8th WEDC Conference: Water and waste-engineering in Asia: MADRAS: 1982

# AN APPROACH TO WATER SECTOR TRAINING IN DEVELOPING COUNTRIES

by A M RICHARDS

## INTRODUCTION

### Background

The importance of water to the wellbeing of mankind is universally recognised. It is now a critical factor in the public health and economic development of many countries throughout the world, particularly in the developing countries.

The United Nations Water Conference and World Health Assembly held in March and May 1977 respectively, endorsed this view and the decade 1981-90 was subsequently designated the International Water Supply and Sanitation Decade with the target of providing minimum levels of service and access to safe water supply and sanitation for all by 1990.

### Need for training

Implementation of Decade Programmes can only be achieved by considerable financial investment in engineering works, materials and manpower. A survey of 86 developing countries carried out by the World Health Organisation in 1970 reported that as a major barrier to providing water supplies in developing countries, lack of trained personnel was second only to the problems of insufficient finance. WHO concluded that efficient utilisation of funds provided for improvements to water supplies would not be successful unless qualified management and trained personnel were also available to plan, build, operate and maintain the facilities.

The expansion of the manpower infra-structure necessary to implement the Decade Programmes in Developing Countries will create a need for training new as well as existing personnel. This need will apply to all levels of staff; managerial, supervisory, technician, craftsmen and labour.

For training to be efficient and effective it must be systematic and controlled in its establishment and operation.

### Scope of paper

This paper describes a systematic approach to water sector training which has been used in Developing Countries and examines the way in which the Approach has been put into practice in the Madras Metropolitan Water Supply and Sewerage Board in Southern India.

## THE TWO PHASE APPROACH

### Objectives

The Two-Phase Approach has been developed to assist water sector undertakings in Developing Countries in providing job orientated training within their own organisation to meet current and future manpower needs.

In many countries there is provision for adequate theoretical training in Public Health Engineering at both graduate and postgraduate levels. Very few countries, particularly in the developing world, have facilities for the systematic training for non-professional, technician and operative staff in the water sector.

The objectives of the Approach are to:
- provide a sound basis for meeting present and on-going manpower development and training needs of a water sector undertaking
- establish a self-sufficient and self-perpetuating training system
- provide facilities for job-orientated practical training for all staff levels in a water sector undertaking in skill areas not provided by existing academic and technical institutions.

### Phase I - analysis and planning

During the first phase of developing a training system, effort must be concentrated on analysis of the current and future situation and development of a manpower strategy.

It is essential that a very close liaison is maintained between the Manpower Development team and staff of the undertaking. To gain cooperation and commitment from the senior staff, a short seminar is conducted at the start of Phase I to explain the aims and objectives of the work and the methods to be used. A further seminar is presented at the conclusion of the Phase to enable the findings and preliminary recommendations to be discussed with the senior staff.

In general terms the methodology of this Phase may be summarised under two headings:

Situation and needs analysis involves an initial familiarisation with the undertaking and its work together with any proposals for reorganisation or expansion. This would be followed by an examination of current train-

ing methods and facilities that are available within and outside the undertaking for staff training.

The manpower development and training strategy is then prepared from an assessment of the present arrangements and future proposals as identified in the situation analysis with due regard to the views of the management team of the undertaking. The outline strategy developed would for example try to:
- quantify the total development and training task and resources available
- identify and recommend plans to satisfy short term priorities
- recommend a balance to be aimed for between "on-the-job" and "off-the-job" training.

Specific tasks which are carried out during Phase I are as follows:
- examine the design, construction, operation and maintenance of existing water supply and sewerage systems including support services
- identify proposed extensions of sources, systems, methods and any changes in technological approach
- examine existing and proposed organisational structures
- identify, assess and quantify training needs
- draw up a recommended equipment and tooling list
- identify key task areas and agree job descriptions
- assist and advise in forecasting additional manpower and the range of skills that may be required in the future
- advise on the selection of suitable training staff, and prepare and arrange training programmes
- examine existing methods and facilities for staff training, noting suitable external facilities and any plans for development
- evaluate data, prepare training plans, discuss and agree training implementation strategies with senior staff.

