Grid-Connected Backup System for Fantsuam Foundation

Load and design requirements

25th March 2007

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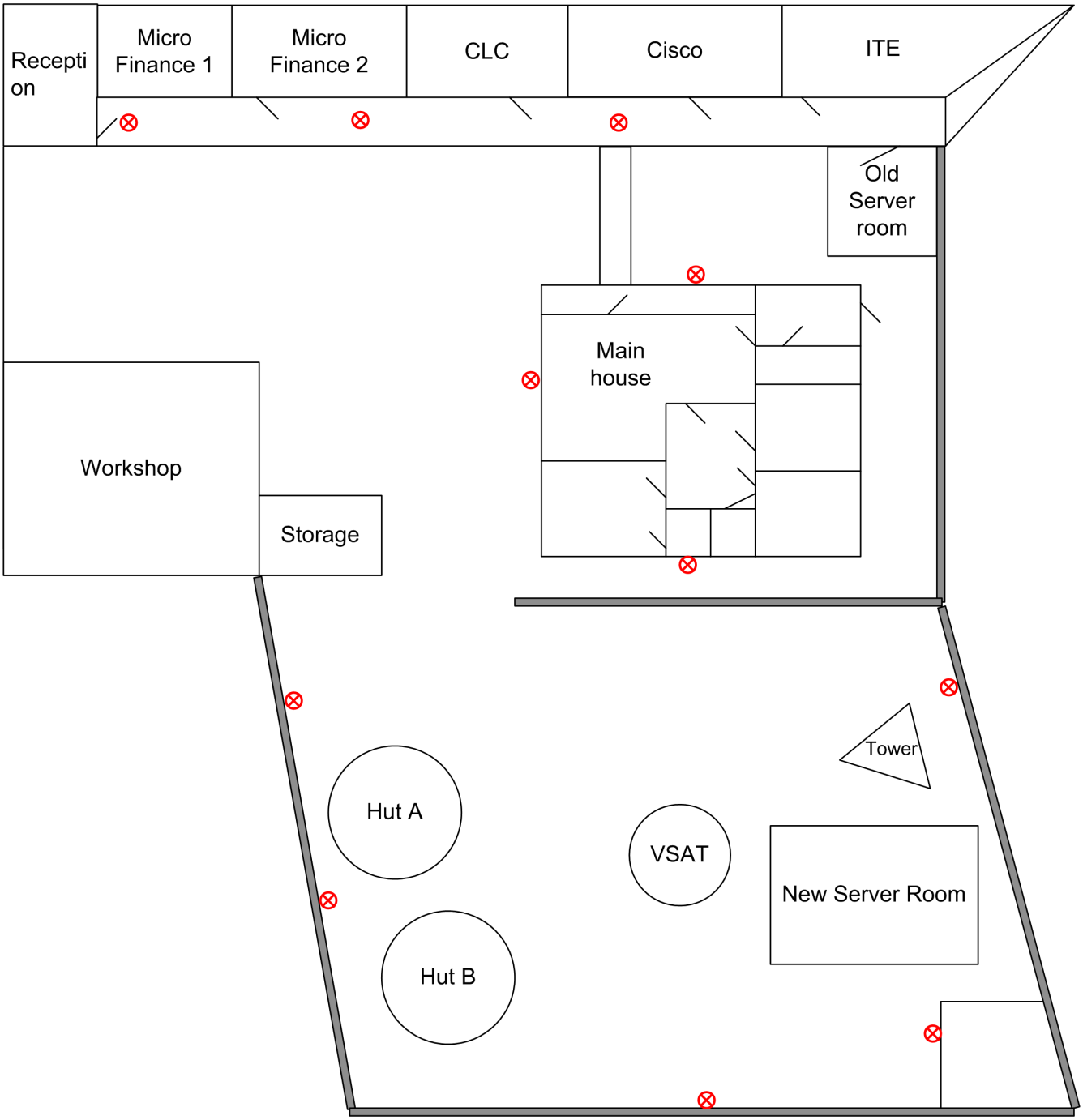
1 Physical Description

From the physical and functional point of view, Fantsuam Foundation is divided in the following spaces

1. Reception
2. Microfinance (MF1)
3. Microfinance (MF2)
4. Computer Learning Center (CLC)
5. Cisco Laboratory (Cisco)
6. IT Essentials (ITE)
7. Network Operation Center (Current)
8. Main House
9. Hut 1
10. Hut 2
11. Outdoor Lights


Recepti
on
Micro
Finance 1
Micro
Finance 2
CLC
Cisco
ITE
Old
Server
room
Main
house
Workshop
Storage
Tower
Hut A
VSAT
New Server Room
Hut B

2 Description of the loads

The loads should be divided in four independent subsystems:

1. Network Operation Center (NOC)
2. ICT Equipment (Offices. Main House and Training Rooms)
3. Lamps (Indoor & Outdoor)
4. Stand-Alone Street Lights
5. Grid-Direct Connected

2.1 NOC Subsystem

This subsystem should contain all the operational elements of the Network Operational Center including servers, VSAT equipment, wireless access points and workstations.

