local subcontractors etc.  | Architecture construction period  |
| Procurement Assistant (local hire)               | 1                | Assistance to Local Procurement Supervisor  | Architecture construction period  |
| Procurement Assistant (Architecture: local hire) | 2                | Assistance to Director: Architecture (Mwanyanya, Welezo Substation)   | Architecture construction period  |
| Office Junior (local hire)                       | 1                | Odd jobs  | Throughout the whole construction period  |

### **2-2-4-5 Quality Control Plan**

Concerning the quality of equipment and materials procured for the Project and construction/installation progress of such items, construction supervisors of the consulting firm(s) will take the following actions of supervision and inspection to see whether the subcontractor(s) have achieved the quality and progress defined in the contract documents (such as technical specifications and detailed design drawing). If the quality or progress is not likely to be achieved, consultants will immediately request the contractor(s) to make corrections, changes and/or adjustments.

- (a) Examination of production drawings and specifications
- (b) Observation of plant inspection or examination of plant inspection results
- (c) Examination of methods of packaging, transportation and temporary storage at the sites
- (d) Examination of contract drawings and installation instructions
- (e) Examination of commissioning, adjustment, test and inspection instructions
- (f) Supervision of equipment installation at the sites and observation of commissioning, adjustment, test and inspection
- (g) Examination of equipment installation drawings and production drawings and progress at the sites

#### **2-2-4-6 Procurement Plan**

Transformation equipment and part of the distribution equipment of the scale planned for the Project are not produced in Tanzania. Therefore, the country imports various types of equipment from European countries and Japan for reasons related to project funds. Although some European manufacturers of transformation equipment have local agents and factories (of transformers, etc.), only a small number of manufacturers have established an after-sales service system for high voltage transformation equipment to provide such services as response to accidents, repair and supply of spare parts. Under such circumstances in the country, transformation equipment vendors for the Project should be selected in consideration of the operability and maintainability of the equipment for Tanzanian engineers and availability of after-sales services such as provision of back-up supplies and response to accidents.

For the above-stated reasons, equipment and materials for the Project shall be procured from the following countries:

##### **(1) Equipment and materials to be locally purchased**

Equipment and materials for construction: wooden poles (for 33 kV distribution lines), cement, sand, aggregate for concrete, concrete blocks, bricks, steel rods, wood materials, petrol, diesel oil, construction vehicles, cranes, trailers and other items for temporary construction

##### **(2) Equipment and materials to be procured from Japan**

###### **1) Equipment and materials for transformation equipment**

33/11 kV transformers, 33/11 kV transformation equipment and other related items

###### **2) Equipment and materials for distribution lines**

Equipment and materials for 33 kV distribution lines (steel poles, conductors, insulators, cross arms and earthing materials)

##### **(3) Equipment and materials to be procured from third countries (DAC countries and ASEAN)**

ABC cables (including accessories), 33/11 kV transformation equipment and other related items

#### **2-2-4-7 Operational Guidance Plan**

Regarding the equipment procured under the Project, training on initial operation and on operation and maintenance methods will be provided before the construction is completed. In principle, instructors from manufacturers will provide training through OJT according to operation and maintenance manuals.

For smooth implementation of the training, ZECO will have to have close communication and discussion with consultants and contractors and appoint full-time engineers who will participate in the

OJT. The appointed engineers should cooperate for the improvement of ZECO’s operation and maintenance capabilities by spreading learned techniques to other personnel.

Moreover, as engineers with expertise will be required for the operation of transformation equipment and the adjustment and tests during and after installation of equipment for 33 kV distribution lines, it seems difficult to use local manpower other than general workers. Therefore, engineers should be dispatched from Japan for quality control, technical guidance and process control.

**2-2-4-8 Implementation Schedule**

Based on Japan’s grant aid scheme, the implementation schedule of the Project has been set as shown in Figure 2-2-4-8.1.

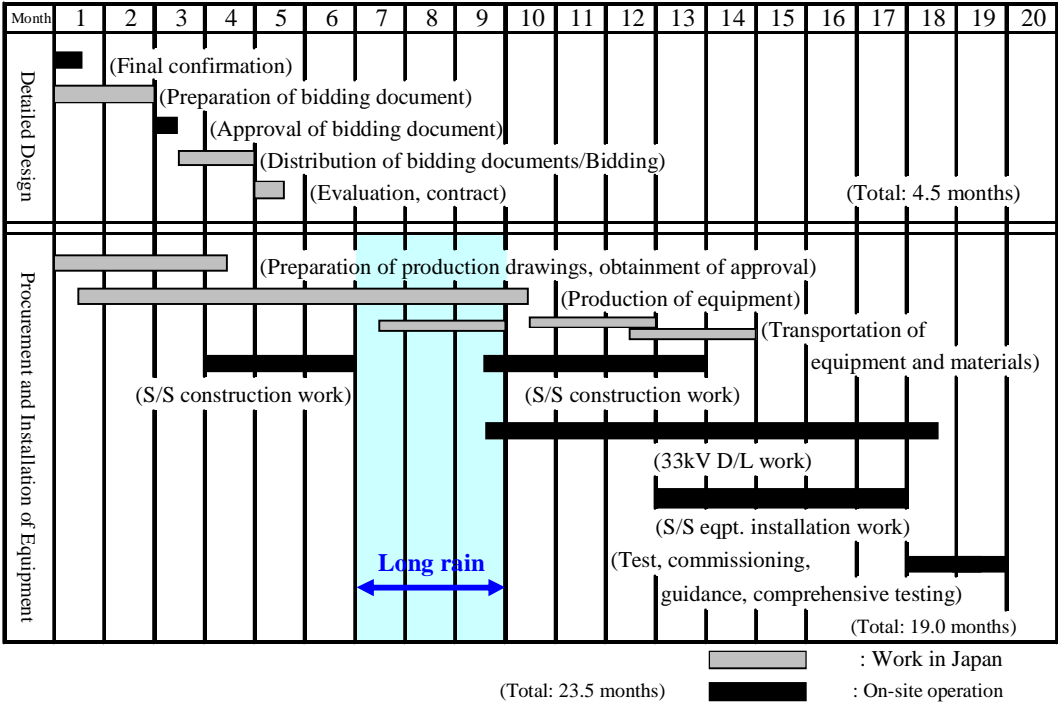


Figure 2-2-4-8.1 Project Implementation Schedule

**2-3 Obligations of Recipient Country**

In addition to the undertakings relating to the construction works described in Section 2-4-3, below are other actions and costs to be taken/covered by the Tanzanian side.

General Matters

- (1) Provision of information and data necessary for the Project
- (2) Swift uploading of equipment and materials procured for the Project at the port in Tanzania, and customs clearance and tax exemption procedures (including VAT exemption for locally procured items)
- (3) Waiver (or payment) of work permit fee (or enterprise tax and the like) for individuals (or

companies) of Japanese nationals dispatched for procurement and installation of equipment and materials for the Project and related procedures

- (4) Permission for persons engaged in construction to work in and around military facilities and other restricted areas
- (5) Fee for opening an account at an authorized foreign exchange bank in Japan and payment fee
- (6) All other expenses that are not covered by Japanese grant aid and are required for the execution of the Project
- (7) Appointment of professional engineers to transfer operation and maintenance techniques for the Project, confirmation of construction works during the construction period and observation of quality inspection of equipment and materials
- (8) Proper use and maintenance of the facilities and equipment constructed/procured with Japanese grant aid (including weeding and tree cutting along the distribution routes)
- (9) Environmental monitoring

#### Construction Works to be Conducted by the Tanzanian Side

- (10) Securing of land for substations, distribution lines, temporary material storage sites and site offices
- (11) Land preparation, tree cutting and removal of obstacles on the sites of substations and distribution lines
- (12) Fences and gates in and around substations (for permanent use)
- (13) Free provision of parking space for construction vehicles
- (14) Construction of access roads for equipment and material transportation to Mwanyanya Substation and to the sites of distribution lines
- (15) Works for power supply, water supply and drainage to substations, temporary material storage sites and office sites
- (16) Relocation of telephone lines, etc.
- (17) Installation of power distribution equipment (portion to be procured by the Japanese side only)
- (18) Power cut during installation works
- (19) Connection of new substations and distribution lines with existing substations and distribution lines
- (20) Replacement of electric poles at the connection points of 11 kV distribution lines from Mwanyanya Substation
- (21) Relocation of existing transformers for power distribution for the replacement of the Fumba line

**2-4 Project Operation and Maintenance Plan**

**2-4-1 Basic Policy**

The proper operation and maintenance (O&M) of distribution and transformation facilities and maintenance of the surrounding environment is essential for a more reliable and stable power supply to customers in the target areas of the Project. Therefore, it is hoped that proper maintenance, including preventive maintenance, will be conducted to reduce the accident rate at the facilities and improve reliability, safety and efficiency.

Figure 2-4-1.1 shows the basic policy on maintenance of distribution and transformation facilities. Thus, the maintenance of equipment procured and installed and facilities constructed under the Project should be mostly conducted for preventive purposes.

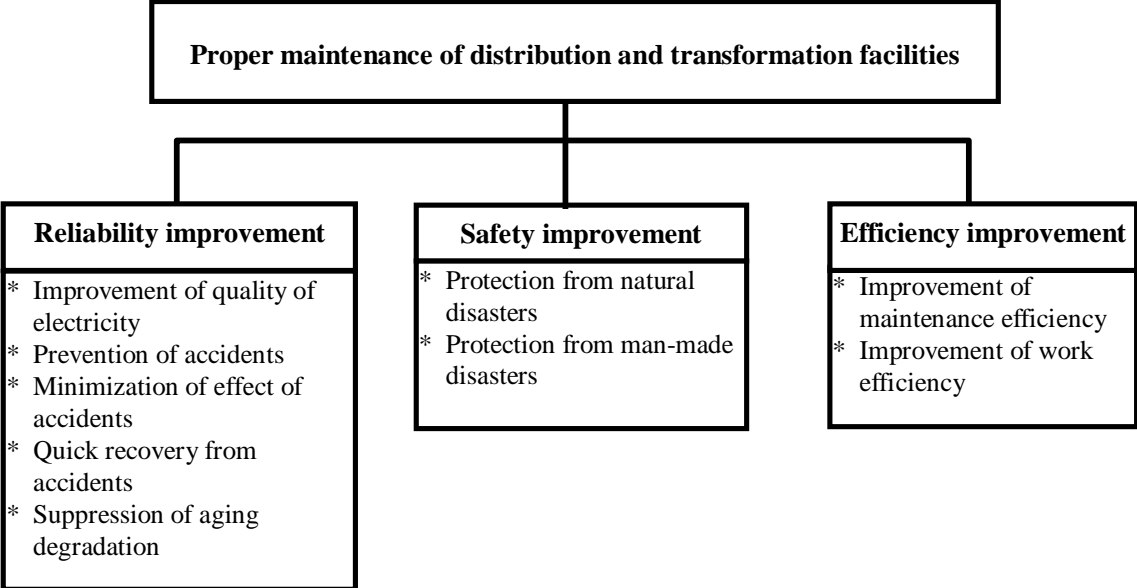


Figure 2-4-1.1 Basic Concept of Maintenance of Distribution and Transformation Facilities

Under the Project, engineers dispatched from Japanese contractors will provide OJT on the operation and maintenance of the distribution and transformation facilities during installation works, tests and adjustment. A great effect can be produced with the provision from Japan of the necessary backup supplies, test devices, maintenance tools, and operation and management manuals as well as proposals about the operation and maintenance system after the service starts.

**2-4-2 Operation and Maintenance Structure**

ZECO, who will be in charge of operation and maintenance after the implementation of the Project, plans to establish a structure with the below listed offices under its overall management. Therefore, an appropriate organizational and personnel system for electricity can be expected.

- Mtoni Substation
- Mwanyanya Substation



- Welezo Substation
- 33 kV distribution lines (North, South and Fumba routes): ZECO Headquarters

### 2-4-3 Regular Inspection Items

#### (1) Regular Inspection of Substation Facilities

Standard regular inspection items for the transformation equipment procured and installed under the Project are as shown in Table 2-4-3.1. The types of inspection of the equipment are categorized into (1) “patrol inspection” to check abnormal heat, noise, etc., that can affect the five senses of human beings on a daily basis, (2) “regular inspection” to check fastening of bolts, surface fouling of insulation and other charged parts that cannot be checked with a daily patrol inspection, and (3) “detailed inspection” to check the functions of interlocking mechanisms between devices and to maintain the accuracy of measuring instruments.

Normally, a regular inspection is conducted once every year or two years and a detailed inspection once every four years. As for the performance degradation of fuses, measuring devices, relays and other devices built into distribution panels, etc., insulation degradation, contact wear and parts whose property may change, such parts should be replaced as needed at the time of regular and detailed inspections after their property and use frequency is checked.

Table 2-4-3.1 Regular Inspection Items for Standard Equipment

| Inspection Items                     | Details of inspection (method)                            | Patrol Inspection | Regular Inspection | Detailed Inspection |
|--------------------------------------|---|-------------------|--------------------|---------------------|
| Visual appearance                    | State of switch indicators and switch indication lights   | ○                 | ○                  |                     |
|                                      | Abnormal noise or odor                                    | ○                 | ○                  |                     |
|                                      | Overheat and discoloration of terminal area               | ○                 | ○                  |                     |
|                                      | Crack, damage and fouling on bushing and porcelain tubes  | ○                 | ○                  |                     |
|                                      | Rust on mounting cases and racks                          | ○                 | ○                  |                     |
|                                      | Abnormal heat (heat gauge)                                | ○                 | ○                  |                     |
|                                      | Clamping of bushing terminals (mechanical check)          | ○                 | ○                  |                     |
| Operating devices and control panels | Indication of measuring gauges                            | ○                 | ○                  | ○                   |
|                                      | Indication of indicator of number of times of operation   |                   | ○                  | ○                   |
|                                      | Moisture, rust and fouling in switch boxes and panels     |                   | ○                  | ○                   |
|                                      | Oiling and cleaning                                       |                   | ○                  | ○                   |
|                                      | Fastening of distributing terminals                       | ○                 | ○                  | ○                   |
|                                      | Opening/closing indication                                |                   | ○                  | ○                   |
|                                      | Air and oil leak  |                   | ○                  | ○                   |
|                                      | Pressure before and after operation (air pressure, etc.)  |                   | ○                  | ○                   |
|                                      | Operation of operation meter                              |                   | ○                  | ○                   |
|                                      | Rusting, deformation and damage of springs (maintenance)  | ○                 | ○                  | ○                   |
|                                      | Errors with pins on clamping points                       |                   | ○                  | ○                   |
|                                      | Inspection (maintenance) of auxiliary switches and relays |                   | ○                  | ○                   |
| Inspection of DC control power       | ○   |                   |                    |                     |
| Measurement and test                 | Measurement of insulating resistance                      |                   | ○                  | ○                   |
|                                      | Measurement of contact resistance                         |                   |                    | ○                   |
|                                      | Breakage of heater wires                                  |                   | ○                  | ○                   |
|                                      | Relay operation test                                      |                   | ○                  | ○                   |

## **(2) Regular Inspection of Distribution Lines**

The most important service for customers concerning the maintenance of distribution lines is to detect trouble, damage and breakage through daily patrol inspection and take recovery actions immediately. In case an accident is predicted, e.g., a ground fault may be caused by a distribution line in contact with trees, etc., preventive measures, such as tree cutting, need to be taken. The following are the major items to be checked during daily patrol inspection:

- (a) Breakage of electric cables
- (b) Damage of insulators
- (c) Contact of electric cables with trees, etc.
- (d) Breakage of electric poles
- (e) Tilt of electric poles
- (f) Status of breakers and switches

## **2-4-4 Backup Supply Procurement Plan**

### **(1) Categories of Backup Supplies**

Backup supplies to be covered by the Project are categorized as below:

- (a) Consumable goods: parts to be replaced according to the condition of wear and deterioration
- (b) Replacement parts: parts to be replaced when damaged
- (c) Emergency backup supplies: devices to be replaced in case of emergency whose failure may stop the distribution/transformation system

### **(2) Facilities for which Backup Supplies Will Be Prepared under the Project**

Below are the facilities for which backup supplies will be procured under the Project:

- (a) 33/11 kV transformation facilities
- (b) 33 kV distribution line facilities

### **(3) Selection Criteria for each Category of Backup Supplies**

#### **1) Consumable goods**

Parts that wear or deteriorate through daily operation and need to be regularly replaced. 100% of the estimated volume required for a year.

