

KAFUE GORGE REGIONAL TRAINING CENTRE: HYDROPOWER TRAINING IN AFRICA AND BEYOND

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This is a highlight on the role of Kafue Gorge Regional Training Centre in meeting the needs in hydropower training by offering training to operations and maintenance personnel at all levels.

Background of the Kafue Gorge Regional Training Centre.

The SADC Region is rich in hydropower and potential hydropower resources, and Zambia has more than 60 years of experience with such technology. Today Zambia has more than 1608MW of installed hydropower capacity, of which Kafue Gorge Power Station alone has 900MW.

In December 1987, a joint Zambian and Norwegian team made an investigation of the training needs in Southern Africa Development Community (SADC) countries. In their report it was recommended that the training centre that ZESCO had started at Kafue Gorge Power Station, for training of the corporation's personnel in main power stations and control centres should be rehabilitated and re-opened as a Regional Training Centre.

A decision was taken to support the development during the years 1989-92 of the new training centre, called Kafue Gorge Regional Training Centre (KGRTC). The project, financed by ZESCO, NORAD and Sida, comprised rehabilitation and expansion of the existing training centre, and implementation of a number of training courses for hydropower station personnel in SADC countries. During the project period training fees and course participants' accommodation were paid by the project. The intention was to gradually make KGRTC self-sustaining economically.

A subsequent training needs assessment survey (YEAR?), financed by Sida, revealed a higher and some what different need for specialized training in the power sector than that previously report in 1987.

ZESCO, NORAD and Sida therefore approved funding for 1993-95 period allowing a programme that included 5 of the defined courses from the training needs survey. These five courses were implemented in the second phase.

Meeting the changes in power utility management

Currently, many electrical power utilities are unbundling and streamlining their services. Within these exercises staff may be required to change their jobs and/or enter into a different profession altogether. The change has not

spared most of the utilities in Africa. Zambia Electricity Supply Corporation (Zesco) Ltd, a giant power utility in Zambia provides a good example. One interesting story to recount is of a young woman who had to go through a complete career change and is working in the second largest hydropower plant in Zambia, as a plant operator after undergoing a Plant Operations course at Kafue Gorge Regional Training Centre (KGRTC) in Zambia.

There is a growing demand for electricity and the need to meet this increasing demand with reliable power resource. This means that hydropower will most certainly play an important role in the supply of energy in the future.

As there is an increasing number of units and larger capacities interconnected in a complex power system, together with the necessity to consider environmental aspects, financing and profitability, imply an increased demand of highly qualified personnel to operate plants and networks. The Kafue Gorge Regional Training centre is required to provide this training and necessary skills update in hydropower operations and maintenance.

The case of Joyce

One course participant, Joyce, worked in the hotel industry before she joined ZESCO Ltd in 1998. She was recruited by the human resources department and doing catering services from 1998 to 2001. She worked at the guesthouse as a chef and later as a ZESCO Club officer in Kariba Town. The changes in ZESCO forced her to move to operation duties in the power plant .

After a one year of in-house orientation, she was identified for training in hydropower plant operations at Kafue Gorge Regional Training Centre in 2002. She followed a 13 weeks course in hydropower plant operations and a nine months practical in-house training. At present she is works as a plant operator at the second largest power station in Zambia -Kariba North Bank with installed capacity of 600MW+.

The course in Hydropower Plant Operations provides hydropower production background to participants whose career is in operations and who work within the

hydroelectric power plant. Equipment and procedures of the Kafue Gorge Power Station are used as a reference for the training. The centre has two ABB simulators that mimic the hydropower plant operations. One is conventional and the other is computerized.

The practical approach that the centre has incorporated in the courses have received encouraging reviews from participants. The training on the simulators helped participants grasp the operations activities much faster. This is so, as mistakes are allowed on the simulator, though not encouraged, but are expensive in industry. The training on the simulators gives more flexible learning as scenarios can be changed at will by the instructor. Faults are simulated and the reactions from the operators are monitored. The participants are also attached to normal shifts at the power station. The practices at Kafue Gorge Power Station which is within the vicinity of the training centre reinforced the knowledge learnt so well, such that, when she went back to her workstation, she was a totally transformed worker. (May be you just separate the practical part from the simulation ones in stead of mixing them)

The participants who come to the training centre are given increased knowledge of techniques and modern methods of plant operations and maintenance planning. The courses further stimulate the participant's personal developments and skills and tie theoretical and practical knowledge by arranging visits to other power stations and some industries. Study tours are undertaken to hydropower plants, major substations and control centres. The tours offer course attendees to familiarize themselves with different types of power stations, operation activities and common problems in hydropower utilities.

There is increased mutual understanding of operation and maintenance problems and the centre makes it possible for the exchange of experiences between the participants with the various disciplines of hydropower operation. The participants are further given close cooperation with all major hydropower personnel in the region and a forum for sharing knowledge and experiences.

Evaluation and certification of participants

The training centre conducts evaluations of each of their course components, which enable attendees to respond openly about the course topics, materials, and instructors. Thus far, the courses have generally received favourable response from participants. This method of evaluation has also been used to improve on the course contents and duration in a number of courses. Deliberate follow up visits to utilities after training and needs analysis has also been used to identify needs and training gaps in hydropower operations in the region.

