

Comboni Hospital Sakopage

Inspection of the electrical Installation:

Date of Inspection: 11/04/2016

Inspection team: Kwaku Bassinge, senior technician, HTU
Ueli Iseli, Generalist, GSHT
Eggenberger Rudy, Inspector, team leader, GSHT

Comboni hospital : Ahiabu Wonder Frenzy, Electrician, Comboni Hospital
Mr Paul Gagbe, Administrator, Comboni Hospital

Measuring equipment: Chauvin Arnoux, installation tester CA 6115
Chauvin Arnoux, ampere Meter Clamp CA F09

Scope of inspection: Visual and specified Inspection of all electrical component.
Human- and Object security

Remarks: All system needs a general overhaul.
Most of the installation parts are not save and dangerous.
An electrical Grounding for the Theatre generator is not installed and must be done to save the system.

Inspection Report:

01 ECG Æ Feedline, Overhead Transformer:

01.01 The Voltage at the actual step of the Transformer is too high.....! High voltage will affect electrical and electronic systems all over the Hospital.

Time 09.45 AM

200 kVA, Δ 33 kV

L 1	ó	N	= 252 V	116 Amps.
L 2	ó	N	= 250 V	92 Amps
L 3	ó	N	= 250 V	123 Amps

Grounding Resistance: 3.3 Ω

The Voltage is too high. The ECG- Transformer must be stepped down to a tension of max. 235 V.

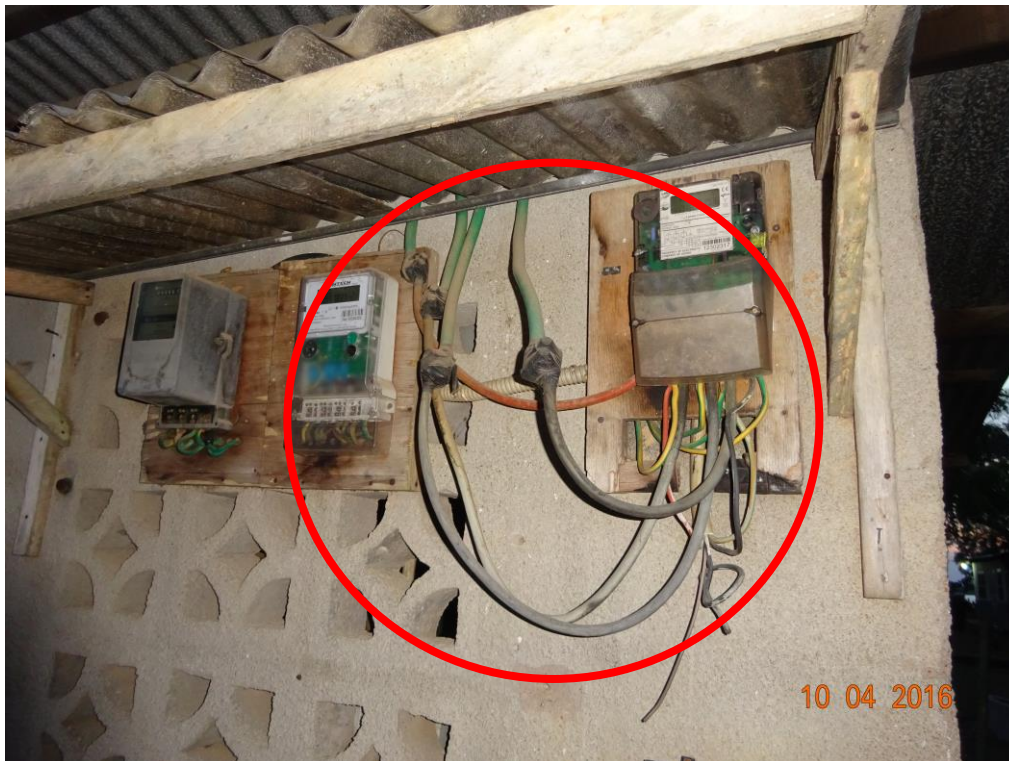
The Grounding Resistance must be below 1 Ω.



○ Twisted wire, needs good cable connectors

02 ECG- feeding Powerhouse:

02.01 The ECG- Grid main feeding line must be connected to an Incoming Fuse or switch before the connection to the ECG- meter.



02.02 Instead of single lead wires a cable with 4 x 150 mm² would be requested.

02.03 In case of a fault, the incoming line must be able to switch off.

02.04 Why there is no indirect metering with Currant converters 200/5 A.

02.05 The generator supply to the Theatre and the Dental clinic is in a very bad condition and needs a general replacement. (new cable)

02.06 Oil leakages, voltage fluctuations,

02.07 Exhaust must be guided outside the roof



02.08 The N- Lead must be hooked to the grounding system. (not available, must be build)

02.09 The connecting wires should be replaced with cable 5 x 10 mm².

02.10 No reliable grounding system for the generator star point is available-
A grounding system must be built with a grounding resistance less than 1 Ω.

02.11 Without a star point grounding, the human- and object safety is not guaranteed.

02.12 To provide a reliable emergency power supply, a new powerhouse like the one in the Catholic Hospital Battor must be build.

02.13 2 equal 200 kVA- Generator provide a redundant system. The planned 175 kVA- Generator can't provide a development for the next ad least 10 Years.