#### **2) Replacement parts**

Repair parts that do not regularly wear or deteriorate through daily operation but have high risk of breakage. 100% of the estimated volume required for a year.

### **3) Emergency backup supplies**

Devices that, if damaged due to some unexpected and unforeseeable event, may largely affect stable electricity supply and cannot be quickly repaired at the site. Below are the selection criteria for emergency backup supplies for the Project:

- (a) Protection devices such as lightning arresters and breakers, which play the role of protecting the system from abnormal current and voltage caused by lightning impulses, ground faults and switching impulses, have to be replaced immediately when they fail. In the target area of the Project, where thunderstorms often occur, if the operation of an electric system is continued with a failed protection device in a season with frequent thunderstorms, more lightning may cause a failure of a transformer on the primary side of the system (key substation), which may then cause a fire and lead to large-scale interruption of the electricity supply. As quick recovery of a failed device at the site is difficult with the existing techniques in Tanzania, the Tanzanian side needs to replace a failed device with a new one for the prompt resumption of the power supply. However, the department that will be in charge of operation and maintenance under the Project does not possess such spare devices. Therefore, protection devices and other items have to be procured as emergency replacement supplies.
- (b) As for vacuum circuit breakers, there are two procurement options; (a) to procure breakers as emergency supplies and (b) to procure coils and packing as replacement parts. Considering the technical capabilities of Tanzanian engineers, breakers need to be procured in the method of (a), as (b) would require replacement and test techniques.

### **(4) Budget Preparation for Backup Supplies**

In the Project the minimum required volume of one-year supply of consumable goods and replacement parts will be procured by the Japanese side, and the items to be procured are as listed in Table 2-4-4.1. The Tanzanian side needs to prepare a budget for the purchase of additional consumable goods and replacement parts within a year after the completion of the Project.

### **(5) Test Devices and Maintenance Tools**

The Project will procure devices and maintenance tools required for proper maintenance. Especially maintenance tools need to be procured in the light of the situation described below.

- (a) New maintenance tools will be required for the operation and maintenance of the power transformation and distribution facilities constructed under the Project.
- (b) For project sites other than the above new facilities, the procurement of the minimum maintenance tools for the equipment procured in the Project has been requested, as devices of Japanese make, whose specifications are different from those of the existing devices, will be procured and installed at these sites, too.

Table 2-4-4.1 Backup Supplies and Maintenance Tools to be Procured in the Project

| Item  | Unit  | Mtoni Substation | Welezo Substation | Mwanyanya Substation | 33 kV distribution line |
|---|-------|------------------|-------------------|----------------------|-------------------------|
| 1. Emergency backup supplies  |       |                  |                   |                      |                         |
| (1) 33 kV lightning arrester (single phase, 10 kA)                                | Piece |                  |                   |                      | 9                       |
| (2) 11 kV lightning arrester (single phase, 5 kA)                                 | Piece |                  |                   |                      | 9                       |
| (3) 33 kV vacuum circuit breaker (630 A)  | Unit  | 1                | 1                 | 1                    |                         |
| (4) 33 kV vacuum circuit breaker (1250 A)   | Unit  | 1                |                   |                      |                         |
| (5) 11 kV vacuum circuit breaker  | Unit  |                  | 1                 | 1                    |                         |
| (6) Primary bushing for a 33/11 kV transformer                                    | Piece | 1                | 1                 | 1                    |                         |
| 2. Consumable goods   |       |                  |                   |                      |                         |
| (1) Silica gel for 33/11 kV transformer (20 kg can)                               | Can   | 1                | 1                 | 1                    |                         |
| (2) Lamp for lighting   | Piece | 1                | 1                 | 1                    |                         |
| (3) Ballast for lighting  | Piece | 1                | 1                 | 1                    |                         |
| 3. Replacement parts  |       |                  |                   |                      |                         |
| 3.1 For 33 kV enclosed switchgear cubicles  |       |                  |                   |                      |                         |
| (1) A lamp (various types) or LED for each board (including a socket)             | %     | 100              | 100               | 100                  |                         |
| (2) Fuse (various types)  | Piece | 1                | 1                 | 1                    |                         |
| (3) MCCB (various types)  | Piece | 1                | 1                 | 1                    |                         |
| (4) Protection relay (various types)  | Piece | 1                | 1                 | 1                    |                         |
| (5) Auxiliary relay (various types)   | Piece | 1                | 1                 | 1                    |                         |
| (6) Space heater (with thermostat)  | Piece | 1                | 1                 | 1                    |                         |
| (7) Meter (various types)   | Piece | 1                | 1                 | 1                    |                         |
| (8) Current transformer for measuring instruments (various types)                 | Piece | 1                | 1                 | 1                    |                         |
| (9) Voltage transformer for measuring instruments (various types)                 | Piece | 1                | 1                 | 1                    |                         |
| (10) Switch (various types)   | Piece | 1                | 1                 | 1                    |                         |
| 3.2 For 11 kV enclosed switchgear cubicles  |       |                  |                   |                      |                         |
| (1) A lamp (various types) if LED type will be supplied 10 % (including a socket) | %     |                  | 100               | 100                  |                         |
| (2) Fuse (various types)  | Piece |                  | 1                 | 1                    |                         |
| (3) MCCB (various types)  | Piece |                  | 1                 | 1                    |                         |
| (4) Protection relay (various types)  | Piece |                  | 1                 | 1                    |                         |
| (5) Auxiliary relay (various types)   | Piece |                  | 1                 | 1                    |                         |
| (6) Space heater (with thermostat)  | Piece |                  | 1                 | 1                    |                         |
| (7) Meter (various types)   | Piece |                  | 1                 | 1                    |                         |
| (8) Current transformer for measuring instruments (various types)                 | Piece |                  | 1                 | 1                    |                         |
| (9) Voltage transformer for measuring instruments (various types)                 | Piece |                  | 1                 | 1                    |                         |
| (10) Switch (various types)   | Piece |                  | 1                 | 1                    |                         |
| 3.3 For control panels (33 kV, 33/11 kV)  |       |                  |                   |                      |                         |
| (1) Auxiliary relay (various types)   | Piece | 1                | 1                 | 1                    |                         |
| (2) Meter (various types)   | Piece | 1                | 1                 | 1                    |                         |
| (3) A lamp (various types) if LED type will be supplied 10 % (including a socket) | %     | 100              | 100               | 100                  |                         |
| (4) Fuse (various types)  | Piece | 1                | 1                 | 1                    |                         |
| (5) Alarm window unit   | Piece | 1                | 1                 | 1                    |                         |
| (6) Operation switch (various types)  | Piece | 1                | 1                 | 1                    |                         |
| 3.4 For metering panel (33 kV, 33/11 kV)  |       |                  |                   |                      |                         |
| (1) A lamp (various types) if LED type will be supplied 10 % (including a socket) | %     | 100              | 100               | 100                  |                         |
| (2) Meter (energy meter)  | Piece | 1                | 1                 | 1                    |                         |

| Item  | Unit  | Mtoni Substation | Welezo Substation | Mwanyanya Substation | 33 kV distribution line |
|---|-------|------------------|-------------------|----------------------|-------------------------|
| 3.5 For 33/11 kV transformer for control and protection panels  |       |                  |                   |                      |                         |
| (1) Protection relay (various types)  | Piece | 1                | 1                 | 1                    |                         |
| (2) Meter (various types)   | Piece | 1                | 1                 | 1                    |                         |
| (3) A lamp (various types) if LED type will be supplied 10 % (including a socket)   | %     | 100              | 100               | 100                  |                         |
| (4) Fuse (various types)  | Piece | 1                | 1                 | 1                    |                         |
| (5) Alarm window unit   | Piece | 1                | 1                 | 1                    |                         |
| (6) Operation switch (various types)  | Piece | 1                | 1                 | 1                    |                         |
| 3.6 Low voltage distribution board  |       |                  |                   |                      |                         |
| (1) MCCB various types)   | Piece | 1                | 1                 | 1                    |                         |
| (2) Meter (various types)   | Piece | 1                | 1                 | 1                    |                         |
| (3) A lamp (various types) if LED type will be supplied 10 % (including a socket)   | %     | 100              | 100               | 100                  |                         |
| (4) Fuse (various types)  | Piece | 1                | 1                 | 1                    |                         |
| 3.7 DC supply system  |       |                  |                   |                      |                         |
| (1) MCCB various types)   | Piece | 1                | 1                 | 1                    |                         |
| (2) Meter (various types)   | Piece | 1                | 1                 | 1                    |                         |
| (3) A lamp (various types) if LED type will be supplied 10 % (including a socket)   | %     | 100              | 100               | 100                  |                         |
| (4) Fuse (various types)  | Piece | 1                | 1                 | 1                    |                         |
| 3.8 33 kV and 11 kV cables  |       |                  |                   |                      |                         |
| (1) Termination materials for outdoor 33 kV cable terminals (various types)   | Set   | 1                | 1                 | 1                    |                         |
| (2) Termination materials for indoor 33 kV cable terminals (various types)  | Set   | 1                | 1                 | 1                    |                         |
| (3) Termination materials for outdoor 11 kV cable terminals   | Set   |                  | 1                 | 1                    |                         |
| (4) Termination materials for indoor 11 kV cable terminals  | Set   | 1                | 1                 | 1                    |                         |
| 3.9 33/11 kV transformer  |       |                  |                   |                      |                         |
| (1) Gasket  | Set   | 1                | 1                 | 1                    |                         |
| (2) Buchholz relay  | Piece | 1                | 1                 | 1                    |                         |
| (3) Oil temperature gauge   | Piece | 1                | 1                 | 1                    |                         |
| (4) Oil level gauge   | Piece | 1                | 1                 | 1                    |                         |
| 4. Test devices   |       |                  |                   |                      |                         |
| (1) Oil purification system for VT (consisting of the below components)<br>- Oil purifier (outdoor, portable, 4,000 L/hr)<br>- Vacuum pump (outdoor, portable, 3,000 L/min)<br>- Oil filter (outdoor, tank type, 200 L/min) | Set   | 1                |                   |                      |                         |
| (2) Oil insulation tester   | Unit  | 1                |                   |                      |                         |
| (3) Single phase protection relay test device   | Set   | 1                |                   |                      |                         |
| (4) Three-phase protection relay tester   | Unit  | 1                |                   |                      |                         |
| (5) Universal tester  | Unit  | 1                |                   |                      |                         |
| (6) Phase rotation indicator  | Unit  | 1                |                   |                      | 1                       |
| (7) Protection relay failure analyzer   | Unit  | 1                |                   |                      |                         |
| (8) Voltage detector (AC3 – 35 kV)  | Unit  | 1                | 1                 | 1                    | 1                       |
| (9) Voltage detector (AC600V)   | Unit  | 1                | 1                 | 1                    |                         |
| (10) Insulation resistance tester (megger) 500 V  | Unit  | 1                | 1                 | 1                    | 1                       |
| (11) Insulation resistance tester (megger) 1000 V   | Unit  | 1                | 1                 | 1                    | 1                       |
| (12) DC pressure proof tester (0 – 100 kV, including DC electroscope)   | Unit  | 1                |                   |                      |                         |

| Item   | Unit | Mtoni Substation | Welezo Substation | Mwanyanya Substation | 33 kV distribution line |
|--|------|------------------|-------------------|----------------------|-------------------------|
| (13) Simple earth resistance tester              | Unit | 1                | 1                 | 1                    | 1                       |
| (14) Digital multimeter                          | Unit | 1                | 1                 | 1                    | 1                       |
| (15) Clamp-on type tester                        | Unit | 1                | 1                 | 1                    |                         |
| (16) Clamp-type tester (for energy meter)        | Unit | 1                | 1                 | 1                    | 1                       |
| 5. Maintenance tool                              |      |                  |                   |                      |                         |
| (1) Compressor (with dice)                       | Unit |                  |                   |                      | 3                       |
| (2) Compression tool (10 – 120 mm <sup>2</sup> ) | Unit |                  |                   |                      | 3                       |
| (3) Compression tool (10 – 250 mm <sup>2</sup> ) | Unit | 1                | 1                 | 1                    |                         |
| (4) Cable cutter                                 | Unit | 1                | 1                 | 1                    | 3                       |
| (5) Tools for electrical work                    | Set  | 1                | 1                 | 1                    | 3                       |
| (6) Operating stick for line section switch      | Unit |                  |                   |                      | 3                       |
| (7) Circuit Breaker lifter                       | Unit | 1                | 1                 | 1                    |                         |
| Tools for ABC cable lines                        |      |                  |                   |                      |                         |
| (8) Puller for stringing (vehicle mounted)       | Unit |                  |                   |                      | 1                       |
| (9) Rope for line stringing (dia. 20 mm x 500 m) | Set  |                  |                   |                      | 1                       |
| (10) Cable Drum stand                            | Set  |                  |                   |                      | 4                       |
| (11) Guiding roller                              | Set  |                  |                   |                      | 24                      |
| (12) Come-along (tension 17 kN)                  | Unit |                  |                   |                      | 8                       |
| (13) Wire puller (tension 16 kN)                 | Unit |                  |                   |                      | 4                       |
| (14) Pulling grip (for 22 kV)                    | Set  |                  |                   |                      | 4                       |
| (15) Swivel                                      | Set  |                  |                   |                      | 4                       |
| (16) Tension meter (20 kN)                       | Set  |                  |                   |                      | 4                       |
| (17) Ratchet wrench set                          | Set  |                  |                   |                      | 4                       |
| (18) Winch                                       | Set  |                  |                   |                      | 4                       |
| (19) Torch for cable termination                 | Set  |                  |                   |                      | 4                       |

## 2-5 Project Cost Estimation

### 2-5-1 Initial Cost Estimation

#### (1) Cost to be Covered by the Recipient Country 2,771,338,000 TZS (approx. 168.50 million yen)

Below are the details of the responsibilities and cost amounts to be borne by the Tanzanian side.