The Training centre at present is offering a number of courses. Several new courses have been introduced since inception to meet the needs of utilities in the region and other industries that find these courses of interest. A few non-engineering course have also been introduced to assist technical and non-technical personnel

KGRTC has earned an international reputation in provision of excellent training in hydropower in addition to providing good accommodation and conferences facilities and is ISO 9001:2000 certified for quality training provision.

The Centre has this year scheduled to run the following Courses for the best utilization of both water and energy resources in hydropower generation, water utilities, mining, manufacturing and other service providers.

KGRTC shall endeavor to provide training in hydropower operations and maintenance to maximize the efficient utilization of water resources both as a renewable energy resource in hydropower and more significantly as support to life through courses for the hydropower utilities and water related applications respectively.

The centre has a Sida Scholarship for women empowerment, which allows female participants on all courses at KGRTC to pay only 50% of the course fee.

Apart from running scheduled courses, KGRTC has capacity to run tailor made courses both at the center and clients' premises.

1. We train at least 160 course participants every year and are all regional based. We have trained participants from the whole SADC region and now spreading to East and West Africa.
2. We are accredited to the Technical Education Vocational and Entrepreneurship Training Authority (TEVETA) and certify our in-service skills training courses. We are going into cooperation with the local universities CBU and UNZA to go that way.
3. I have added a last statement as follows to be included on the last page "The course fees are inclusive of accommodation, meals, tuition and certification. The Centre has well furnished self-contained flats which are air conditioned and all have DSTV and an excellent restaurant."

Selected highlights and courses on offer

1. At least 160 course participants are trained every year
2. Most participants are from the SADC region and some from East and West Africa.
3. Accredited to the Technical Education Vocational and Entrepreneurship Training Authority (TEVETA) and certify all in-service skills training courses. Developing cooperation with the national universities.
4. The course fees are inclusive of accommodation, meals, tuition and certification. The Centre has well furnished self-contained flats which are air conditioned and all have DSTV and an excellent restaurant."
5. Female participants pay half the fee.

	COURSES	START DATE	FINISH DATE	COURSE FEES (US\$)	
				Male Participants	Female Participants
1	Basic Hydraulics (BH)	24-Jan	28-Jan	1,500	750
2	Fluid Flow and Centrifugal Pumps (FFCP)	7-Feb	11-Feb	1,500	750
3	Machinery Vibration Monitoring and Analysis (MVMA)	21-Feb	25-Feb	1,500	750
4	Dam Safety Monitoring (DSM)	7-Mar	18-Mar	3,000	1,500
5	Plant Operations (PO)	4-Apr	1-Jul	6,500	3,250
6	Customer Services (CS)	4-Apr	8-Apr	2,000	1,000
7	Maintenance Routines (MR)	18-Apr	15-Jul	6,500	3,250
8	Strategic Management (SM)	25-Apr	29-Apr	2,000	1,000
9	Control Room Operations (CRO)	9-May	15-Jul	6,500	3,250
10	Substation Operations and Maintenance (SOM)*	9-May	27-May	3,000	1,500
11	Environmental Assessment and Information Management (EAIM)	13-Jun	24-Jun	2,000	1,000
12	SCADA Systems Management (SSM)	20-Jun	24-Jun	1,500	750
13	Hydraulics and Turbine Regulations (HTR)	11-Jul	22-Jul	2,000	1,000
14	Shift Charge Operations (SCO)	11-Jul	16-Sep	6,500	3,250
15	Hydro Power Plant Operations and Control - Simulator (HPOC)	18-Jul	29-Jul	3,000	1,500
16	Distribution Systems Operations (DSO)	18-Jul	5-Aug	3,500	1,750
17	DC Power Systems Maintenance (DCPSM)*	25-Jul	29-Jul	2,000	1,000
18	Turbine Dynamics and Operations (TDO)	15-Aug	26-Aug	3,500	1,750
19	Industrial Safety and Fire Risk Management (ISFRM)	22-Aug	2-Sep	2,500	1,250
20	Generation Maintenance Management System (GMMS)	22-Aug	9-Sep	3,500	1,750
21	Programmable Logic Controllers (PLCs)	29-Aug	16-Sep	3,500	1,750
22	Customer Services (CS)	5-Sep	9-Sep	2,000	1,000
23	Maintenance Management Systems (MMS)	19-Sep	23-Sep	1,500	750
24	Financial Management in Utilities (FMU)*	26-Sep	30-Sep	2,000	1,000
25	Power System Operations (PSO)	26-Sep	14-Oct	3,500	1,750
26	Transformer and Switchgear Maintenance (TSM)	17-Oct	4-Nov	3,000	1,500
27	Power System Protection (PSP)	24-Oct	11-Nov	3,500	1,750
28	Substation Operations and Maintenance (SOM)*	7-Nov	25-Nov	3,000	1,500
29	Strategic Management (SM)	7-Nov	11-Nov	2,000	1,000
30	Energy Management (EM)	21-Nov	25-Nov	1,000	500