Time required for Phase I will vary depending on the size of the undertaking and the logistical problems of geographical size, but would generally be of the order of two months' site investigation and two weeks' report preparation.

Phase II - Implementation

During this Phase an experienced project leader supervises the implementation of the manpower development and training plan agreed in Phase I and trains counterpart staff to continue future operation of the training system. The Phase is carried out in two stages.

Module and facility investigation/preparation is expected to include the following specific tasks:
- draw up training specifications for key tasks as identified and agreed in Phase I
- specify "off-the-job" facilities required to meet the identified needs and investigate possibilities of setting up and/or extending existing "in-house" training facilities
- enumerate the training manuals required to meet the needs identified in Phase I and commence preparation of the most important
- prepare training courses to meet priority needs identified in Phase I
- advise on design and preparation of "off-the-job" training facilities
- establish a system for monitoring and evaluating training programmes and for the maintenance of appropriate training records
- establish a system for the overall management, financial control and administration of the undertaking's training function.

Manpower development and training is expected to include the following specific tasks:
- finalise arrangements for the overseas training programmes for trainers
- implement training courses to satisfy the key task needs identified in Phase I
- modify and refine the training plans as necessary
- train, advise and counsel counterpart training staff on performance as trainers
- implement induction training courses for new recruits
- implement training courses in line with agreed programmes
- monitor "on" and "off-the-job" training and planned practical experience components of the programmes
- devise a forward training programme for all key staff involved in the day to day running of the organisation
- arrange for follow-up visits by consultants over an agreed period to monitor effectiveness of the programmes
- maintain a dialogue with senior management of the organisation to ensure that they are kept fully informed of the progress and effectiveness of the training function.

Time required for Phase II will again vary depending on the size and geographical responsibilities of the organisation, but is expected to take of the order of two years.

Visiting specialists would be used during Phase II in the development and implementation of training courses in the priority areas identified in Phase I. They will advise on areas of work where new or improved technical methods or equipment are being introduced or the undertaking lacks sufficient in-depth practical experience for counterpart staff to develop appropriate training courses. The duration of these visits is normally one/two months.

Use of the Two Phase Approach

The National Water Council, Overseas Manpower Development Group from the United

Kingdom is currently engaged in assisting the Madras Metropolitan Water Supply and Sewerage Board to establish a training system and training facilities in Madras. Having set out the reasons for, and methodology of the Two Phase Approach, the paper now examines the way in which the Approach has been used in Madras and the potential value of the Metrowater Training Project both for Madras and other water sector undertakings in India.

METROWATER TRAINING PROJECT (MADRAS)

Madras Metropolitan Water Supply and Sewerage Board (MMWSSB)

In 1975 the World Health Organisation initiated a pre-investment study into the water supply and sanitation facilities in the Madras Metropolitan Area. The objectives of the study were to:
- develop systematic long range plans for water supply and waste water systems for the Madras Metropolitan Area
- lay down a programme for obtaining short-term relief from current deficiencies.

One of the goals of the short term objectives was to recommend a programme of training for all levels of water sector staff.

In line with the pre-investment study recommendations, the MMWSSB was established in August 1978 from appropriate staff of the Corporation of Madras and the Tamil Nadu Water and Drainage Board.

The scope of operations of the MMWSSB includes full responsibility for the supply, treatment and distribution of 250 mld of water to domestic and industrial consumers in the Metropolitan Area and waste water collection, treatment and disposal for the area. The Area has a population of approximately 3.5 million, 30% of whom rely on public fountains for water supply and have no provision for sewage disposal.

The staff of the MMWSSB number approximately 6500 of whom 350 are professional staff holding a minimum qualification of a diploma or degree and the remainder are skilled, semi-skilled or labour cadres. Of the total staff approximately 5000 are involved in the engineering operations of the Board.

The water supply and sewerage systems in Madras were installed around the turn of the century. Rapid development of the city and expansion of the population have not been accompanied by adequate improvements to the systems. The MMWSSB is now faced with the dual problems of repairing or replacing old and inadequate facilities and implementing a major programme of new engineering works to bring the systems up to a satisfactory standard. To carry out this work the Board requires staff who have the necessary skills required to design, construct, operate and maintain existing and future facilities.