- (a) Securing of land for new substations, distribution lines and material storage: 18,500,000 TZS (Approx. 1.12 million yen)
- Compensation for the site of Mwananyanya Substation = 3,500,000 TZS
  - Compensation for the site of Welezo Substation = 15,000,000 TZS
- (b) Land leveling and preparation, weeding and removal of obstacles in the sites: 242,700,000 TZS (Approx. 14.76 million yen)
- Land preparation of substation sites (100,000 TZS x 3 sites) = 300,000 TZS
  - Weeding in buffer zones (3,000 TZS × 80,800 m) = 242,400,000 TZS
- (c) Installation of fences and gates in and around the sites of new substations to be used after completion of Project: 32,000,000 TZS (Approx. 1.95 million yen)
- Mwananyanya Substation = 14,000,000 TZS
  - Welezo Substation = 18,000,000 TZS

|  |                   |                              |
|--|-------------------|------------------------------|
| (d) Works for access roads outside the sites:  | 6,000,000 TZS     | (Approx. 0.36 million yen)   |
| (e) Water supply works (public water supply and sewage):<br>• 2,000,000 TZS × 3 sites = 6,000,000 TZS  | 6,000,000 TZS     | (Approx. 0.36 million yen)   |
| (f) Drainage works (sanitary sewage and rainwater):<br>• 7,000,000 TZS × 3 sites = 21,000,000 TZS  | 21,000,000 TZS    | (Approx. 1.28 million yen)   |
| (g) Registration fee for Japanese supervisors and engineers for the construction period:<br>• Registration fee for consultants = 26,400,000 TZS<br>• Registration fee for contractors = 27,150,000 TZS | 53,550,000 TZS    | (Approx. 3.26 million yen)   |
| (h) Relocation of existing telephone lines in Welezo Substation:   | 3,000,000 TZS     | (Approx. 0.18 million yen)   |
| (i) Installation of equipment (equipment provided):  | 12,080,000 TZS    | (Approx. 0.74 million yen)   |
| (j) Replacement of existing 11 kV intermediate poles with 11 kV section poles for feeder connection near Mwanyanya Substation:   | 4,000,000 TZS     | (Approx. 0.24 million yen)   |
| (k) RAP Compensation   | 2,372,508,000 TZS | (Approx. 144.25 million yen) |
| (l) Commissions concerning A/P (Authorization to Pay):<br>• Advising commission of A/P = 156,000 TZS<br>• Payment commissions = 46, 875,000 TZS  | 47,031,000 TZS    | (Approx. 2.86 million yen)   |

## (2) Condition for Cost Estimation

- (a) Estimated in: October 2010
- (b) Rate of exchange:  
 US\$1 = 89.91 yen (Average TTS from April to September 2010)  
 TZS1 = 0.0608 yen (Average TTS from April to September 2010)  
 Euro 1 = 115.31 yen (Average TTS from April to September 2010)
- (c) Construction/procurement period: Periods for D/D and equipment procurement/installation are shown in the project implementation schedule.
- (d) Others: the Project shall be implemented in accordance with the grant aid scheme of the Government of Japan.

### 2-5-2 Operation and Maintenance Cost

ZECO, which conducts operation and maintenance of the existing substations and transmission and distribution lines, will also be responsible for the operation and maintenance of the substations to be rehabilitated/constructed and distribution lines to be installed under the Project after such facilities are

provided.

Eight operators will be assigned to the newly constructed substations. These posts will be filled with existing ZECO staff who will be transferred from other posts; therefore new employees will not have to be hired. The distribution lines that will be renewed/installed will be covered by the staff who are currently in charge.

For the sound operation of the substations that will be rehabilitated/constructed under the Project, backup supplies shown in Table 2-4-4.1 (consumable goods and replacement parts) will always have to be stored, and the necessary budget (about 150 million Tsh/year) needs to be prepared. Considering that the repair and maintenance cost of the branch was about 1,570 million/Tsh in 2010, it is deemed that the maintenance cost for the substations can be covered with the budget of ZECO.

## **2-6 Other Relevant Issues**

The following are the important points that may have a direct impact on the smooth implementation of the cooperation project:

- (1) If there is a delay in deciding upon compensation for or obtaining agreement from the residents who will be affected by the construction of the 33 kV distribution lines, the construction schedule of the distribution lines will be affected. Therefore, the Tanzanian side should pay attention to the progress status of the related procedures.
- (2) As for the Fumba route, which will be constructed under the Project, there is also a plan for another donor to install transformation facilities. Therefore, the Tanzanian side should carefully coordinate the facility allocation plan and installation schedule so that neither of the projects will be impeded.
- (3) If there is a delay in the 132 kV construction work that will be carried out by MCA-T, it will affect the development of the effects of the Project. Therefore, the Tanzanian side should carefully coordinate the facility allocation plan and installation schedule so that neither of the projects will be impeded.
- (4) Tanzania has to carry out without delay the budgeting procedures for the construction to be covered by the Tanzanian side and make sure all the necessary works will be completed before the implementation of the Project. As for the land acquisition, although discussion with land users is scheduled to end in February 2011, land preparation has to be completed before the construction starts and the Tanzanian side should carefully coordinate the land acquisition schedule so that the Project will not be impeded.



## **CHAPTER 3**

# **PROJECT EVALUATION**

## **Chapter 3 Project Evaluation**

### **3-1 Preconditions**

#### **3-1-1 Preconditions for Execution of the Project**

The preconditions for execution of the Project include the acquisition of land for substations; compensation for occupation of land distribution lines; acquisition of environmental permissions related to execution of the Project, and the following matters for which the counterpart is required to be responsible in the construction work. Tanzania has already started necessary procedures, and thus there is no particular concern about the preconditions.

- (1) Secure land for substations and distribution lines, temporary storage for materials and equipment and site office
- (2) Land preparation for substations and distribution lines, cutting of trees and removal of obstacles
- (3) Free provision of parking lots for construction
- (4) Construction of access roads to Mwanyanya Substation and distribution lines for transportation of materials and equipment
- (5) Installation of power source, water and drain pipes to substations, temporary storage for materials and equipment and site office
- (6) Relocation of telephone lines on the site of substation (Welezo only)
- (7) Replacement of electric poles at connection point of 11 kV distribution lines from Mwanyanya Substation

#### **3-1-2 Preconditions and External Conditions for Achieving Overall Project Plan**

In order to produce and sustain the effects of the Project, Tanzania is required to handle the following tasks.

- (1) Tanzania has to carry out without delay the budgeting procedures for the compensation to be paid to residents who are affected by the construction of 33 kV distribution lines as well as the construction to be covered by the Tanzanian side and make sure all the necessary works will be completed before the implementation of the project. It also needs to secure the land for the substations to be constructed in the project.
- (2) Tanzania needs to secure the budget for personnel training necessary for maintenance and it needs to ensure that they can participate in the training as necessary.
- (3) ZECO needs to ensure smooth management of income including collection of charges to be financially healthy.
- (4) The 132kV construction project to be performed by another donor and the Fumba route

constructed in the Project would affect the development of the effect of the Project if the new construction of transformation facilities by the abovementioned donor is delayed; the Tanzanian side needs to carefully coordinate the facility allocation plan and installation schedule so that neither of the projects will be impeded.

### 3-2 Project Evaluation

#### 3-2-1 Relevance

As described below, the Project contributes to the realization of the development plan formulated by Tanzania and its energy policy, and provides the general public including people in poverty with benefits. Thus, it is highly relevant as a project subject to the cooperation.

##### (1) Beneficiaries

The Project will enable stable supply of power to 620,000 residents of Unguja Island. The installation of 33kV distribution lines will also ease the excessive load of power across the island. The number of beneficiaries (households benefiting from the Project) at each feeder confirmed to ZECO in the field survey is shown in Table 4-2.1.

Table 4-2.1 ZECO's Customers (Households)

| Area of Power Supply              | Component in the Project  | General Household | Public Facility | Commercial Facility/Factory | Subtotal | Total |
|-----------------------------------|---|-------------------|-----------------|-----------------------------|----------|-------|
| Around existing 33kV North feeder | New installation of 33 kV Mtoni – Mahonda line and construction of Mwanyanya Substation | 18566             | 85              | 40                          | 18691    | 53942 |
| Around existing 33kV South feeder | New installation of 33 kV Mtoni – Tunguu line and construction of Welezo Substation     | 18610             | 96              | 34                          | 18740    |       |
| Around existing 33kV Fumba feeder | New installation of 33 kV Mtoni – Fumba line  | 16396             | 79              | 37                          | 16512    |       |

[Source] ZECO

##### (2) Contribution to stable operation of public welfare facilities

As in Table 4-2.1 “ZECO’s Customers (Households)” shown above, the Project contributes to stable power supply to (260) public and welfare facilities. It helps improve the ability of power facilities, and reduces the risk of power problems, such as power outage and drops in voltage when X-ray machines and other medical equipment are in operation at these public and welfare facilities, and electric tools are used at factories, hotels and other facilities. In sum, the Project contributes to economic development via reducing the risk of malfunctions of electric products and expanding the time when they can be used.

##### (3) Operation and maintenance capacity

Because the materials and equipment to be obtained in the Project are used in the same way as power facility equipment widely used in Tanzania, they can be operated and maintained sufficiently with the technology possessed by Tanzania and thus they will not cause any

particular problem in the implementation of the Project. At the same time, the cost of power generation by emergency generators to deal with frequent accidents and other incidents at the Mtoni substation is high, compared to the cost of electric power transmitted from the mainland of Tanzania, and thus places a financial burden on ZECO. The realization of the Project will alleviate the financial burden.

#### **(4) Projects that assists development plan of Tanzania**

As described below, the Project is highly relevant because it contributes to the realization of stable power supply promoted in the MKUZA, the development plan formulated by Tanzania, and the Zanzibar Energy Policy 2009 and benefits the general public including people in poverty. In the project site area, the power distribution facilities are excessively loaded and ageing due to such reasons as delayed facility investment, while the power demand of schools and hospitals and other social and welfare facilities and general residences has increased. This has caused frequent power outages, voltage drops, and restricted power supply and supply failures due to facility trouble, which damages the reliability of power supply. Against this backdrop, local residents and public facilities and other power consumers have no other choice but unstable power supply. Because the Project is expected to have significant impacts as explained below and it improves the power supply in Zanzibar that needs immediate enhancement, the grant aid project needs to be implemented urgently.

#### **(5) Japan's grant aid project scheme**

The Project is designed to be reasonable in terms of its contents and work schedule within the framework of the Japan's grant aid project scheme, in that major equipment will be procured in Japan and that it is scheduled to complete within the E/N. Therefore, it can be implemented within no specific difficulty. Because ZECO is a state-run corporation, the relevance and urgency of the Project are justifiable, and there is no maintenance- and management-related problem, as described earlier, it can be implemented within Japan's grant aid project scheme with no obstacle. It can be implemented with no specific difficulty as the contents and the schedule of the Project are designed within the framework of the grant aid project scheme.

#### **(6) Necessity and advantage of using Japan's technology**

Japan has long had the technology for improving the reliability of electric power equipment in order to stably supply power to customers by reducing the duration of power outage and voltage fluctuations. The technology for the stable power supply that has been used for a long time in Japan at transformation and distribution facilities can be utilized.

### **3-2-2 Effectiveness**

The Project is expected to have the following effects:

**(1) Quantitative effect**

| Indicator  | Baseline (2010)   | Target (2018)                 |
|--|---|-------------------------------|
| <p><b>Power outage</b><br/>As there is no alternative 33 kV distribution line, there is no redundancy to ensure stable power supply with an alternative route in case of an accident or during construction; therefore, a power outage caused by an accident lasts longer.</p> | <p>Approx. 120 hours / year</p>   | <p>12 hours *1)</p>           |
| <p><b>Increase in capacity of power supply facility</b></p>  | <p>40MW</p>   | <p>78MW</p>                   |
| <p><b>Voltage drop on consumer side</b><br/>Because of tight distribution capacity via 33kV line, it is difficult to increase consumers and the power supply to public facilities and for industrial use has been troubled.</p>  | <p>Due to the shortage of 33 kV distribution lines, the voltage drop of each line is 2% to 22%.</p> | <p>Improving 2% to 9% *2)</p> |
| <p><b>Reduction of power loss</b><br/>Because of voltage drops due to the demand substantially exceeding the allowable range in the existing distribution system, there is significant power loss and it lessens the efficiency of the power supply.</p>                       | <p>Power loss of the existing distribution system as a whole is approx. 7 MW.</p>                   | <p>Below 5 MW *2)</p>         |

\*1) It is limited to power outages caused by accidents that include trees making contact with distribution lines due to storms and natural disasters, and the duration is at the minimum level.

\*2) It is based on the power flow calculation result.

## (2) Qualitative effect (project as a whole)

| Current Conditions and Problems  | Measures in the Project (Cooperation Project)   | Effect and Degree of Improvement  |
|--|---|---|
| In Zanzibar, electric outages are frequent due to decrepit substations and distribution facilities, and overload, interfering with the industrial development in the region. | The current substations will be upgraded, or new ones will be constructed. And distribution facilities will be constructed. | Stable supply of electricity will vitalize tourism including hotel businesses, and other local industries.  |
| In Zanzibar, electric outages are frequent due to decrepit substations and distribution facilities, and overload, affecting the stable operation of medical institutions.    | The current substations will be upgraded, or new ones will be constructed. And distribution facilities will be constructed. | Stable supply of electricity to hospitals, universities and other public facilities will enable the stable management of these medical, educational and other institutions, contributing to an improvement of services to local citizens. |
| In Zanzibar, electric outages are frequent due to decrepit substations and distribution facilities, and overload, deteriorating the living environment of local citizens.    | The current substations will be upgraded, or new ones will be constructed. And distribution facilities will be constructed. | Stable supply of electricity will improve the living environment of local citizens.   |

The individual beneficiary effect of each component of the Project is shown in the following table.

## (3) Qualitative effect (each component)

| Component   | Current Problems  | Expected Effect   |
|---|---|---|
| Northern route [benefited from the new installation of 33kV line from Mtoni to Mahonda, and new construction of Mwanyanya Substation] | Due to the lack of financial resources, investment in substations and distribution facilities delayed on Unguja Island. The distribution capacity became insufficient and major power facilities including 132/33kV Mtoni Substation are overloaded and accidents occur frequently. As a result, power outages occur for many hours.<br><br>Accidents and power outages are frequent at the 33kV North feeder due to overload, and, at maximum, the power failure totaled 2 hours and 24 minutes a day, or the electricity broke down 12 times a day (in 2010). For example, the measured value of voltage on October 10, 2010, at Promiser Lodge in Nungui at the end of the existing 33 kV North feeder was 175 V (76% of rated voltage, 230 V), showing a significant voltage drop of the 33 kV distribution line from ZECO. | For example, a major hospital in Zanzibar, the Military Hospital (3,000 patients per month), does not receive enough power for the demand. Although it has a plan to expand wards that are in short supply, securing enough power for maintenance and management of medical equipment is an issue. The execution of the Project enables the stable operation of public facilities and shops in the target area, which will vitalize city functions and people's day-to-day lives. The new construction of the northern route and new construction of Mwanyanya Substation in the Project will considerably alleviate the voltage drop and other problems. This will enable the Military Hospital to use medical equipment and X-ray machines that require power in a stable manner, provide medical services and reduce fuel costs for private power generation. In sum, public facilities, local citizens and other parties will benefit from the Project. |
| Southern route [benefited from the new installation of 33   | Accidents and power outages are relatively frequent at the 33kV South feeder, and at maximum, the power failure totaled 1 hour and  | For example, with an eye on the execution of the Project, Zanzibar University intends to establish science and engineering departments in the future  |

|  |   |   |
|--|---|---|
| <p>kV line from Mtoni to Tunguu and new construction of Welezo Substation]</p>             | <p>21 minutes a day, or the electricity broke down 6 times a day (in 2010). The measured value of voltage on October 9, 2010 at Michamvi School at the end of the existing 33 kV South feeder was 175 V (76% of rated voltage, 230 V). This also shows a significant voltage drop of the 33 kV distribution line from ZECO as was in the case of 33 kV North feeder above. Zanzibar University (established in 1998, 2,000 students and 101 teaching and administrative staff) which is located on the southern route suffers major voltage drops and frequent power outages. This has caused problems in regards to maintenance and management of educational equipment.</p>   | <p>and the improvement of the power supply will enable the establishment of such departments. In sum, public facilities, local citizens and other parties will benefit from the Project.</p>  |
| <p>Fumba route [benefited from the new installation of 33 kV line from Mtoni to Fumba]</p> | <p>At the 33kV Fumba feeder, no particular accident or power outage occurred due to overload, since its load is not so heavy as those at the North and South feeders. However, the load is expected to soar in near future because of a plan to expand the airport along the 33kV Fumba feeder and another plan to develop factories and hotels near the Fumba area. This is highly likely to cause overloads. For example, the measured value of voltage at Michamvi School at the end of the existing 33 kV South feeder was 190.6 V (82.9% of rated voltage, 230 V) on October 11, 2010. For this situation, industrial areas at the end of distribution lines have limited power supply. For example, because a factory (10 employees) that builds small fishing boats can use electric tools only for four hours a day, the production is unstable, limiting working hours to several hours per day.</p> | <p>Private power generation due to power outage will be reduced and energy spending of public facilities and the general public will be eased. When electric power can be received sufficiently, lighting and electric tools can be used more freely, which enables production increase, safe working environment, stable employment and profit increase.</p> |

**(4) Specific examples of beneficiary effects of the project**

The beneficiary effect of the Project needs to be assessed not just in terms of improvements of the quality and credibility of power supply, but also from the viewpoint of how the improvements will bring the benefits to local citizens in the areas subject to the Project. In line with this viewpoint, an interview survey was conducted in this study: personnel visited public facilities (hospitals and schools), factories, etc. which are assumed to be the major subjects of the beneficiary effects, and interviewed them concerning the current situation of the electricity to grasp the baseline ideas and expected beneficiary effects. The findings of the survey are shown below.

