LAKE TANGANYIKA
FLOATING HEALTH CLINIC

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Kirando Health Center Facilities Upgrade Report
Nkasi District, Tanzania – July/August 2014

I. Context and Justification of Project

Kirando is a large health center in Nkasi District, Tanzania, located along Lake Tanganyika, serving 250,000 residents. Despite having recent renovations to their operating theater, Kirando was still unable to perform surgical procedures consistently as it had no reliable electricity, no oxygen concentrators, and no fully equipped, manually adjustable operating tables.

The LTFHC prioritized this location because the population it serves suffers from a high maternal mortality rate and it is one of the few health centers in the area that provides comprehensive emergency obstetrical care. In addition, our organization has completed previous projects at Kirando and thus has a good working relationship with its health care workers. The LTFHC frequently communicated with local staff leading up to and during the project to ensure upgrades and interventions effectively met their needs.

This facilities upgrade was funded by a generous $50,000 grant from an anonymous donor.

II. Technical Installations, Donated Equipment and Upgrades

A. The existing Kirando Health Center 20kVA generator had been wired using inadequate 6mm wire, which had been completely disconnected from the operating rooms. The LTFHC supplied 75 meters of 16mm armored four-core cable which was laid underground to a 65Amp three-phase change over switch, which now allows switching between solar and generator power for the entire Health Center complex.

B. A basic pre-existing solar power system for the main hospital building (previously financed by the LTFHC and installed by the Moravian Mission) provided solar powered lighting throughout the complex, but was insufficient to run any additional equipment. The LTFHC upgraded this system to include 700 Watts of solar panels, an 800 Amp-hour battery bank (shown below), and a 1.5Kw solar hybrid inverter, which is capable of powering additional lighting for the labor and delivery ward, as well as the operation of a neonatal resuscitation table and an oxygen concentrator.

C. Our team upgraded the basic solar lighting system (which was insufficient to power any equipment) in the operating rooms to 520 Watts of solar panels, an 800 Amp hour battery bank and a 1.5Kw solar hybrid inverter, which is now capable of powering the essential operating equipment without consistent need for the generator.

D. The generator was connected with new 8mm cable and a 65 Amp change-over switch, so that the operating rooms are now able to run on either generator or solar power. This enables use of the pre-existing autoclave and neonatal resuscitation table (shown below), which had previously been non-functional due to inadequate power and wiring.

E. A new, twelve reflector, overhead operating light system was installed with additional steel structural support in operating room #1 (shown below) and a smaller, mobile four reflector operating light with 3hr battery backup was installed in OR #2.

F. Two new oxygen concentrators (one shown below), each with dual outlets and humidifiers (ie can supply two patients simultaneously) were installed in the operating room and labor wards respectively. These were provided with a supply of disposable masks and nasal cannulas.

G. A new full function, manual hydraulic, operating table was supplied and installed in OR #1 along with a full set of accessories including stirrups and arm rests.

H. Ten new hospital beds with manually adjustable tilt and drip hanger were provided, including ten mattresses and fifty sets of sheets. Also supplied were two stainless steel, three-tier medication push carts.

III. Health Care Worker Training

In 2013, the LTFHC piloted a high frequency radio communications network, including a basic electronic medical record (EMR) transmitted over that network, in rural Tanzania. During the facilities upgrade, our team completed further health care worker training on use of the EMR, including improvement of data entry efficiency, and four health care workers received extensive one-on-one instruction during individual patient clinic visits.

IV. Official Handover of the Medical Equipment

The District Medical Officer, in cooperation with the Kirando Medical Officer in Charge, arranged an intimate event on August 1, 2014 to recognize the LTFHC's work in the community and to formally accept our donated equipment. Various leaders were in attendance, including Kirando Health Center employees, local reporters, and village council members. Speeches were given by representatives from the District Medical Office compelling the community to take good care of the new resources we provided. A short tour was given to show the upgrades to all attendees, which was followed by a social luncheon.

V. Project Results

A. Summary of Donations to Kirando

- 10 hospital beds with mattresses
- 50 sets of hospital bed sheets
- 1 manually adjustable operating table
- 2 oxygen concentrators with oxygen masks and tubing
- 1 portable operative light
- 1 ceiling mounted operative light with custom-made steel structural support
- 2 medication push-carts
- 6 solar panels
- 4 200Amp solar batteries
- 75 meters of 16mm armored electrical cable
- 200m of 2.5mm electrical cable
- 1 3-phase change-over electrical switch
- 5 13Amp electrical outlets
- 2 15Amp electrical outlets
- 16 energy saving light bulbs

B. Summary of Outcomes

- The LTFHC established electrical connectivity between the existing health center generator and the operating rooms
- The solar power system in the operating rooms has been upgraded with additional power capacity and the ability to switch easily between generated and solar power
- The solar power in the main hospital building was upgraded and can now power electrical equipment such as oxygen concentrators in the labor and delivery ward
- The LTFHC wired and tested the pre-existing neonatal resuscitation table and autoclave that had never been used before and both are now functional.
- Four health care workers received extensive technical training on EMR use
- A maintenance plan was outlined and approved by the District Medical Office and health center employees

VI. Project Challenges

The rainy season extended late this year, so the ground was still too wet to engage in well digging during the facilities upgrade.

VII. Next phase

Our team will return to Kirando to put in the well and upgrade the plumbing once the ground has dried out, likely Fall 2014.

Special thanks to Chris Horsfall for donating his time and expertise as well as the District Medical Office for their overall support.