

**Bio-medical engineering / equipment maintenance volunteer
required for scoping work in Zambia**

1.0 Introduction

THET is a UK-based health charity committed to improving health services in developing countries. With over twenty years of experience working with health institutions around the world - promoting action that is practical, sustainable and responsive, our approach enables the UK's expertise in health service delivery and training to be channelled towards the needs of those we work with overseas. THET promotes partnerships called 'Links' between NHS institutions, health training schools, professional associations and their counterparts in developing countries. We work in partnership with Links to pilot initiatives and scale up work to address wider needs. THET has been appointed the management agent for a project aimed at strengthening the capacity of Zambia health training institutions to train health workers. The project is funded by the Department for International Development [DFID] and has also received significant support from the Department of Health who provided support for the initial scoping of the proposal.

For more about the organisation visit: www.thet.org.uk.

2.0 Project background

This project aims at contributing towards the accelerated achievement of health Millennium Development Goals and improvement in healthcare service delivery through strengthening the capacity of the government's health worker training in Zambia in four key areas:

Medical training

The School of Medicine - University of Zambia [UNZA] has been successful in establishing MMed programmes in a number of postgraduate medical specialties including Surgery, Orthopaedics, Urology, Obstetrics and Gynaecology, Paediatrics and General Medicine. And with this strategy the retention of fully trained doctors in Zambia has improved significantly. In addition, increasing opportunities for private practice are developing in Lusaka permitting senior doctors to augment their income making it financially practical to live and work in Lusaka. However the Medical School has particular difficulties in accessing lecturers in Pathology, Psychiatry and Anaesthetics and thus there are no in-country training programmes in these three specialities.

Nursing and midwifery

Nurse training on the other hand is undertaken in a number of dispersed nursing schools throughout the country [run by either the government or NGOs]. With a revised curriculum for nurse training on the way the standards are set to improve. However there are huge challenges in retaining trained nurses and nurse tutors in the rural areas which are still perceived as unattractive despite a rural allowance being paid. This affects the quality of delivery of the nursing curricula particularly in rural training institutions.

Health “Links”

Health Links are long-term partnerships between UK health institutions and their counterparts in developing countries. The aim of Links is to improve health services in developing countries through the reciprocal exchange of skills, knowledge and experience between partners in the UK and those overseas. Links can operate between a diverse range of formal health institutions [including colleges/universities, teaching hospitals or training centres, hospitals, NHS corporate bodies, non-governmental organisation run clinics, non-profit health practices, professional institutions and health ministries] and cover numerous disciplines. Whilst there are various links in Zambia at the moment there is need for a concerted effort to; strengthen coordination/collaboration amongst health Links and foster the growth of new Health links in Zambia.

Bio-medical engineering

Zambia like any other country in the region faces numerous challenges in the maintenance, technical management and repair of medical equipment. A review conducted in 2006 on the state of medical equipment and maintenance around the country highlighted significant issues, key amongst them being the development of criteria to determine staff, training and organisational needs for equipment management and maintenance. This gap impacts negatively on any interventions envisioned to address the medical equipment maintenance challenges identified.

The current status of trained equipment maintenance personnel in Zambia leaves a lot to be desired where only the large hospitals [up to provincial level] have some maintenance staff. Most of other district hospitals in the country have either inadequately trained personnel or no staff at all. The review conducted cites a projected need of a minimum of 120 equipment maintenance personnel across the country whilst the current capacity is less than 15 qualified staff. This situation is aggravated further by

the lack of suitable training in-country for medical equipment maintenance staff and thus the country is forced to rely on other engineering professionals to fill in the gap. There is a desperate need to entrench biomedical engineering in Zambia as a first step in addressing equipment maintenance challenges and stem the huge cost of medical equipment breakdown due to lack of proper maintenance and ability to repair. Through other initiatives Zambia has been able to come up with manuals and operating procedures for equipment management and maintenance. These manuals are quite extensive and cover; acquisition, installation, commissioning, maintenance of medical equipment, training of users, setup/maintenance of equipment inventories whilst providing a detailed staff establishment required in the implementation of equipment development planning. However, despite this established posts the country does not have adequately trained staff to fill in most of these posts around the country.

With this in mind the Ministry of Health [Z-MOH], Zambia UK Health Workforce Alliance [ZUHWA], THET and DFID are working together to strengthen Zambia's capacity to train/retain health workers, build capacity in medical equipment maintenance/training of medical equipment technicians whilst leveraging Health Links to provide sustained support in these key areas.

To address these challenges, the proposal is to appoint an experienced volunteer to assist in design and development of a course that will produce trained hospital level medical equipment technicians for the health sector. This document seeks to outline the terms of reference of the volunteer.