## 1) Zanzibar Military Hospital

[Benefited from the new installation of 33kV line from Mtoni to Mahonda, and new construction of Mwanyanya Substation]

|   |  |
|---|--|
| Interviewer   | Dr. Haroub Yussuf (Dr. Incharge)   |
| Summary of the facilities and the current situation | <ul style="list-style-type: none"> <li>* The electricity is supplied to the hospital via the 33kV distribution line from Mtoni Substation.</li> <li>* No. of persons concerned: No. of staff members: approx. 95 persons <ul style="list-style-type: none"> <li>No. of inpatients: approx. 50 persons</li> <li>No. of outpatients: 3,000 persons or more / month</li> </ul> </li> <li>* Although the hospital is a military facility of Tanzania (Tanzania People's Defense Force), 90% or more of its patients are general patients. Receiving governmental subsidies, the hospital accepts patients who cannot afford medical service fees.</li> <li>* Year of foundation: 1985</li> <li>* Site area: 32 ha</li> <li>* The hospital is equipped with a power generator for its own use (whose specific capacity is unknown), but its capacity is small. It is used to supply the electricity only to crucial facilities within the hospital in the case of power outages.</li> <li>* It is equipped with 2 transformers (whose capacities are 100kVA and 200kVA, respectively).</li> <li>* It is not supplied the electricity enough to meet its current demand. The demand for electricity is expected to increase in future due to the plan to increase the number of wards.</li> <li>* Drops in and fluctuations of voltages, and power outages are frequent; the hospital fails to enjoy stable power supply at the moment.</li> </ul> |
| Beneficiary effect                                  | The new installation of 33kV line from Mtoni to mahonda, and new construction of Mwanyanya Substation under the Project will considerably alleviate problems of drops in voltage, etc., leading to stable provision of medical services and a reduction in fuel costs of the power generator for own use. This is expected to produce beneficiary effects for patients (approx. 3,000 persons / month) of the hospital.  |

## 2) Zanzibar University

[Benefited from the new installation of 33 kV line from Mtoni to Tunguu and new construction of Welezo Substation]

|   |   |
|---|---|
| Interviewer   | Ms. Homick A. Muha (Deputy Vice Chancellor Administrator)<br>Mr. Abdul J. Hamad (Estate Engineer)   |
| Summary of the facilities and the current situation | <ul style="list-style-type: none"> <li>* The electricity is supplied to the university via the 33kV distribution line from Mtoni Substation.</li> <li>* The university is private-run, and students can read law, management (marketing and accounting), IT, and economics.</li> <li>* No. of persons concerned: No. of staff members: 2,000 persons or more (approx. 2,000 students, and 101 staff members)</li> <li>* Year of foundation: 1998</li> <li>* Site area: 58 ha</li> <li>* The university is equipped with 2 power generators for its own use (whose capacities are 225kVA and 70kVA, respectively).</li> <li>* It is equipped with 1 transformer (whose capacity is 350kVA).</li> </ul> |



|                    |  |
|--------------------|--|
|                    | <ul style="list-style-type: none"> <li>* The power supply satisfies the current demand. However, drops in voltage from the distribution line from ZECO are considerable, and power outages are frequent. The demand for the electricity is expected to increase due to the plan to launch newly the department of engineering, etc.</li> </ul>   |
| Beneficiary effect | The new installation of 33kV line from from Mtoni to Tunguu and new construction of Welezo Substation under the Project will considerably alleviate drops in voltage, leading to provision of stable educational environments and a reduction in fuel costs of the power generator for own use. This is expected to produce beneficiary effects for students of the university (2,000 students). |

### 3) Fiber Glass Factory

[Benefited from the new installation of 33 kV line from Mtoni to Fumba]

|   |  |
|---|--|
| Interviewer   | Mr. Mustuk (Electrician)   |
| Summary of the facilities and the current situation | <ul style="list-style-type: none"> <li>* The electricity is supplied to the factory from Mtoni Substation.</li> <li>* The factory manufactures small vessels, using fiber glass.</li> <li>* Year of foundation: 2000 (the headquarters are located in Abu Dhabi, UAE)</li> <li>* The capacity of transformer at the factory is 200kVA.</li> <li>* No. of workers: approx. 10 persons</li> <li>* Since the power supply is limited, the factory is operated for 4 hours per day only. With sufficient power supply, the factory is able to launch a plan to extend the operating hours and increase the number of workforce.</li> <li>* The factory is equipped with 2 power generators, one of which is out of order. The capacity of the usable generator is 60kVA.</li> <li>* Site area: approx. 10 acres</li> </ul> |
| Beneficiary effect                                  | The installation of 33 kV line from Mtoni to Fumba will improve the productivity of the factory, and is expected to produce the beneficiary effect of, for example, stable employment at the factory.  |

## **APPENDICES**

## **APPENDIX 1**

### **MEMBER LIST OF THE STUDY TEAM**

## 1. Member List of the Study Team

| Name                  | Work Assignment  | Position  |
|-----------------------|--|---|
| Mr. Akira Niwa        | Leader   | Senior Advisor, JICA  |
| Mr. Tetsuya Takimoto  | Planning Management  | Deputy Director<br>Electric Power and Energy Division<br>Natural Resource and Energy Group<br>Industrial Development Department, JICA |
| Mr. Kiyofusa Tanaka   | Chief Consultant /<br>Power Development Planning   | Yachiyo Engineering Co., Ltd.   |
| Mr. Kyoji Fujii       | Acting Chief Consultant /<br>Power Development Planning at<br>the 3 <sup>rd</sup> Survey | Yachiyo Engineering Co., Ltd.   |
| Mr. Tomonori Kondo    | Substation Equipment Planning /<br>Facilities Planning                                   | Yachiyo Engineering Co., Ltd.   |
| Mr. Tatsuya Kobayashi | Distribution Installation Planning   | Yachiyo Engineering Co., Ltd.   |
| Mr. Susumu Imai       | Civil Structure / Natural<br>Condition Survey  | Yachiyo Engineering Co., Ltd.   |
| Mr. Mamoru Shibata    | Environmental and Social<br>Considerations   | Yachiyo Engineering Co., Ltd.   |
| Mr. Yoshio Nakagawa   | Construction and Procurement<br>Planning / Cost Estimation                               | Yachiyo Engineering Co., Ltd.   |
| Mr. Daisuke Akatsuka  | Coordinator / Assistant<br>Distribution Installation Planning                            | Yachiyo Engineering Co., Ltd.   |

## **APPENDIX 2**

### **STUDY SCHEDULE**

## 2. Study Schedule

### (1) 1<sup>st</sup> Field Survey

| No. | Date   | A day of the week | Contents of Survey   |  | Stay at  |  |
|-----|--------|-------------------|--|--|--|--|
|     |        |                   | JICA (Niwa, Takimoto) and Consultant (Tanaka, Kondo, Kobayashi, Imai, Shibata, Nakagawa, Akatsuka)   |  |  |  |
| 1   | 19-Sep | Sun               | (JICA: Niwa) Trip [Accra 13:10 Nairobi 05:30+1, KQ511]<br>(JICA: Takimoto) Trip [Narita 20:50 Doha 05:15+1, QR803]   |  | on Flight  |  |
| 2   | Sep-10 | Mon               | (JICA: Niwa) Trip [Nairobi 08:05 Dar es Salaam 09:20, KQ480]<br>(JICA: Takimoto) Trip [Doha 07:20 Dar es Salaam 13:05, QR544]  | (Tanaka, Kobayashi, Shibata, Nakagawa, Akatsuka)<br>Trip [Narita 21:40 Dubai 03:30+1, JL5095 & EK319]  | Dar es Salaam (JICA) on Flight (Consultant)  |  |
| 3   | Sep-10 | Tue               | (JICA)<br>·Courtesy call and explanation of Inception report and Questionnaire to JICA Tanzania Office and EOJ<br>(JICA, Tanaka, Kobayashi, Shibata, Nakagawa, Akatsuka)<br>Trip [Dar es Salaam 17:20 Zanzibar 17:50, PW715]   | (Tanaka, Kobayashi, Shibata, Nakagawa, Akatsuka)<br>Trip [Dubai 10:50 Dar es Salaam 15:20, EK725]  | Unguja   |  |
| 4   | Sep-10 | Wed               | ·Courtesy call and Explanation of Inception Report and Questionnaire to MWCEL and ZECO<br>·Site survey (existing Mtoni S/S, new Mwananyanya S/S site, North distribution route)  |  | Unguja   |  |
| 5   | Sep-10 | Thu               | ·Discussion with MWCEL and ZECO (Environment and Social Consideration)<br>·Site survey (North distribution route, new Welezo S/S site)   | (Shibata)<br>·Same as left<br>·Meeting with Local Contractor (Environmental and Social Consideration)  | Unguja   |  |
| 6   | Sep-10 | Fri               | ·Discussion with MWCEL, ZECO, Department of Road (DoR), Department of Environment (DoE)<br>·Site Survey (South distribution route)   | (Shibata)<br>·Same as left<br>·Environment and Social Consideration Survey   | Unguja   |  |
| 7   | Sep-10 | Sat               | ·Discussion with ZECO<br>·Site Survey (Fumba distribution route)   | (Kondo, Imai)<br>Trip [Narita 21:40 Dubai 03:30+1, JL5095]   | Unguja on Flight (Kondo, Imai)   |  |
| 8   | Sep-10 | Sun               | ·Internal Meeting and Sorting of the Collecting Data<br>(Kondo, Imai)<br>Trip [Dubai 10:50 Dar es Salaam 15:20, EK725]<br>Trip [Dar es Salaam 17:20 Zanzibar 17:50, PW715]   |  | Unguja   |  |
| 9   | Sep-10 | Mon               | ·Discussion on Minutes of Discussion (M/D) with MWCEL and ZECO<br>·Site Survey (Project Site and distribution route)   |  | (Shibata)<br>·Same as left<br>·Environment and Social Consideration Survey                                     | Unguja   |
| 10  | Sep-10 | Tue               | ·Signing on Minutes of Discussion (M/D)<br>(JICA, Tanaka, Kondo, Nakagawa)<br>Trip [Zanzibar 17:00 Dar es Salaam 17:30, PW431]   | (Kobayashi, Akatsuka)<br>·same as left<br>·Collection data from ZECO<br>(Imai)<br>·same as left<br>·Preparation for Contract for Sub-Contract Works  | (Shibata)<br>·Same as left<br>·Environment and Social Consideration Survey                                     | Dar es Salaam (JICA, Tanaka, Kondo, Nakagawa) Unguja (Consultant)                  |
| 11  | Sep-10 | Wed               | (JICA, Tanaka, Kondo, Nakagawa)<br>·Report to JICA Tanzania Office and EOJ<br>(JICA: Niwa) Trip [Dar es Salaam 16:50 Dubai 23:20, EK726]<br>(JICA: Takimoto) Trip [Dar es Salaam 14:25 Doha 19:55, QR545]<br>(Tanaka, Kondo, Imai, Nakagawa)<br>·Discussion with MCA-T             | (Imai)<br>Trip [Zanzibar 12:05 Dar es Salaam 12:35, PW421]<br>·Discussion with Contract for Sub-Contract Works (Kobayashi)<br>·Collection data from ZECO<br>·Survey of distribution route (Akatsuka)<br>·Site Survey | (Shibata)<br>·Environment and Social Consideration Survey  | on Flight (JICA) Dar es Salaam (Tanaka, Kondo, Imai, Nakagawa) Unguja (Consultant) |
| 12  | Sep-10 | Thu               | (JICA: Niwa) Trip [Dubai 03:15 Narita 18:00, EK318]<br>(JICA: Takimoto) Trip [Doha 01:05 Narita 19:30, QR802]<br>(Tanaka, Kondo, Imai, Nakagawa)<br>·Conclusion of Contract for Sub-Contract Works<br>·Discussion with TANESCO<br>Trip [Dar es Salaam 15:40 Zanzibar 16:10, PW713] | (Kobayashi)<br>·Collection data from ZECO<br>·Survey of distribution route (Akatsuka)<br>·Site Survey  | (Shibata)<br>·Environment and Social Consideration Survey<br>·Collecting data from Government Printer and DoE) | Unguja   |
| 13  | Oct-10 | Fri               | (Tanaka, Kondo, Kobayashi, Imai, Nakagawa, Akatsuka)<br>·Technical Meeting with ZECO<br>·Site survey of Mtoni S/S and ZECO vehicle center<br>·Survey of North distribution route   |  | (Shibata)<br>·Environment and Social Consideration Survey  | Unguja   |
| 14  | Oct-10 | Sat               | (Tanaka, Imai, Shibata, Nakagawa)<br>·Technical meeting with ZECO<br>·Internal meeting and collecting data   | (Kondo, Kobayashi, Akatsuka)<br>·same as left<br>·Survey of distribution route (Mahonda, South route, Fumba route)   | Unguja   |  |
| 15  | Oct-10 | Sun               | ·Internal meeting and collecting data  |  | Unguja   |  |
| 16  | Oct-10 | Mon               | (Tanaka, Kondo, Kobayashi, Imai, Nakagawa, Akatsuka)<br>·Technical Meeting with ZECO<br>·Survey of planed S/S site and distribution routes<br>·Collecting answer of Questionnaire from ZECO  | (Shibata)<br>·Environment and Social Consideration Survey  | Unguja   |  |
| 17  | Oct-10 | Tue               | (Tanaka, Kondo, Kobayashi, Imai, Nakagawa, Akatsuka)<br>·Technical meeting with ZECO<br>·Survey of planed S/S site and distribution routes   | (Shibata)<br>·Environment and Social Consideration Survey  | Unguja   |  |
| 18  | Oct-10 | Wed               | (Tanaka)<br>·Courtesy call to related ministry   | (Kondo, Kobayashi, Imai, Nakagawa, Akatsuka)<br>·Survey of planed S/S site and distribution routes<br>·Preparation of Route Map  | (Shibata)<br>·Environment and Social Consideration Survey  | Unguja   |
| 19  | Oct-10 | Thu               | (Tanaka, Kondo, Kobayashi, Akatsuka)<br>·Technical meeting with ZECO<br>·Survey of planed S/S site and distribution routes<br>·Preparation of Route Map  | (Imai, Nakagawa)<br>·Survey of Port  | (Shibata)<br>·Environment and Social Consideration Survey  | Unguja   |

