

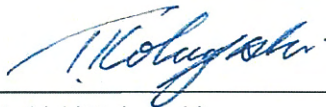
Technical Notes

On the Preparatory Survey on The Project for Clean Energy Promotion Using Solar Photovoltaic System in Belize

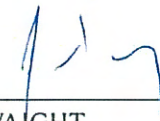
The Minutes of Discussion for the captioned Project was signed between Mr. Motoyuki UEGAKI, leader of Preparatory Survey Team of JICA, Mr. Joseph WAIGHT, Financial Secretary of Ministry of Finance, Ms. Yvonne HYDE, Chief Executive Officer of Ministry of Economic Development, Commerce, Industry & Consumer Protection, and Mr. Cadet HENDERSON, Chief Executive Officer of Ministry of Works on August 14, 2009.

The Team carried out a detailed survey at the sites and held discussion with the engaged personnels of Ministry of Finance; and Ministry of Works. In the course of the discussion, among the parties have confirmed the additional items described in the attached sheets for supplementary documents of the Minutes of Discussion.

Belmopan, July 1, 2010



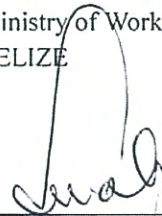
Toshiaki Kobayashi
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Financial Secretary
Ministry of Finance
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Cadet HENDERSON
Chief Executive Officer
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Santos Mahung, Ph.D.
President
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ATTACHMENT

1. Implementation Schedule

In response to the request for implementation schedule from the Belizean side, the Team has explained tentative expected implementation schedule of the Project as shown in ANNEX-1. According to the schedule, the installation of the PV System is estimated to be completed by the end of March 2012, and the completion of training with the PV System is estimated to take few more months from the completion of the installation.

2. Scope of Work

The Team has explained the electrical system composition, methodology and principle of the grid-interconnection and shown a single line diagram of the PV System(ANNEX-2).

Both of the parties have understood that the PV System will be connected to the national grid of 11kV which is owned by the power utility company(BEL) and being supplied to other consumers as well as the University of Belize (hereinafter referred to as "UB") in Belmopan. Based on the plan, both of the parties have confirmed the Scope of Work. And the Team also assures that proper spare parts of PV System under this grant aid will be provided from Japanese side of the Project.

3. Necessary Area of Project Site

The Team has confirmed that the PV System will be installed at the UB Central Campus site in Belmopan. Based on the approval of the board in UB, the Team has shown necessary working area within the Site and indicated the necessary dimension for the PV System. Additionally, the Team has explained the necessary pre-preparation works such as site clearing, leveling, arranging access roads and warehouse for spare parts to be carried out by the Belizean side prior to the installation works. (ANNEX-3 and 4).

4. Design of PV System

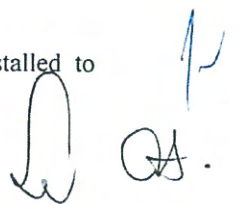
The Team has explained about the design of PV System regarding the following items:

4.1 Technical Specification of PV System

The Team has explained the technical specifications and necessary Grid –interconnection matters (ANNEX-5) which have been organized based on confirmation about technical requirements with the parties concerned, which are described in the Minutes of Meeting with BEL (ANNEX-6).

4.2 Monitoring Display Panel in the Site

The Team has explained about a Monitoring display Panel that is to be installed to



demonstrate available data from PV System. Based on the discussion with UB, both of the parties mutually confirmed that one set of the Monitoring Display Panel will be installed on the front entrance of the Jaguar Auditorium building so that the panel can be observed by all students and staff of UB. The Monitoring Display Panel is planned to show the momentarily power (kW) consumption, solar power generation (kWh/day), irradiation and temperature etc. The detailed specification will be discussed after manufacturers are determined.

5. Organization Setup for Operation and Maintenance

The Team has confirmed that necessary organization (personnel) for the operation and maintenance for the PV System will be organized by the Belizean side prior to the commencement of the installation so that the training will be carried out effectively. Due to the limited human resources, the Team proposed "Plan of Operation and Maintenance" (ANNEX-7). In addition, environmental awareness consideration is also expected to be developed through the training under the Project. The Belizean side has understood that the necessary training will be provided by the Japanese side in the Project.

ANNEX-1

Expected implementation schedule

ANNEX-2

Single Line Diagram

ANNEX-3

Layout for PV system in UB

ANNEX-4

PV System Arrangement

ANNEX-5

Technical Specification of PV System

ANNEX-6

Minutes of Meeting with BEL

ANNEX-7

Plan of operation & maintenance

(Confirmation of technical matters Grid-interconnection of PV System)

(ANNEX-1)

Project Implementation Schedule(tentative)

Clean Energy Promotion Using Solar Photovoltaic System in Belize

Work Items	2009			2010												2011												2012			
	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
Preparatory Survey																															
E/N																															
G/A																															
Selection of Consultant for Project Supervision																															
Tendering Stages																															
Finalization of Tender Document																															
Tender Openings																															
Evaluation of Tender																															
Contract with a Tenderer																															
Certification of Japanese Government																															
Procurement of PV System																															
Design and Drawing of PV system																															
Manufacturing																															
Ocean and Inland Transportation																															
Construction and Commissioning of PV System																															