3.0 Specific Terms of Reference

Specific tasks to be undertaken by the volunteer include:-

- a) Take the lead in the conceptualisation and development of a course(s) in medical equipment maintenance, technical management and repair. This will involve:
 - Conducting a comprehensive needs assessment geared towards the setup of a course to address biomedical engineering, medical equipment maintenance, technical management and repair in Zambia
 - In-depth consultations with counterparts in Zambia and the UK on available mechanisms and support to implement the developed course(s)
- b) Harness support in Zambia and the UK for delivery of the designed training plan/course(s) taking into consideration issues like: use of e-learning and harnessing Public Private Partnerships [PPPs],

charitable organisations with engineering expertise, faith-based institutional support and professional bodies

- c) Plan for and disseminate all recommendations and lessons learnt among stakeholders in Zambia and the UK
- d) Work with THET to put together a training resource package for similar initiatives across the region [to avoid future re-invention of the wheel/duplication of effort]
- e) Produce a concise report documenting the process

4.0 Timeframe

Ideally, we are looking for a commitment of 30-40 working days to undertake this project, although this can be used flexibly in the UK (or elsewhere) and Zambia.

5.0 Support to be provided by THET

The volunteer will be responsible to Emily Measures [Zambia Programme Manager] who will be supported [in an advisory capacity] by Dr Keith Ison [Head of Medical Physics, Guy's and St Thomas NHS Foundation Trust] and Peter H. Smithson [Consultant Clinical Scientist and Head of the Medical Equipment Management Organisation [MEMO]].

Specifically, THET will provide the following:

- Background information and related documentation
- Logistics and administrative support
- Cover all costs associated with the project [e.g. travel, accommodation and meals whilst in Zambia and assignment-related travel costs in the UK]
- Review/comment on methods and other outputs of the assignment including quality assurance

6.0 How to apply

To apply please send a CV, one page covering letter highlighting any information that shows how you meet the requirements of the person specification, and a technical proposal to Rachael Schofield [rach@thet.org].

The technical proposal should show:

- An understanding and interpretation of the terms of reference

- Methodology to be used in undertaking the assignment
- Time and activity schedule

7.0 Personal specifications [essential/desirable]

	Essential	Desirable	Method of Assessment
Qualifications	Degree in an electronic/electrical/ mechanical engineering or physical science discipline or equivalent. Incorporated or Chartered Engineer [IEng or CEng] status. Membership of a professional body [e.g. IPEM, IET].	UK registered Clinical Scientist or Clinical Technologist. Management qualification [e.g. DMS]. Teaching qualification.	Certificates
Experience	Significant experience at post registration level in a clinical engineering environment. Substantial management experience leading multi-disciplinary teams. Working with clinical and policy making staff. Working as part of a multi-disciplinary team. Experience in the professional development of Clinical Engineering. Participation in relevant local and national committees. Producing scientific and technical reports.	Working within formal Quality Management Systems. Experience of managing information systems.	Interview and References
Skills	High level of numeracy and computer/IT literacy, including word processing, presentation, database, spreadsheet and scientific applications. Use of Microsoft Office to an advanced level. Good communication and presentation skills. Critical analysis of complex information where patient or public risk might be involved. Ability to prioritise workload especially in rapidly changing	Ability to handle unpredictable situations [e.g. equipment incidents].	Interview and References

	Essential	Desirable	Method of Assessment
	<p>circumstances.</p> <p>Demonstrated leadership skills.</p> <p>Ability to design teaching courses at undergraduate and post-graduate level.</p>		
Special Knowledge	<p>The impact of Statutory Regulation [e.g. the Medical Devices Regulations] and Standards [e.g. BS EN 60601] on Clinical Engineering and the delivery of its services in the UK.</p> <p>Practical experience and understanding of a wide range of medical equipment.</p> <p>Knowledge of contemporary practice in use of medical equipment [e.g. lasers].</p> <p>Knowledge of risk assessment methodologies and their appropriate application.</p> <p>Good knowledge of medical equipment management systems.</p> <p>Good knowledge of reliability engineering.</p>	<p>Contemporary healthcare issues and impacts in Zambia or a neighbouring country.</p> <p>Detailed knowledge of a broad range of clinical engineering topics.</p>	<p>Interview and References</p>
Personal Qualities	<p>Ability to work under pressure.</p> <p>Ability to work to deadlines.</p> <p>Ability to acquire knowledge quickly.</p> <p>Enthusiastic and motivated and able to motivate others.</p> <p>Ability to lead and encourage staff in achieving objectives.</p> <p>Ability to actively encourage and promote defined objectives.</p> <p>Patient and thoughtful.</p> <p>Impartial and honest in providing advice [e.g., integrity].</p> <p>Good communication skills.</p> <p>Good interpersonal skills.</p> <p>Discretion with respect to confidential and sensitive information.</p>	<p>Ability to organise, plan and record own work and the work of others in response to unforeseen and rapidly changing circumstances.</p> <p>Ability to advise and counsel staff.</p>	<p>Interview and References</p>
Others	<p>Willingness and ability to work in a tropical climate</p>		<p>Interview</p>