The system should have an autonomy of 3 days

L1	NOC	Hours	Units	Power	Wh	
	sB access points	24	5	15	1800	
	Low Power Servers	24	4	30	2880	
	LCD	2	4	50	400	
	Laptops	10	3	75	2250	
	Lamps	8	4	15	480	
	Satellite VSAT	24	1	60	1440	
					9250	10000

A PV solar caption subsystem should be included with a maximum nominal power of 2 KWp to extend the availability of the NOC subsystem.

2.2 ICT Subsystem

This subsystem includes all the IT equipment used in the training and administration. The subsystem should be able to power PCs, routers, Cisco laboratory equipment, printers, scanners etc.

L2	ICT Equipment	Hours	Units	W	Wh	
	PC + Screens	8	30	150	36000	
	Printers	1.5	5	100	750	
	Hubs + Switches	8	3	100	2400	
	Cisco Equipment	8	3	200	4800	
					43950	45000

L2(2)	ICT Equipment	Hours	Units	W	Wh	TOTAL
	PC + Screens	8	30	75	18000	
	Printers	1.5	5	100	750	
	Hubs + Switches	8	1	100	800	
	Cisco Equipment	8	3	200	4800	
					24350	25000

The daily energy requirement of this subsystem is 45 KWh.

A potential scenario is to replace several of the workstations for low power units. In this scenario the energy requirement of this subsystem is 25 Kwh/day.

This subsystem should have an autonomy of 2 days.

2.3 Lamps Energy Subsystem

This subsystem should include all the lamps of Fantsuam Foundation including both indoor and outdoor lamps. A total of 70 lamps should be also part of the installation.

L3	Lamps	Hours	Units	W	Wh	TOTAL
	Indoor	8	50	21	8400	
	Outdoor	3.5	20	23	1610	
					10010	10000

The daily energy requirement of this subsystem is 10 Kwh. This subsystem should have an autonomy of 2 days.

2.4 Street Lights

A special case is the street lights as they will operate as stand alone systems. A total of six street lights are planned.

L4	Street Lights	Hours	Units	W	Wh	TOTAL
	Outdoor Street Lights	6	1	21	126	

2.5 GRID Subsystem

This subsystem should contain the air conditions, fans, heaters, refrigerators and any other load not included in the other subsystems.

2.6 Summary Loads (Subsystems)

Summary	Load Subsystem	Wh/day	Aut	Comments
L1	NOC	10000	3	2 Kwp (PV)
L2	ICT Equipment	45000/25000	2	
L3	Lamps	10000	2	70 Lamps
L4	Stand Alone Street Lights		2	6 Street-Lamps

3 System Requirement

Fantsuam seeks initial expressions of interest and design proposals for an electricity backup system for the four load subsystems described in Section [2]. The expressions of interest should address the following requirements:

- The main source of alternate power for all subsystems should be groups of deep cycle batteries.
- All the subsystems with exception of L4 should be connected to the grid and received stabilized power when available.
- The L1 subsystem (NOC) should include a solar-PV caption system as an extra source of energy. The maximum size of this system should be 2 KWp.
- In order to evaluate the cost savings of using low power equipment in *load subsystem L2*, the quotes should include a comparative price for a daily load of 45 KWh vs 25 Kwh.
- The design should allow the charge of the batteries from the existing generator.
- The design proposal should include an overall design of the installation and the type/model/origin of equipment to be implemented.
- The design proposal should include the costs for all internal wiring and electrical installation necessary, including grounding, sockets, distribution and dividing boxes, etc.
- The design proposal should assume that the batteries, solar panels, inverters should be placed in the new network operation center.
- Comparative prices between equipment options should be included including benefits and

drawbacks of the different options.

- Warranties of both hardware and installation should be included.
- First expression of interest and initial quotes are expected before the 10th April 2007