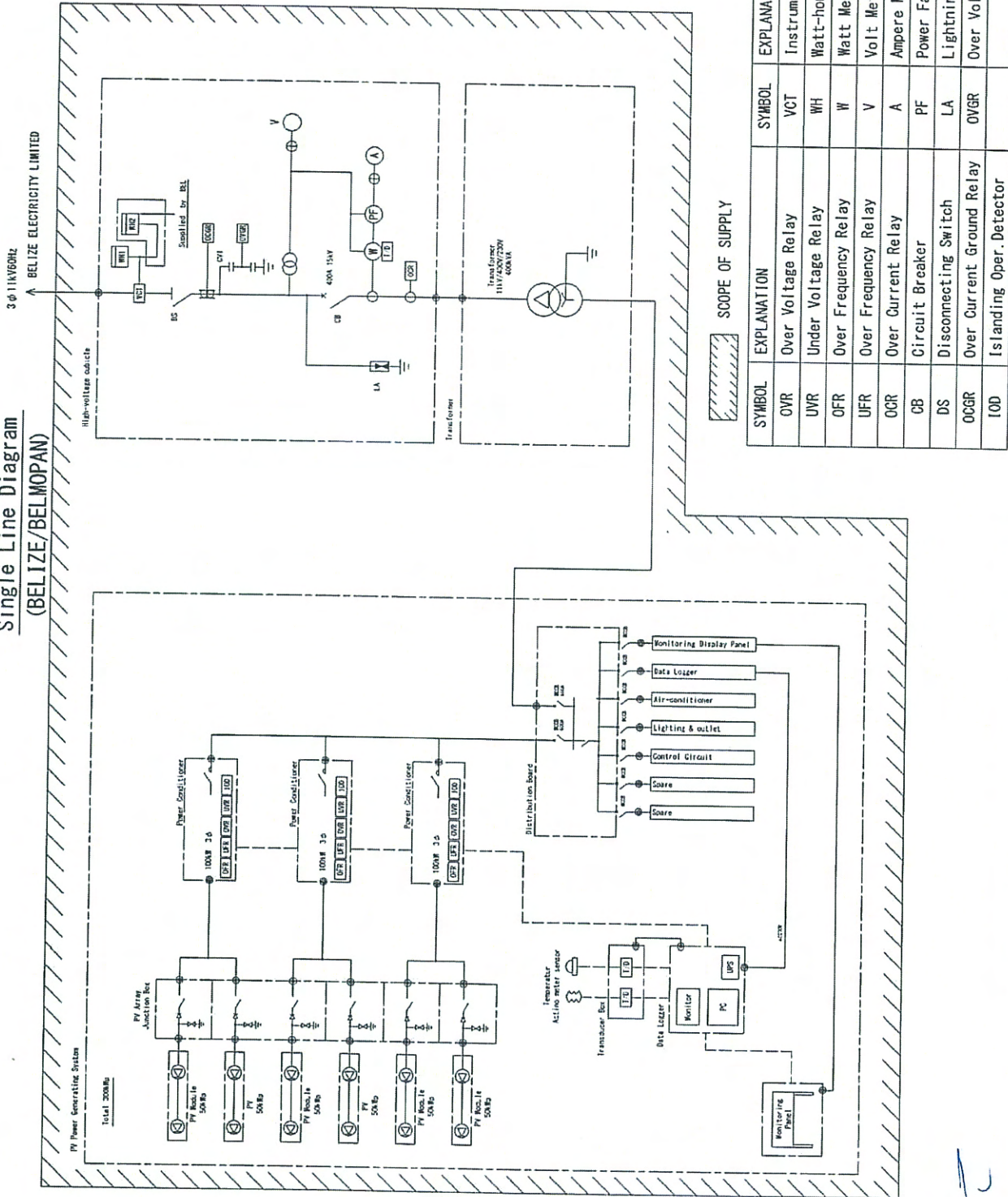
Note 1: This tentative schedule is drafted by the Consultant according to the ordinary Japanese Grant Aid Scheme without any official consent from JICA and other authorities concerned on this schedule.

Therefore, there is some possibilities of schedule alteration after reviewing.

[Handwritten signatures and initials]

(ANNEX-2)

Single Line Diagram
(BELIZE/BELMOPAN)



SCOPE OF SUPPLY

SYMBOL	EXPLANATION	SYMBOL	EXPLANATION
OVR	Over Voltage Relay	VCT	Instrument Transformer
UVR	Under Voltage Relay	WH	Watt-hour Meter
OFR	Over Frequency Relay	W	Watt Meter
UFR	Under Frequency Relay	V	Volt Meter
OCR	Over Current Relay	A	Ampere Meter
CB	Circuit Breaker	PF	Power Factor Meter
DS	Disconnecting Switch	LA	Lightning Arrestor
OCGR	Over Current Ground Relay	OVGR	Over Voltage ground Relay
IOD	Islanding Oper. Detector		

For Explanation Purpose Only

THE PROJECT
FOR
CLEAN ENERGY PROMOTION
USING SOLAR PHOTOVOLTAIC SYSTEM
IN THE BELIZE

DRAWING TITLE
BELMOPAN, BELIZE
SINGLE LINE DIAGRAM

DRAW. NO. PREPARED BY KUMASU
CHECKED BY EGAWA
APPROVED BY KOBAYASHI
DATE Feb-26, 2010