03 Dental Clinic



- 03.01 All fuse boards need general overhauls. All wire connecting points must be divided to separate wire connector. (see sample GHST)
- 03.02 Some of the fuse groups are over fused and provide no safety. (Danger of fire) (1.5 mm² max. fuse 10 Amps, 2,5 mm² max. 16 Amps., 4 mm² max. 20 Amps., 6 mm² max. 25 Amps.....)
- 03.03 The main supply cable from the power house to the dental clinic must be replaced. (5 x 16 mm²)
- 03.04 All wall sockets must be connected with a separate lead (yellow- green) to the ground.
- 03.05 All metallic table and others must be connected to the ground. (min. size cable 2.5 mm² yellow- green)

04 Theatre

- 04.01 The whole electrical installation at the theatre is in a very bad condition and unsafe.
- 04.02 The main supply line from Powerhouse must be replaced. Size 5 x 16 mm² .
- 04.03 The junction box for the incoming cable is located on a dangerous place. The box must be fixed 1.5 m above the floor
Open connections, twisted cable connections, no way to identify the leads, not covered...



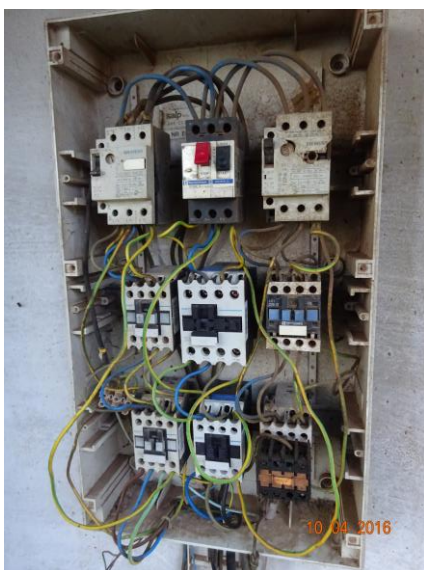
04.04 All fuse boxes must be done as sample GSHT to prevent electrical shocks and fire.

04.05 Theatre, ordination rooms, operating beds and tables are listed in the highest electrical security standard and must be hooked to a separate Potential equalisation system and RCD- protection. For that contact HTU to get instruction.

04.06 An adequate UPS- System must be installed to bridge the blackout time in case of a blackout. All life support systems, lights, air conditioner must be able to run them for at least 1 hour as an autonomy System. (15 – 20 kVA)

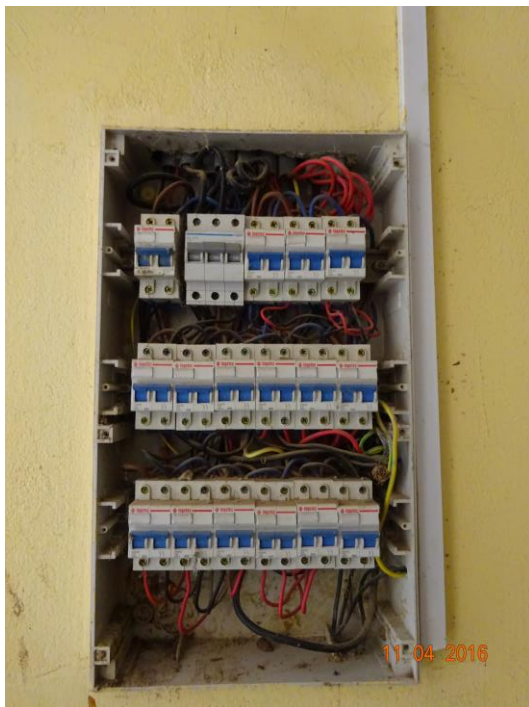
04.06 The central air conditioner needs a general overhaul. New Air filter, faulty electrical control board, cleaning air channels....

05 Hospital Main water supply



- 05.01 The Electrical connection is faulty. A new cable from the power house to the water pumping station must be installed, size 5 x 10 mm² .
- 05.02 The pump control board is in a horrible condition. Wrong coloured and flying wires, twisted wire connection, no adequate fuse, no RCD...!!
- 05.03 The pump control board is open and is affected from dust and humidity, the installation must be placed in a dust- and waterproof housing.
- 05.04 An useful Water filtering system should be installed to prevent clogging the pipes.

06 Administration Block



- 06.01 The ECG incoming line is connected direct to the fuse board. A main control switch must be installed. To prevent and protect all electronic devices from overvoltage and lightning a solid grounded surge must be installed.
- 06.02 Most of the electrical circuits are over fused. Replace the wrong fuses according the outgoing size of the wires. (see 03.02) .
- 06.03 To hook the administration block to the emergency power supply, a cable from Powerhouse should be laid. Size 5 x 16 mm² .
- 06.04 All wall sockets must be checked. Most of them are not connected to the Ground.

07 Maternity



07.01 The fuse board must be done like the GSHT – sample. Some of the outgoing lines are over fused. See 03.02

07.02 The fuse board cover must be fixed proper to prevent dust and insects to enter.

07.03 To hook the Maternity block to the emergency power supply, a separate cable connection to the power house should be done. Size 5 x 10 mm² .

08 Guest and Volunteers Quarter

08.01 Power house

08.01.01 The star point grounding of the generator is not proper connected.

08.01.02 The electrical installation needs a general overhaul.

08.01.03 To reduce cost and maintenance in case of a new powerhouse at the Hospital connect a cable from the Hospital Powerhouse to the Quarter, Size 5 x 16 mm².

08.01.04 To prevent different Grounding potentials the Radio Tower grounding must be connected to the internal grounding system.

08.02 Kitchen, Canteen

- 08.02.01 All wall sockets, ceiling fans, FL- Lights and Air- conditioner must be connected to the Ground.
- 08.02.02 For safety reason all electrical equipment should be RCD protected.

08.03 Flats

- 08.03.01 All wall sockets, ceiling fans, air conditioner, FL- lights must be connected to the ground.
- 08.03.02 For safety reason all electrical items should be connected on RCD circuits.

10./11. April 2016

Ghana Switzerland Hospital Technicians

Grad. Electrical Inspector

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