| No. | Date   | A day of the week | Contents of Survey   |   |  | Stay at  |           |
|-----|--------|-------------------|--|---|--|--|-----------|
|     |        |                   | JICA (Niwa, Takimoto) and Consultant (Tanaka, Kondo, Kobayashi, Imai, Shibata, Nakagawa, Akatsuka)   |   |  |  |           |
| 20  | Oct-10 | Fri               | (Tanaka,Kobayashi,Nakagawa)<br>Trip [Zanzibar 09:45 Pemba 10:15, Zan Air]<br>· Courtesy call to ZECO Pemba office<br>· Survey of existing ABC distribution route<br>· Survey of existing P/S and S/S<br>Trip [Pemba 16:45 Zanzibar 17:15, Zan Air] | (Kondo,Imai,Akatsuka)<br>· Survey of S/S site, distribution route (Fumba), turning points and location of distribution transformers | (Shibata)<br>· Environment and Social Consideration Survey                         | Unguja   |           |
| 21  | Oct-10 | Sat               | · Preparation of Technical Memorandum  |   |  | Unguja   |           |
| 22  | Oct-10 | Sun               | (Tanaka,Kondo,Kobayashi,Shibata,Nakagawa,Akatsuka)<br>· Preparation of Technical Memorandum<br>· Internal Meeting  | (Imai)<br>· Witness of Sub-contractor   |  | Unguja   |           |
| 23  | Oct-10 | Mon               | (Tanaka,Kondo,Kobayashi,Nakagawa,Akatsuka)<br>· Discussion on Technical Memorandum with ZECO<br>· Additional Survey of S/S and distribution routes<br>· Preparation of Route Map<br>· Survey of development plan for Unguja island                 | (Imai)<br>· Witness of Sub-contractor   | (Shibata)<br>· Environment and Social Consideration Survey<br>· Preparation of EIA | Unguja   |           |
| 24  | Oct-10 | Tue               | (Tanaka,Kondo,Kobayashi,Nakagawa,Akatsuka)<br>· Discussion on Technical Memorandum with ZECO<br>· Additional Survey of S/S and distribution routes<br>· Preparation of Route Map<br>· Survey of development plan for Unguja island                 | (Imai)<br>· Witness of Sub-contractor<br>· Preparation of Drawing Map   | (Shibata)<br>· Environment and Social Consideration Survey<br>· Preparation of EIA | Unguja   |           |
| 25  | Oct-10 | Wed               | (Tanaka,Kondo,Nakagawa)<br>Trip [Zanzibar 08:00 Dar es Salaam 8:20, Coastal Air]<br>· Discussion with MCA-T and TANESCO<br>Trip [Dar es Salaam 17:45 Zanzibar 18:05, Coastal Air]  | (Kobayashi,Akatsuka)<br>· Technical Meeting with ZECO<br>· Additional Survey of S/S and distribution routes                         | (Imai)<br>· Witness of Sub-contractor<br>· Preparation of Drawing Map              | (Shibata)<br>· Environment and Social Consideration Survey |           |
| 26  | Oct-10 | Thu               | (Tanaka,Nakagawa,Akatsuka)<br>· Technical Meeting with ZECO  | (Kondo,Kobayashi)<br>· Same as left<br>· Collecting data  | (Imai)<br>· Witness of Sub-contractor<br>· Preparation of Drawing Map              | (Shibata)<br>· Environment and Social Consideration Survey |           |
| 27  | Oct-10 | Fri               | (Tanaka,Kondo,Kobayashi,Nakagawa,Akatsuka)<br>· Submission and Explanation on Technical Memorandum with ZECO   | (Imai)<br>· Witness of Sub-contractor   | (Shibata)<br>· Environment and Social Consideration Survey<br>· Discussion on EIA  | Unguja   |           |
| 28  | Oct-10 | Sat               | (Tanaka,Kondo,Kobayashi,Nakagawa,Akatsuka)<br>· Discussion on Technical Memorandum with ZECO<br>· Internal Meeting and collecting data   | (Imai)<br>· Witness of Sub-contractor   | (Shibata)<br>· Environment and Social Consideration Survey<br>· Discussion on EIA  | Unguja   |           |
| 29  | Oct-10 | Sun               | (Tanaka,Kondo,Kobayashi,Nakagawa,Akatsuka)<br>· Discussion on Technical Memorandum with ZECO<br>· Internal Meeting and collecting data   | (Imai)<br>· Witness of Sub-contractor   | (Shibata)<br>· Environment and Social Consideration Survey<br>· Discussion on EIA  | Unguja   |           |
| 30  | Oct-10 | Mon               | · Signing of Technical Memorandum with ZECO<br>· Discussion with MWCEL   |   |  | (Shibata)<br>· Environment and Social Consideration Survey | Unguja    |
| 31  | Oct-10 | Tue               | · Discussion with ZECO CEO and MWCEL   |   |  | Unguja   |           |
| 32  | Oct-10 | Wed               | · Meeting with NORAD<br>Trip [Zanzibar 17:00 Dar es Salaam 17:30, PW431]   |   |  | Dar es Salaam  |           |
| 33  | Oct-10 | Thu               | · Discussion with TANESCO  |   |  | (Shibata) Supporting of preparation of EIA report          |           |
| 34  | Oct-10 | Fri               | · Discussion with JICA Tanzania Office and SIDA<br>· Market Survey   | (Shibata)<br>· Discussion on EIA with related organizations   | (Imai)<br>· Same as left<br>Trip [Dar es Salaam 16:50 Dubai 23:20, EK726]          | Dar es Salaam on Flight (Kobayashi,Imai)                   |           |
| 35  | Oct-10 | Sat               | · Internal meeting and collecting data   | (Kobayashi)<br>· Same as left<br>Trip [Dar es Salaam 16:50 Dubai 23:20, EK726]  | (Imai)<br>Trip [Dubai 03:15 Narita 18:00, JL5096]                                  | Dar es Salaam  |           |
| 36  | Oct-10 | Sun               | · Internal meeting and collecting data   |   | (Kobayashi)<br>Trip [Dubai 03:15 Narita 18:00, JL5096]                             | Dar es Salaam  |           |
| 37  | Oct-10 | Mon               | · Reporting to EOJ/JICA<br>Trip [Dar es Salaam 16:50 Dubai 23:20, EK726]   |   |  |  | on Flight |
| 38  | Oct-10 | Tue               | Trip [Dubai 03:10 Kansai 17:20, JL5090 & EK316]<br>Trip [Kansai 19:15 Haneda 20:25, JL188 & EK6252]  |   |  |  |           |

(2) 2<sup>nd</sup> Field Survey

| No. | Date   | A day of the week | Contents of Survey   | Stay at   |
|-----|--------|-------------------|--|-----------|
|     |        |                   | Consultant (Shibata)   |           |
| 1   | 26-Nov | Fri               | Trip [Narita 20:50 Doha 05:10+1, QR 803]   | on Flight |
| 2   | 27-Nov | Sat               | Trip [Doha 7:20 Dar es Salaam 13:15, QR544]<br>Trip [Dar es Salaam 15:40 Zanzibar 16:10 by PW713]<br>· Meeting with Institutions Concerned | Unguja    |
| 3   | 28-Nov | Sun               | · Sorting of the Collecting Data<br>· Meeting with the local consultant  | Unguja    |
| 4   | 29-Nov | Mon               | · Courtesy call and Discussion with ZECO and DoE   | Unguja    |
| 5   | 30-Nov | Tue               | · Courtesy call and Discussion with ZECO<br>· Site Survey (Kiwani Bay)   | Unguja    |
| 6   | 1-Dec  | Wed               | · Stake Holder Meeting (Mwera, Mtofaani, Magogoni)   | Unguja    |
| 7   | 2-Dec  | Thu               | · Stake Holder Meeting (Jumbi)   | Unguja    |
| 8   | 3-Dec  | Fri               | · Stake Holder Meeting (Chuini, Mfenesini, Kitope)   | Unguja    |
| 9   | 4-Dec  | Sat               | · Stake Holder Meeting (Mahonda, Mkataleni, Fumba, Bweleo)   | Unguja    |
| 10  | 5-Dec  | Sun               | · Stake Holder Meeting (Maungani, Dimani, Kombeni, Kisauni)  | Unguja    |
| 11  | 6-Dec  | Mon               | · Stake Holder Meeting (Ubago)   | Unguja    |
| 12  | 7-Dec  | Tue               | · Meeting with ZECO & DoE<br>· Collecting Data (Vice President Office)   | Unguja    |
| 13  | 8-Dec  | Wed               | · Meeting with MWCET, ZECO & DoE<br>· Collecting Data  | Unguja    |
| 14  | 9-Dec  | Thu               | · Site Survey (Tungu)  | Unguja    |
| 15  | 10-Dec | Fri               | Trip [Zanzibar 08:50 Dar es Salaam 09:20 by PW451]<br>· Report to JICA Tanzania Office, EOJ  | Unguja    |
| 16  | 11-Dec | Sat               | · Additional Survey  | Unguja    |
| 17  | 12-Dec | Sun               | · Additional Survey<br>Trip [Dar es Salaam 14:25 Dubai 20:00, QR545]   | Dubai     |
| 18  | 13-Dec | Mon               | Trip [Dubai 01:10 Kansai 19:05, QR802]   |           |



(3) 3<sup>rd</sup> Field Survey (Explanation of Draft Final Report)

| No. | Date   | A day of the week | Contents of Survey   |  |  |  | Stay at   |   |
|-----|--------|-------------------|--|--|--|--|---|---|
|     |        |                   | JICA   |  | Consultant   |  |   |   |
|     |        |                   | Niwa   | Takimoto   | Fujii  | Nakagawa<br>Shibata  |   |   |
| 1   | 20-Jan | Thu               | /  | /  | Trip [Narita 22:00 Dubai 04:55+1, EK319]   |  | in flight (Fujii, Nakagawa, Shibata)                                    |   |
| 2   | 21-Jan | Fri               |  |  | Trip [Dubai 10:50 Dar es Salaam 15:20, EK725]<br>Trip [Dar es Salaam Zanzibar]                                     |  | Unguja (Fujii, Nakagawa, Shibata)                                       |   |
| 3   | 22-Jan | Sat               |  |  | ·Courtesy call to ZECO<br>·Site Survey (Existing Substations, Proposed Substations and Existing Distribution Line) |  | Unguja (Fujii, Nakagawa, Shibata)                                       |   |
| 4   | 23-Jan | Sun               | Trip [Narita Doha]   | Trip [Narita Doha]   | ·Site Survey (Existing Distribution Line)  |  | in flight (Unguja)  |   |
| 5   | 24-Jan | Mon               | Trip [Doha Dar es Salaam]<br>Trip [Dar es Salaam Zanzibar]   | Trip [Doha Dar es Salaam]<br>Trip [Dar es Salaam Zanzibar]                     | ·Explanation of Draft Outline Design Report  |  | Unguja (All)  |   |
| 6   | 25-Jan | Tue               | ·Explanation of Draft Outline Design Report (Components and Implementation Schedule)                         |  |  |  | Unguja (All)  |   |
| 7   | 26-Jan | Wed               | ·Discussion on Minutes of Discussion (M/D) with MWCEL and ZECO   |  | ·Stake Holder Meeting with Institution Concerned   |  | Unguja (All)  |   |
| 8   | 27-Jan | Thu               | ·Discussion and Signing on Minutes of Discussion (M/D) with MWCEL and ZECO<br>·Trip [Zanzibar Dar es Salaam] |  | ·Site Survey for Distribution Line<br>·Meeting with ZECO about Situation of Other Donor's Assistance, EIA and RAP  |  | Dar es Salaam (Niwa, Takimoto, Fujii)<br>Unguja (Nakagawa, Shibata)     |   |
| 9   | 28-Jan | Fri               | ·Report to JICA Tanzania Office, EOJ   |  | ·Site Survey for Distribution Line<br>·Meeting with ZECO about Situation of Other Donor's Assistance, EIA and RAP  |  | Dar es Salaam (Takimoto)<br>in flight (Niwa, Fujii)<br>Unguja (Shibata) |   |
|     |        |                   | Trip [Dar es Salaam Doha]  | Meeting on Technical Assistance Project  | Trip [Dar es Salaam 17:20 Dubai 23:50, EK 726]   | Trip [Zanzibar Dar es Salaam]  |   |   |
| 10  | 29-Jan | Sat               | Trip [Doha Anman]  | Trip [Dar es Salaam Doha]  | Trip [Dubai 02:50 Narita 17:20, EK318]   | ·Meeting with local consultant in Dar es Salaam<br>Trip [Dar es Salaam 17:20 Dubai 23:50, EK726] | ·Meeting with ZECO about EIA and RAP                                    | Inflight (Takimoto, Nakagawa)<br>Unguja (Shibata) |
| 11  | 30-Jan | Sun               | /  | Trip [Doha Anman]  | /  | Trip [Dubai 02:50 Narita 17:20, EK318]   | ·Preparation of site survey report                                      | Unguja (Shibata)                                  |
| 12  | 31-Jan | Mon               |  | ·Meeting with ZECO about EIA and RAP   |  | Unguja (Shibata)   |   |   |
| 13  | 1-Feb  | Tue               |  | ·Meeting with ZECO about EIA and RAP   |  | Unguja (Shibata)   |   |   |
| 14  | 2-Feb  | Wed               |  | Trip [Zanzibar Dar es Salaam]<br>Trip [Dar es Salaam 17:20 Dubai 23:50, EK726] |  | in flight (Shibata)  |   |   |
| 15  | 3-Feb  | Thu               |  | Trip [Dubai 02:50 Narita 17:20, EK318]   |  | /  |   |   |

## **APPENDIX 3**

### **LIST OF PARTIES CONCERNED IN THE RECIPIENT COUNTRY**

### 3. List of Parties Concerned in the Recipient Country

| <u>Name of Organization</u>                                  | <u>Position</u>                                 |
|--|---|
| <b>Ministry of Lands, Housing, Water and Energy (MLHWE)</b>  |   |
| Mr. Mwalim A. Mwalim   | Principal Secretary                             |
| Mr. Mwalim A. Mwalim   | Principal Secretary                             |
| Mr. Tahir M. K. Abdullah                                     | Deputy Principal Secretary                      |
| Mr. Haji Adam Haji   | Director of Surveys & Urban Planning Department |
| <b>Ministry of Agriculture, Livestock and Environment</b>    |   |
| Mr. Ali J. Hamad   | Director of Environment                         |
| Ms. Asha A. Khatib   | Chief Environment Officer                       |
| Ms. Zaituni M. Haji  | Legal Officer                                   |
| Mr. Makame M. Haji   | EIA Officer                                     |
| <b>Ministry of Communications and Transport</b>              |   |
| Mr. Ali T. Fatawi  | Director of Roads                               |
| Mr. Suleiman A. Ali  | Maintenance Engineer                            |
| <b>Ministry of Finance, Economy and Development Planning</b> |   |
| Mr. Khamis M. Omar   | Principal Secretary                             |
| Mr. Peter E. Kigadye   | Energy Project Officer (MCA-T Project)          |
| <b>Zanzibar Electricity Corporation (ZECO)</b>               |   |
| Mr. Mohammed Hashim Ismail                                   | Chairman, ZECO Board of Directors               |
| Mr. Haji Kali Haji   | Director, ZECO Board                            |
| Mr. Hassan Ali Mbarouk                                       | Acting General Manager                          |
| Mr. Khamis Haji Juma   | Administration Manager                          |
| Mr. Faki H. Ali  | Zonal Engineer (Urban West)                     |
| Mr. Thabit Salum   | Project Coordinator of MCA-T Project            |
| Mr. Haji Silima  | Zonal Engineer (North)                          |
| Mr. Ally Khamis Ally   | Budgets & Statistics Officer                    |
| Mr. Rafii H. Mtumwa  | Assistant Budgets & Statistics Officer          |
| Mr. Mohammed Juma Othman                                     | Project Coordinator of JICA Project             |
| Mr. Shariff S. Rajab   | Civil Engineer                                  |

|                        |                          |
|------------------------|--------------------------|
| Mr. Maulid Shiraz      | Distribution Engineer    |
| Mr. Khamis J. Khamis   | Acting Planning Engineer |
| Mr. Mussa Ali Mussa    | Acting Operation Manager |
| Ms. Riziki F. Hamad    | Acting Finance Manager   |
| Mr. Issa Oman Mohammed | Prepaid Meter Manager    |

**Zanzibar Investment Promotion Authority**

|                          |  |
|--------------------------|--|
| Mr. Saleh Suleiman Hamad | Director of Infrastructure and Free Zone Development |
| Mr. Aziz B. Ali          | Freeport Development Manager                         |

**Zanzibar Water Authority**

|                              |                                  |
|------------------------------|----------------------------------|
| Mr. Ali Abdu Ali             | Electrical & Electronic Engineer |
| Mr. Mohammed Ilyasa Mohammed | Planning & Design Engineer       |

**Tanzania Electric Supply Company ltd (TANESCO)**

|                     |                                  |
|---------------------|----------------------------------|
| Mr. Khalid R. James | Senior Projects Engineer         |
| Mr. John F. Sakia   | Project Manager (Zanzibar Cable) |

**MCA-T Project**

|                |   |
|----------------|---|
| Mr. Johan Swan | Deputy Project Director of ESBI Consultants |
|----------------|---|

**Zanzibar Ports Corporation**

|                         |                                    |
|-------------------------|------------------------------------|
| Mr. Mohammed Salum Ali  | Director of Operations & P.F.S.O   |
| Mr. Mohammed S. Mbarouk | Assistant of Director of Operation |
| Mr. Kudaid Khatib       | Senior Operation Officer           |

**Concerned Parties of NORAD**

|                           |  |
|---------------------------|--|
| Mr. Ørnulf Strøm          | Counsellor, Energy and Infrastructure, Norwegian Embassy |
| Ms. Ingeranette S. Dahlen | Energy Advisor, NORAD, OSLO                              |
| Ms. Solveig Uleseth       | Natural Resources and Renewable Energy Division, NORPLAN |
| Mr. Hilmar Sandvik        | Grid Technology Manager, Skagerak Energi                 |

**Embassy of Sweden**

Mr. Stephen Mwakifwamba

Programme Officer Energy

**Others (Factories, Schools, Hospitals)**

Dr. Haroub Yussuf

Dr. Incharge of Zanzibar Military Hospital

Ms. Hamida A. Mohammed

Deputy Vice Chancellor Administrator of Zanzibar University

Mr. Abdul J. Hamad

Estate Engineer of Zanzibar University

Mr. Mustuk

Electrician of Fiber Glass Factory

**Embassy of Japan in Tanzania**

Mr. Hiroshi Nakagawa

Ambassador

Mr. Yukinori Seki

Second Secretary

**JICA Tanzania Office**

Mr. Yukihide Katsuta

Chief Representative

Mr. Toshihisa Hasegawa

Senior Representative

Mr. Shin Maruo

Representative

Mr. Minako Yamamoto

Representative

Mr. Tomoko Tauchi

Programme Advisor, Infrastructure

## **APPENDIX 4**

### **MINUTE OF DISCUSSIONS**

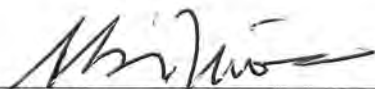
**Minutes of Discussions  
on 2<sup>nd</sup> Preparatory Survey on the Project for  
the Reinforcement of Power Distribution in Zanzibar Island  
in the United Republic of Tanzania**

In response to the request from the Government of the United Republic of Tanzania (hereinafter referred to as "Tanzania"), the Japan International Cooperation Agency (hereinafter referred to as "JICA"), in consultation with the Government of Japan, decided to conduct a 2<sup>nd</sup> Preparatory Survey (hereinafter referred to as "the Survey") on the Project for the Reinforcement of Power Distribution in Zanzibar Island (hereinafter referred to as "the Project").

JICA sent to Tanzania the 2<sup>nd</sup> Preparatory Survey Team (hereinafter referred to as "the Team"), headed by Dr. Akira NIWA, Department of Human Resources for International Cooperation, JICA. The Team is scheduled to stay in the Zanzibar Island from September 21 to October 20, 2010.

The Team held discussions with the officials of Tanzanian authorities concerned (hereinafter referred to as "the Tanzania side"). In the course of the discussions, both sides have confirmed the main items described in the sheets attached hereto.

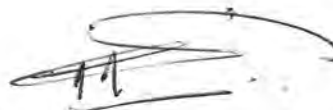
Zanzibar Island, September 28, 2010



Dr. AKIRA NIWA  
Leader  
2<sup>nd</sup> Preparatory Survey Team  
Japan International Cooperation Agency



Mr. MWALIM A. MWALIM  
Principal Secretary  
Ministry of Water, Construction, Energy and Lands  
The Revolutionary Government of Zanzibar  
The United Republic of Tanzania



Mr. HASSAN A. MBAROUK  
Acting General Manager  
Zanzibar Electricity Corporation

*Han*

## ATTACHMENT

### 1. Objective of the Project

The objective of the Project is to rehabilitate the substations and distribution network in Zanzibar Island.

### 2. Project Site

The Project sites which are selected through the 2<sup>nd</sup> Preparatory Survey and the analysis in Japan based on the request from the Tanzania side are located in Unguja Island of Zanzibar as shown in Annex-1.

### 3. Responsible and Implementing Organization

- (1) The responsible ministry is Ministry of Water, Construction, Energy and Land (MWCEL).
- (2) The implementing organization is Zanzibar Electricity Corporation (ZECO).
- (3) The Organization Structure of MWCEL and ZECO are shown in Annex-2 and Annex-3.

### 4. Result of Analysis on 2<sup>nd</sup> Preparatory Survey

JICA explained the result of analysis on 2<sup>nd</sup> Preparatory Survey in Japan to the Tanzania side. Based on the analysis, JICA determine the priority for the following component for the Project.

- |  |   |
|--|---|
| (1) Expansion of 33 kV Mtoni Substation                            | A |
| (2) Installation of 33/11 kV Substation at Welezo                  | C |
| (3) Installation of 33/11 kV Substation at Mwanyanya               | B |
| (4) Installation of 33 kV Distribution line from Mtoni to Tunguu   | C |
| (5) Installation of 33 kV Distribution line from Mtoni to Mahonda  | B |
| (6) Replacement of 33 kV Distribution line from Mtoni to Fumba     | C |
| (7) Material Supply from JICA for the construction excused by ZECO | D |

The Team explained that the requested (7) components are considered as candidate components to be implemented; However, the components might be reduced due to the budget constraints of the Japanese side.

### 5. Japan's Grant Aid Scheme

- (1) JICA confirmed that the Tanzania side understood Japan's Grant Aid Scheme explained by the Team at the 2<sup>nd</sup> Preparatory Survey as described in Annex-4.
- (2) The Tanzania side will take the necessary measures, as described in Annex-5, for smooth implementation of the Project as prerequisites for the Japan's Grant Aid to be implemented.

### 6. Schedule of the 2<sup>nd</sup> Preparatory Survey

The Team will continue the Survey in Tanzania until October 26, 2010.

### 7. Other Relevant Issues

#### (1) Status of the 2<sup>nd</sup> Preparatory Survey

The Team explained that the purpose of the Survey is to collect information and data necessary for the outline design and cost calculation of the Project components which are confirmed through the 2<sup>nd</sup> Preparatory Survey and the analysis in Japan.

#### (2) Submission of the Questionnaire

The Tanzania side shall submit answers to the Questionnaire given by the Team **before October 4, 2010.**



(3) Coordination among relevant donors and agencies

The Team requested the Tanzania side to ensure coordination among relevant donors and agencies for smooth implementation of the Project.

(4) Environmental and Social Considerations

- a) The Team requested the Tanzania side to ensure access to the site and undertake expropriation if necessary in order to secure the project site.
- b) The Team requested the Tanzania side to conduct the required environmental works, and obtain approval on environmental clearance for implementation of the Project
- c) The Tanzania side agreed to comply with the JICA Guidelines for Environmental and Social Considerations (hereinafter referred to as "JICA Guidelines") as well as Zanzibar laws and regulations, and requested to prepare Environmental Checklist and Monitoring Form which are designated by JICA Guidelines for an outline design. The Tanzania side agreed to make necessary arrangements with governmental organizations concerned in order to secure funding for and execution of the above environmental matters in a schedule as required for smooth execution of the Project.
- d) The Tanzania side agreed to modify former EIA for the finalized distribution routes. The Team requested the Tanzania side to prepare full scale resettlement action plan (Full RAP) in accordance with Zanzibar Laws and JICA Guidelines and to implement resettlement activity as per Full RAP.
- e) The Tanzania side agreed to make necessary arrangements with governmental organizations concerned in order to secure funding for and execution of the above environmental matters in a schedule as required for smooth execution of the Project.
- f) The Tanzania side agreed to complete EIA by the end of November 2010.
- g) The Tanzania side agreed that RAP shall be approved by the Tanzanian government by the end of December 2010 as described in Annex-6.

(5) Temporary Work Arrangement

Securing temporary space of a winch and a drum for the installation works of distribution line and traffic controls shall be done by the Tanzania side.

(6) Counterpart Personnel

The Team requested the Tanzania side that necessary number of counterpart personnel shall be assigned to the Team and necessary arrangements with related organizations shall be made during the Survey in Tanzania.

(7) Major Undertakings to be taken by the Tanzania side

- a) The Tanzania side agreed to undertake the following particular items out of general undertakings described in Annex-7.  
The cost for RAP and compensation shall be paid by the Tanzania side.
- b) The Tanzania side shall take necessary measures for obtaining the permissions as below in prior to the commencement of the implementation of the project
  - Permission(s) necessary for installation works
  - Permission(s) necessary for entering into the restricted areas
- c) The Tanzania side shall secure enough budget and human resources for the following undertakings in accordance with the implementation of the Project
  - Securing ownership of the land for the proposed 33kV distribution lines and Substations.
  - Securing access road for transportation of the equipment and materials to the proposed Mwanyanya Substation and 33kV distribution lines including removal work of obstacles.
  - Bush clearing along the proposed 33kV distribution lines and access road
  - Relocating existing telephone line of the proposed Welezo Substation.

(End)

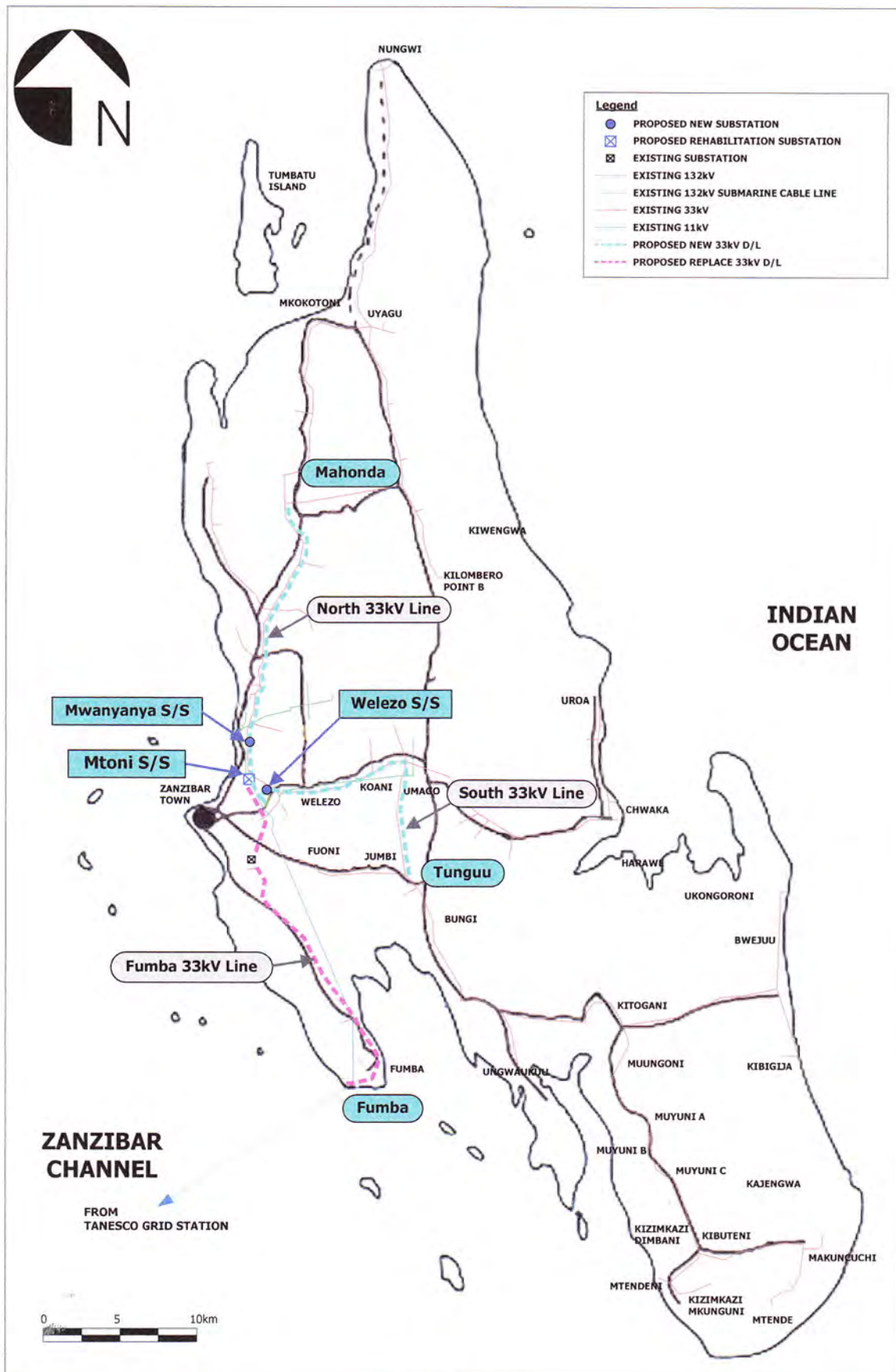
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- Annex-1 Project Sites
- Annex-2 Organization Chart of MWCEL
- Annex-3 Organization Chart of ZECO
- Annex-4 Japan's Grant Aid
- Annex-5 Flow Chart of Japan's Grant Aid Procedures
- Annex-6 Time Schedule of Resettlement Activities
- Annex-7 Major Undertakings to be taken by Each Government

①

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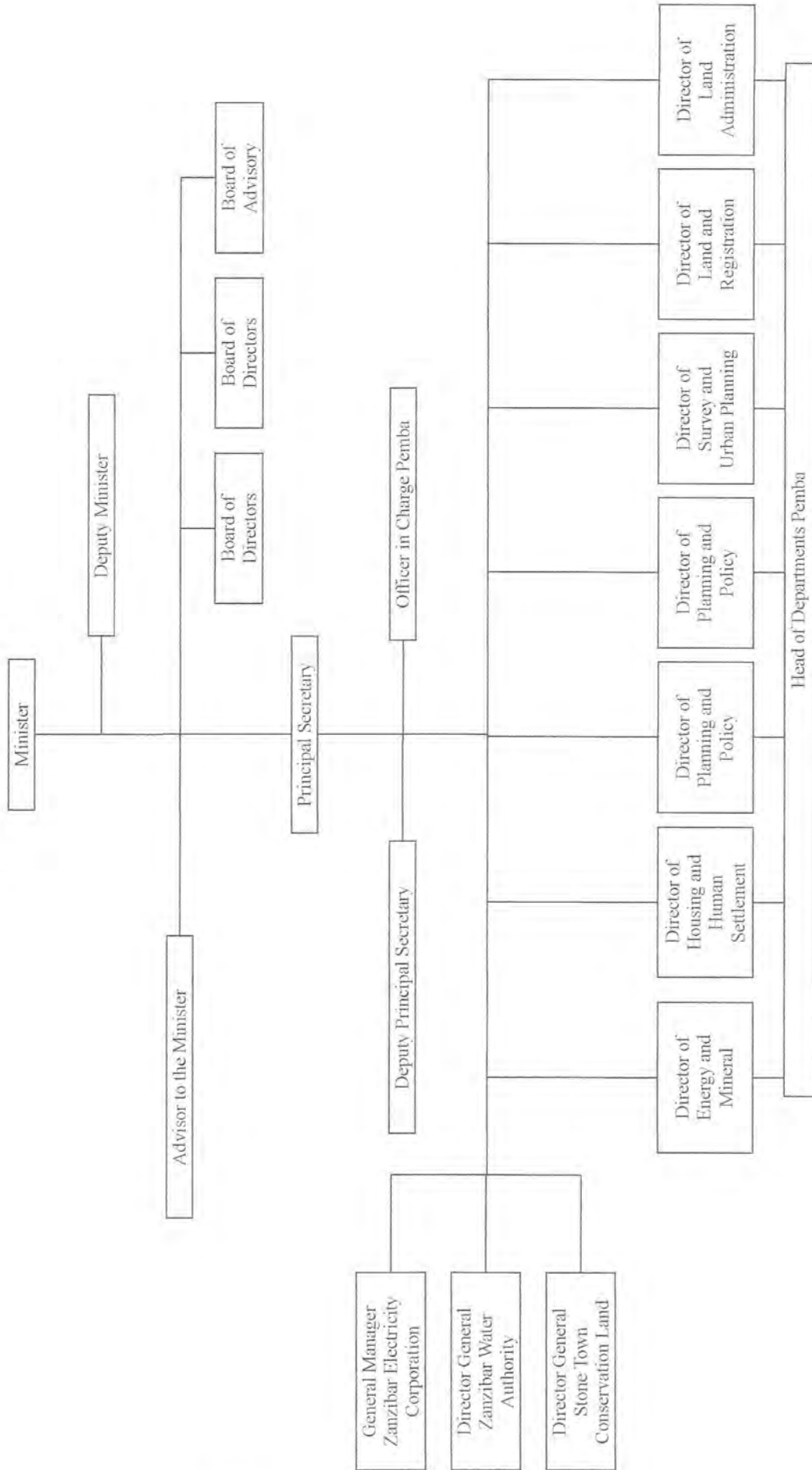
Project Sites



PROJECT SITES

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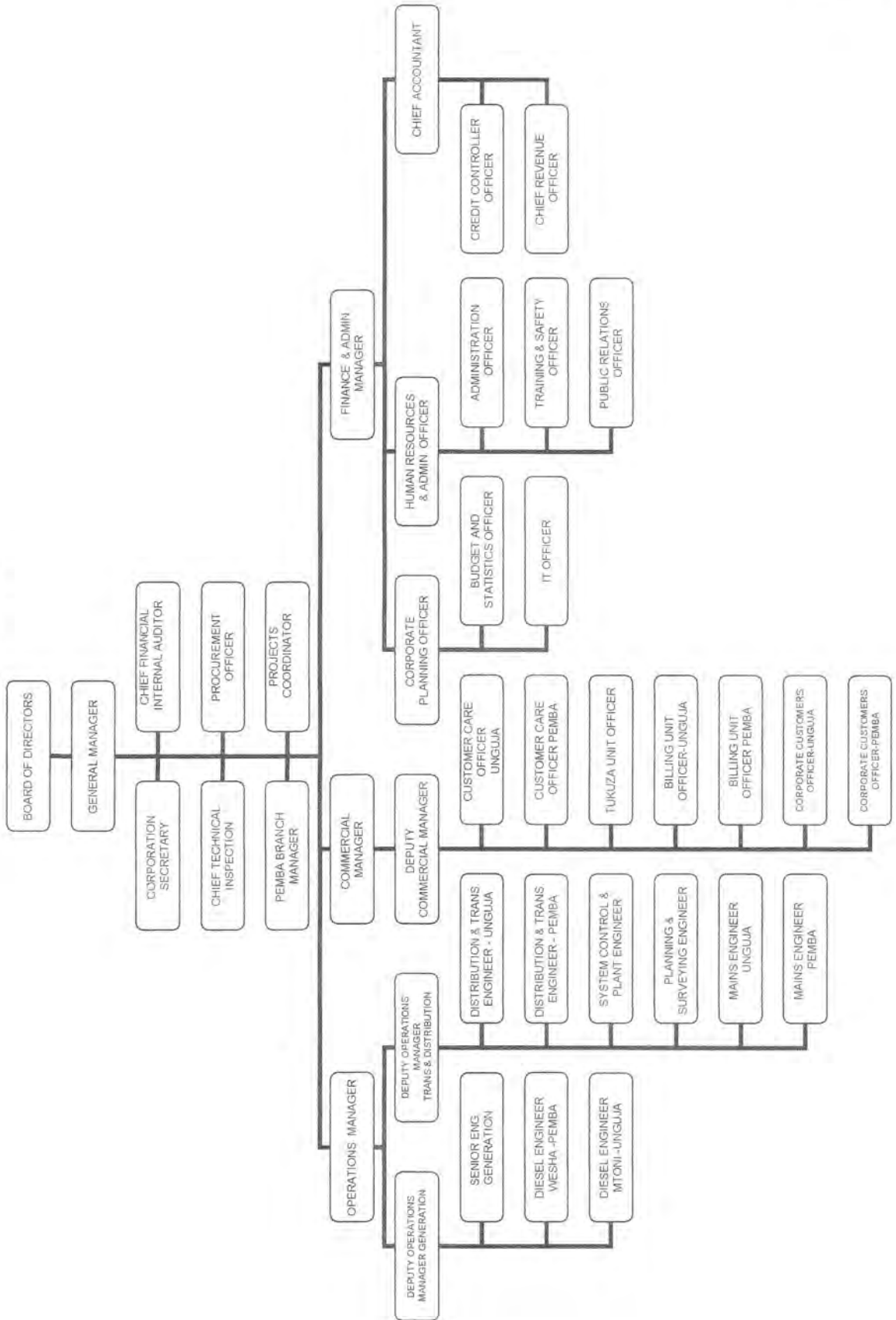
Organization Chart of MWCEL



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**Organization Chart of ZECO**



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## Japan's Grant Aid

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

### **1. Grant Aid Procedures**

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal & Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

### **2. Preparatory Survey**

#### (1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.





- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

## (2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

## (3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

## 3. Japan's Grant Aid Scheme

### (1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

### (2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

### (3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

A-5

A-4-9

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

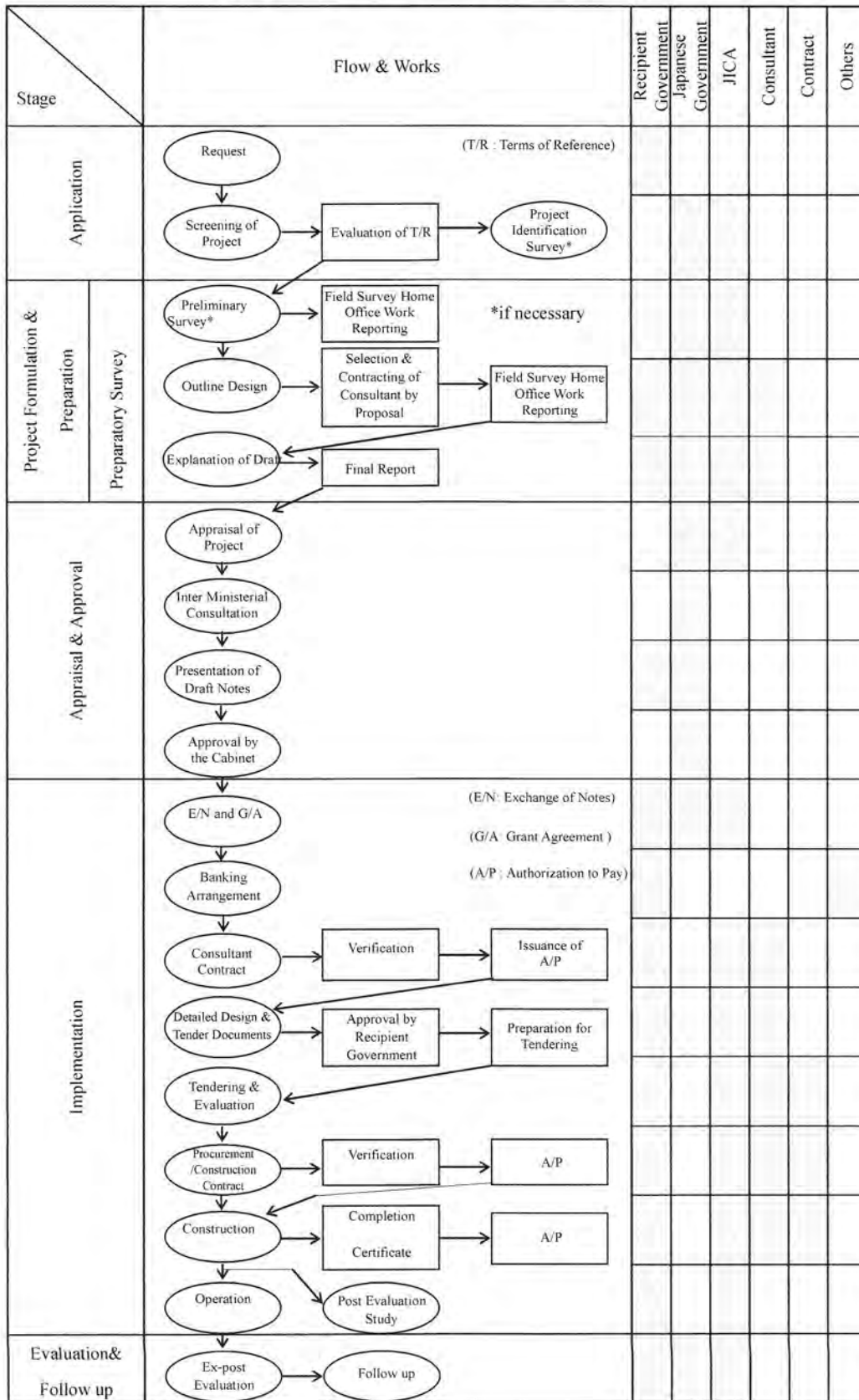
(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

(End)



Flow Chart of Japan's Grant Aid Procedures





## Major Undertakings to be taken by Each Government

| No. | Items  | To be covered by Grant Aid | To be covered by Recipient side |
|-----|--|----------------------------|---------------------------------|
| 1   | to secure [a lot] /[lots] of land necessary for the implementation of the Project and to clear the [site]/[sites];   |                            | ●                               |
| 2   | To construct the following facilities  |                            |                                 |
|     | 1) The building  | ●                          |                                 |
|     | 2) The gates and fences in and around the site   |                            | ●                               |
|     | 3) The parking lot   | ●                          |                                 |
|     | 4) The road within the site  | ●                          |                                 |
|     | 5) The road outside the site   |                            | ●                               |
| 3   | To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the [site]/[sites]  |                            |                                 |
|     | 1)Electricity  |                            |                                 |
|     | a. The distributing power line to the site   |                            | ●                               |
|     | b. The drop wiring and internal wiring within the site   | ●                          |                                 |
|     | c. The main circuit breaker and transformer  | ●                          |                                 |
|     | 2) Water Supply  |                            |                                 |
|     | a. The city water distribution main to the site  |                            | ●                               |
|     | b. The supply system within the site (receiving and elevated tanks)  | ●                          |                                 |
|     | 3) Drainage  |                            |                                 |
|     | a. The city drainage main (for storm sewer and others to the site)   |                            | ●                               |
|     | b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site   | ●                          |                                 |
|     | 4) Gas Supply  |                            |                                 |
|     | a. The city gas main to the site   |                            | ●                               |
|     | b. The gas supply system within the site   | ●                          |                                 |
|     | 5) Telephone System  |                            |                                 |
|     | a. The telephone trunk line to the main distribution frame/panel (MDF) of the building   |                            | ●                               |
|     | b. The MDF and the extension after the frame/panel   | ●                          |                                 |
|     | 6) Furniture and Equipment   |                            |                                 |
|     | a. General furniture   |                            | ●                               |
|     | b. Project equipment   | ●                          |                                 |
| 4   | To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products   |                            |                                 |
|     | 1) Marine (Air) transportation of the Products from Japan to the recipient country   | ●                          |                                 |
|     | 2) Tax exemption and custom clearance of the Products at the port of disembarkation  |                            | ●                               |
|     | 3) Internal transportation from the port of disembarkation to the project site   | ●                          |                                 |
| 5   | To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services [ be exempted] / [be borne by the Authority without using the Grant]       |                            | ●                               |
| 6   | To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work |                            | ●                               |
| 7   | To ensure that [the Facilities and the products]/[the Facilities]/ [the products] be maintained and used properly and effectively for the implementation of the Project  |                            | ●                               |
| 8   | To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project   |                            | ●                               |
| 9   | To bear the following commissions paid to the Japanese bank for banking services based upon the B/A  |                            |                                 |
|     | 1) Advising commission of A/P  |                            | ●                               |
|     | 2) Payment commission  |                            | ●                               |
| 10  | To give due environmental and social considerations in the implementation of the Project.  |                            | ●                               |

\*1 B/A : Banking Arrangement, A/P : Authorization to pay)

**Minutes of Discussions  
on 3<sup>rd</sup> Preparatory Survey on the Project for  
the Reinforcement of Power Distribution in Zanzibar Island  
in the United Republic of Tanzania**

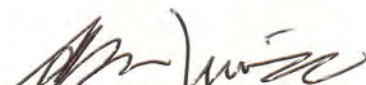
(Explanation on Draft Final Report)


In response to the request from the Government of the United Republic of Tanzania (hereinafter referred to as “Tanzania”), the Japan International Cooperation Agency (hereinafter referred to as “JICA”), in consultation with the Government of Japan, decided to conduct a 3<sup>rd</sup> Preparatory Survey (hereinafter referred to as “the Survey”) on the Project for the Reinforcement of Power Distribution in Zanzibar Island (hereinafter referred to as “the Project”) in order to explain and to consult with the officials of Tanzanian authorities concerned (hereinafter referred to as “Tanzanian side”) on the components of the Draft Final Report.

JICA sent to Tanzania the 3<sup>rd</sup> Preparatory Survey Team (hereinafter referred to as “the Team”), headed by Dr. Akira NIWA, JICA, from January 21, 2011 to February 2, 2011.


In the course of the discussions, both sides have confirmed the main items described in the sheets attached hereto.


Zanzibar Island, January 27, 2011

  
\_\_\_\_\_  
Dr. AKIRA NIWA  
Leader  
3<sup>rd</sup> Preparatory Survey Team  
Japan International Cooperation Agency

  
\_\_\_\_\_  
Mr. MWALIM A. MWALIM  
Principal Secretary  
Ministry of Lands, Housing, Water and Energy  
The Revolutionary Government of Zanzibar  
The United Republic of Tanzania

Witnessed by

  
\_\_\_\_\_  
Mr. HASSAN A. MBAROUK  
Acting General Manager  
Zanzibar Electricity Corporation

  
\_\_\_\_\_  
Mr. KHAMIS M. OMAR  
Principal Secretary  
President Office,  
Finance, Economy and Development Planning  
The Revolutionary Government of Zanzibar  
The United Republic of Tanzania



## ATTACHMENT

### 1. Objective of the Project

The objective of the Project is to reinforce the substations and distribution network in Zanzibar Island in order to improve the living standards of the people of Zanzibar by stable and sufficient electricity supply.

### 2. Contents of the Draft Final Report

Ministry of Lands, Housing, Water and Energy (hereinafter referred to as "MLHWE") and Zanzibar Electricity Corporation (hereinafter referred to as "ZECO") accepted in principle the contents of the Draft Final Report explained by the Team. The Tanzanian side shall inform the Team in writing of the comments on the Draft Final Report and the Draft Technical Specifications by February 28, 2011.

### 3. Components of the Project

The following (1) to (7) are the outline of the Project components selected through 1<sup>st</sup> and 2<sup>nd</sup> Preparatory Survey. Annex-1 shows the location of project sites.

- (1) Expansion of 33 kV Mtoni Substation
- (2) Installation of 33/11 kV Substation at Welezo
- (3) Installation of 33/11 kV Substation at Mwanyanya
- (4) Installation of 33 kV Distribution line from Mtoni to Tunguu
- (5) Installation of 33 kV Distribution line from Mtoni to Mahonda
- (6) Replacement of 33 kV Distribution line from Mtoni to Fumba
- (7) Procurement of construction vehicles, tools and materials for distribution lines

The Team explained that the requested (1) to (7) components are considered as candidate components to be implemented. However, the components might be reduced due to the budget constraints of the Japanese side.

### 4. Japan's Grant Aid Scheme

- (1) JICA confirmed that the Tanzanian side understood Japan's Grant Aid Scheme explained by the Team at the 1<sup>st</sup> and 2<sup>nd</sup> Preparatory Survey as described in Annex-2.
- (2) The Tanzanian side will take necessary measures, as described in Annex-3, for smooth implementation of the Project as prerequisites for the Japan's Grant Aid to be implemented.

### 5. Project Cost

The Tanzanian side agreed that the cost for the Project should not exceed the upper limit of amount agreed on Exchange of Notes (E/N). The Tanzanian side also agreed that the cost for the Project contains procurement cost of equipment, transportation cost up to the Project site, installation cost and the Consultant fees.

### 6. Confidentiality of the Project

- (1) Detailed specifications of the Facilities and Equipment

JICA and the Tanzanian side agreed that all the information related to the Project including detailed drawings and specifications of the facilities and equipment and other technical information shall not be disclosed to any outside parties (i.e. outside of JICA and Tanzanian side) before the conclusion of all contract(s) for the Project.

- (2) Confidentiality of the Cost Estimation

The Team explained the estimated cost of the Project as described in Annex-4. JICA and Tanzanian side agreed that the estimated cost for the Project should never be duplicated or



disclosed to any outside parties (i.e. outside of JICA and Tanzanian side) before tender for the Project. Tanzanian side understood that the estimated cost for the Project attached as Annex-4 is not final and is subject to change as a result of examination through revision of the Outline Design Study.

## 7. Other Relevant Issues

### (1) Status of the 3<sup>rd</sup> Preparatory Survey

The Team explained that the purpose of the Survey is to explain and to consult with Tanzanian side on the components of the Draft Final Report.

### (2) Change the name of Responsible Ministry

Tanzanian side informed that “Ministry of Water, Construction, Energy and Land (MWCEL)” has changed its name to “Ministry of Lands, Housing, Water and Energy (MLHWE)”.

### (3) Coordination among relevant donors and agencies

The Team requested the Tanzanian side to ensure coordination among relevant donors and agencies for smooth implementation of the Project.

### (4) Environmental and Social Considerations

- a) The Team requested the Tanzanian side to ensure access to the site and undertake expropriation if necessary in order to secure the project sites.
- b) The Team requested the Tanzanian side to conduct the required environmental works, and obtain approval on environmental clearance for implementation of the Project
- c) The Tanzania side agreed to comply with the JICA’s Guidelines for Environmental and Social Considerations (hereinafter referred to as “JICA Guidelines”) as well as Zanzibar laws and regulations, and requested to prepare Environmental Checklist and Monitoring Form which are designated by JICA Guidelines for an outline design.
- d) The Team confirmed that EIA (Environmental Impact Assessment) for the Project was approved by the Department of Environment in Zanzibar on December 5<sup>th</sup>, 2010.
- e) The Team requested the Tanzanian side to implement resettlement activities in a timely manner as per RAP (full scale resettlement action plan) which was prepared in accordance with Zanzibar Laws and JICA Guidelines.
- f) The Tanzanian side agreed that Rap shall be approved by the Tanzanian government by the middle of February 2011 and the resettlement of Project Affected People (PAPs) shall be completed by the end of October 2011 as described in Annex-5.
- g) The Tanzanian side agreed to make necessary arrangements with governmental organizations concerned in order to secure funding for and execution of the above environmental and social considerations matters in a schedule as required for smooth implementation of the Project.

### (5) Counterpart Personnel

The Team requested the Tanzanian side that necessary number of counterpart personnel shall be assigned to the Team and necessary arrangements with related organizations be made during the Survey and implementing stage in Tanzania.

### (6) Customs Duties and Tax Exemption

The Tanzania side agreed that MLHWE shall be responsible for the exemption of all customs, tax, levies and duties incurred in Tanzania for the implementation of the Project.

### (7) Major Undertakings to be taken by the Tanzanian side

The Tanzanian side agreed to undertake the following particular items out of general undertakings described in Annex-3.

- a) Securing of land for new substations, distribution lines and material storage.
- b) Land leveling and preparation, weeding and removal of obstacles in the sites
- c) Installation of fences and gates in and around the sites of new substations to be used after completion of Project.

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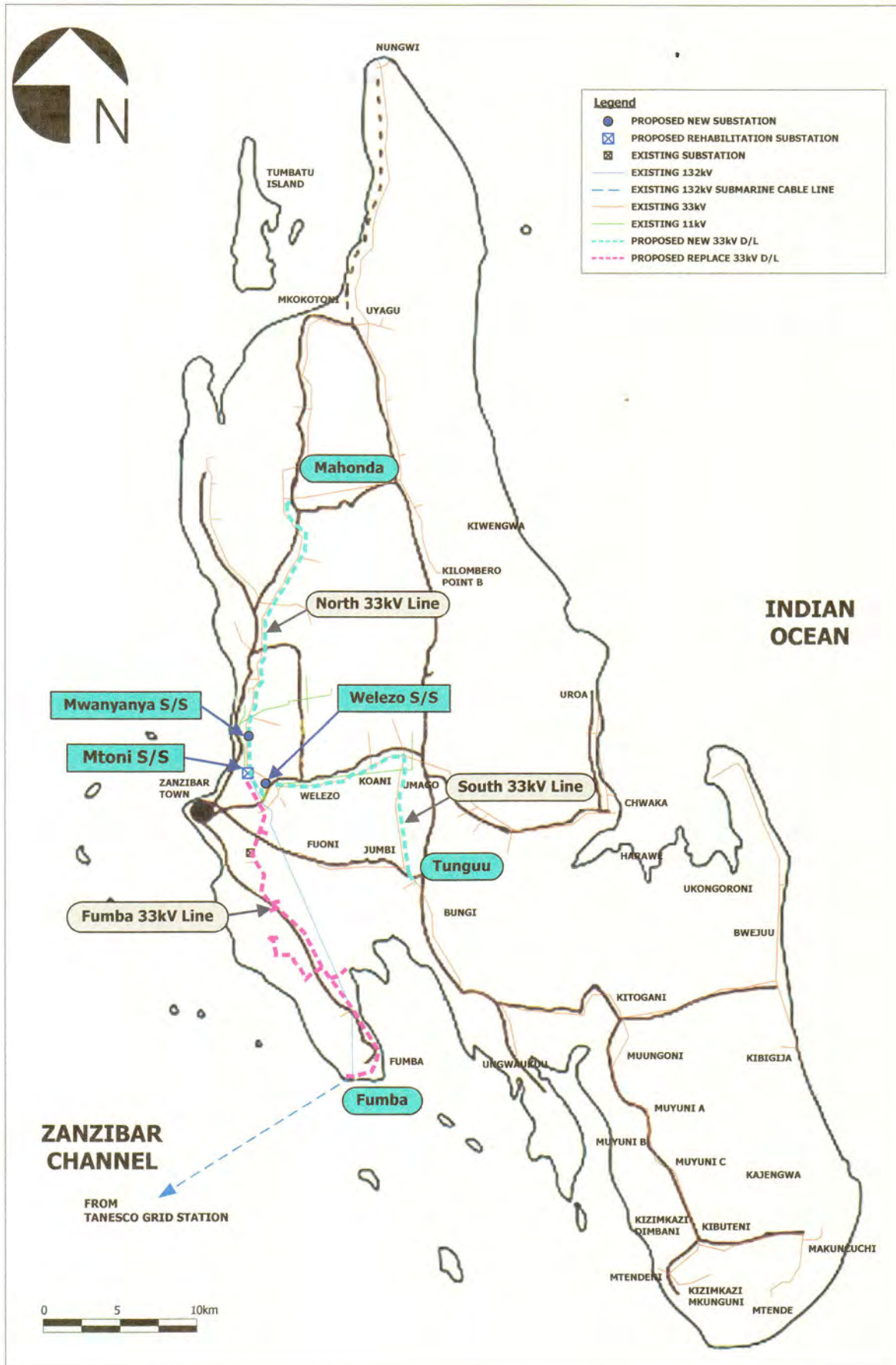
- d) Construction of access roads outside the sites.
- e) Exemption or payment of registration fee for Japanese supervisors and engineers for the construction period.
- f) Relocation of existing telephone lines in Welezo Substation.
- g) Replacement of existing 11 kV intermediate poles with 11 kV section poles for feeder connection near Mwanyanya Substation.
- h) Relocation of existing transformers for power distribution for the replacement of the Fumba line

(End)

|         |   |
|---------|---|
| Annex-1 | Project sites                                     |
| Annex-2 | Japan's Grant Aid                                 |
| Annex-3 | Major Undertakings to be taken by Each Government |
| Annex-4 | Project Cost Estimation                           |
| Annex-5 | RAP (Resettlement Action Plan) Schedule           |







Project Sites

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## JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as “the GOJ”) is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

### 1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal & Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as “the G/A”)
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

### 2. Preparatory Survey

#### (1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

#### (2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

#### (3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

### 3. Japan's Grant Aid Scheme

#### (1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as “the



E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

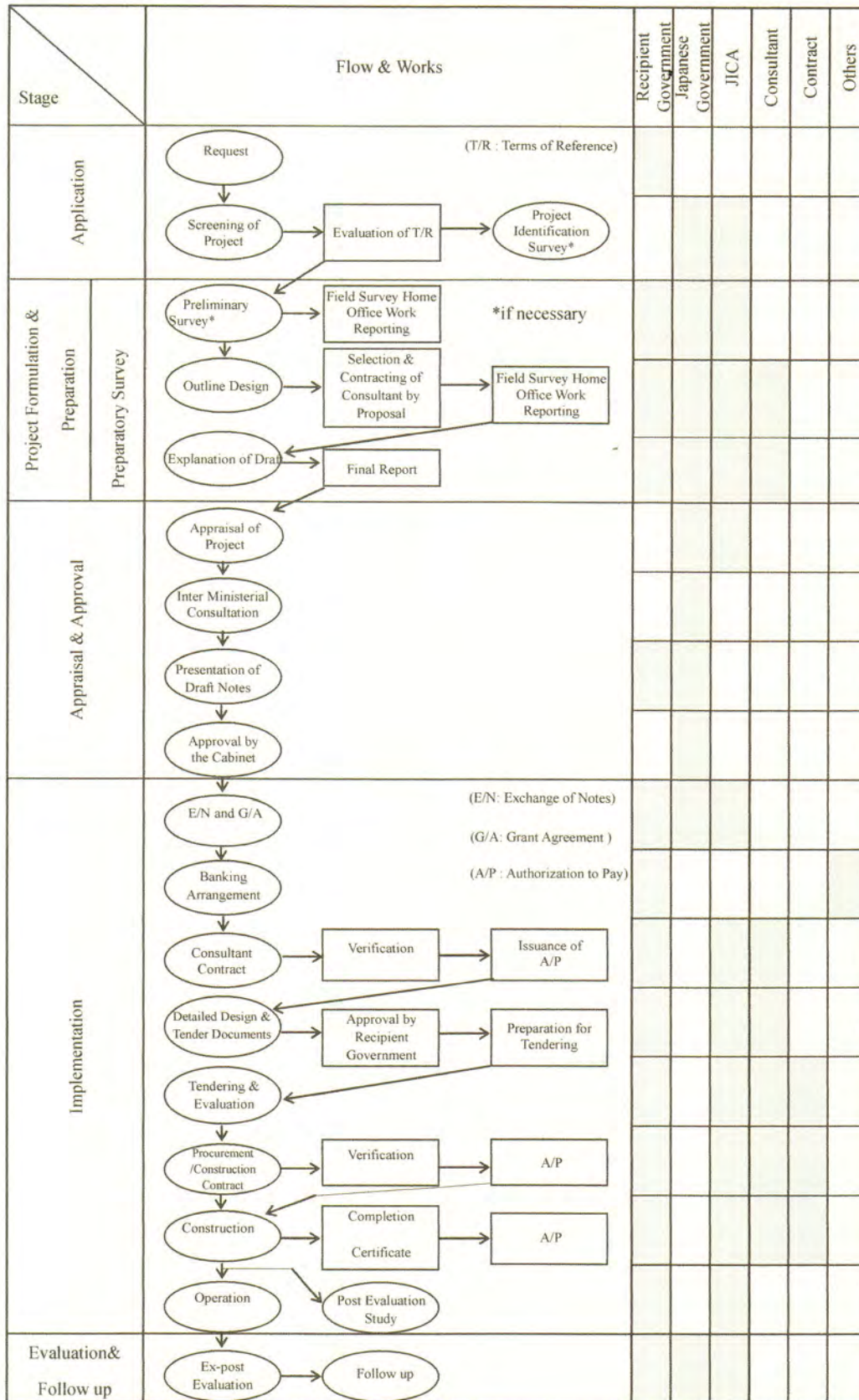
The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

(End)

### Flow Chart of Japan's Grant Aid Procedures



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M.A.

HA



## Major Undertakings to be taken by Each Government

| No. | Items  | To be covered by Grant Aid | To be covered by Recipient side |
|-----|--|----------------------------|---------------------------------|
| 1   | to secure [a lot] / [lots] of land necessary for the implementation of the Project and to clear the [site]/[sites];  |                            | ●                               |
| 2   | To construct the following facilities  |                            |                                 |
|     | 1) The building  | ●                          |                                 |
|     | 2) The gates and fences in and around the site   |                            | ●                               |
|     | 3) The parking lot   | ●                          |                                 |
|     | 4) The road within the site  | ●                          |                                 |
|     | 5) The road outside the site   |                            | ●                               |
| 3   | To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the [site]/[sites]  |                            |                                 |
|     | 1) Electricity   |                            |                                 |
|     | a. The distributing power line to the site   |                            | ●                               |
|     | b. The drop wiring and internal wiring within the site   | ●                          |                                 |
|     | c. The main circuit breaker and transformer  | ●                          |                                 |
|     | 2) Water Supply  |                            |                                 |
|     | a. The city water distribution main to the site  |                            | ●                               |
|     | b. The supply system within the site (receiving and elevated tanks)  | ●                          |                                 |
|     | 3) Drainage  |                            |                                 |
|     | a. The city drainage main (for storm sewer and others to the site)   |                            | ●                               |
|     | b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site   | ●                          |                                 |
|     | 4) Gas Supply  |                            |                                 |
|     | a. The city gas main to the site   |                            | ●                               |
|     | b. The gas supply system within the site   | ●                          |                                 |
|     | 5) Telephone System  |                            |                                 |
|     | a. The telephone trunk line to the main distribution frame/panel (MDF) of the building   |                            | ●                               |
|     | b. The MDF and the extension after the frame/panel   | ●                          |                                 |
|     | 6) Furniture and Equipment   |                            |                                 |
|     | a. General furniture   |                            | ●                               |
|     | b. Project equipment   | ●                          |                                 |
| 4   | To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products   |                            |                                 |
|     | 1) Marine (Air) transportation of the Products from Japan to the recipient country   | ●                          |                                 |
|     | 2) Tax exemption and custom clearance of the Products at the port of disembarkation  |                            | ●                               |
|     | 3) Internal transportation from the port of disembarkation to the project site   | ●                          |                                 |
| 5   | To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services [ be exempted] / [be borne by the Authority without using the Grant]       |                            | ●                               |
| 6   | To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work |                            | ●                               |
| 7   | To ensure that [the Facilities and the products]/[the Facilities]/ [the products] be maintained and used properly and effectively for the implementation of the Project  |                            | ●                               |
| 8   | To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project   |                            | ●                               |
| 9   | To bear the following commissions paid to the Japanese bank for banking services based upon the B/A  |                            |                                 |
|     | 1) Advising commission of A/P  |                            | ●                               |
|     | 2) Payment commission  |                            | ●                               |
| 10  | To give due environmental and social considerations in the implementation of the Project.  |                            | ●                               |

\*1 B/A : Banking Arrangement, A/P : Authorization to pay)

**This Page is closed due to the confidentiality**