Initial study

In 1978 the National Water Council carried out an initial study of the situation in Madras and the training needs arising from the work due to be carried out by the newly formed Water Supply and Sewerage Board. The work was carried out following the Phase I Approach outlined earlier and led to initial recommendations in a number of areas.

The situation and needs analysis clearly identified the need for implementation of a substantial training programme in the practical operation of water and sewerage systems. The lack of suitable facilities for this type of training led to the recommendation that the MMWSSB establish its own Training Centre to meet its needs. The training to be provided at this centre would be augmented by the training of key staff in the NWC Training Centres in the United Kingdom.

The manpower development and training strategy set out the method by which the MMWSSB should set up the Manpower Development function, obtain information on current skills and abilities of staff transferred to the new Board against the skills and abilities required in their new posts and recommended a training scheme.

Having determined the need for a separate training facility, the study recommended the size, layout and resources required to meet the priority needs. The recommendations included the manpower and organisational requirements to operate the training facility and proposals for training the staff as Trainers.

Financial assistance was obtained from the World Bank (IDA) and the Overseas Development Administration (ODA) following acceptance of the study recommendations.

The World Bank have provided Rs28 lakhs (Exchange rate Rs16.5/£1, October 1981) for the buildings and Rs6.11 lakhs for equipment and furnishings as a loan. The ODA have granted Rs6.9 lakhs for training equipment in addition to funding the services of the National Water Council.

Establishment of the Training Centre

Terms of reference for the NWC assistance in establishing the Training Centre were based on the Two-Phase Approach and included a re-assessment of Phase I work carried out previously and, if necessary, preparation of a revised training strategy, followed by implementation of the proposals.

Work on the project commenced on 2 July 1979 for a contract period of two years with the

NWC providing a Resident Training Manager.

Initial work concentrated on the appointment of training staff and arranging training in Instructional Techniques at Training Institutes in Madras. The counterpart staff appointed at the start of the project comprised a Training Centre Manager, Chief Training Officer, two Training Officers and two Instructors.

The Board also established a temporary Training Centre in a laboratory within the area allocated for the new Training Centre. The building provided space for two classrooms, a demonstration area, a store and administrative offices and was occupied in December 1979. The design for the new Training Centre was agreed to include two classrooms, administrative offices, course development room in one block, three workshops, a laboratory and an external model water distribution layout.

The original Phase I plans were reviewed and a programme of Specialist visits was agreed for the development of courses in priority areas.

The training equipment and tooling list for the new Centre was prepared for both indigenous and imported items. By January 1980 the Phase I tasks were substantially completed and the training centre was in operation.

Implementation of forward plans centered on the programme of Specialist visits and the development of priority training courses. The Specialists covered the following key areas:

- operation and maintenance of sewage treatment works
- operation and maintenance of sewerage systems
- mains and service laying
- supervisory techniques
- operation and maintenance of water treatment works
- maintenance of mechanical plant
- maintenance of electrical plant
- maintenance of vehicles
- water meter testing and repair
- training course development
- manpower development and training planning.

These courses were aimed at the first line supervisor level which had been identified as the key area. The counterpart training staff modified these courses and developed additional courses in Tamil for the lower cadres. During 1980 a total of 17 courses were developed and presented to 500 trainees.

The training of counterpart staff continued with a four month training programme at the UK Water Sector Training Centres for the Training Centre Manager and Chief Training Officer and with the local training of two additional Training Officers.

By May 1981 much of the Phase II work was complete but because of delays in the construction of the new buildings and delivery of training equipment from the UK, the contract was extended until March 1982.

Consolidation of Phase II continued and in addition to developing a further 11 courses during 1981, visiting Specialists supervised the start of an individual training needs analysis of operation and maintenance staff. Work is still continuing on this study but initial work has resulted in a programme of training courses to be prepared for the new Centre for 1982. This will cover 42 courses with 4200 trainee places. Before completion of the project a forward programme for the Training Centre operation will be prepared for the next three to five years.

The new Centre is scheduled for completion in March 1982 and an additional eight trainers will be recruited.

Overseas training of key personnel has continued with eight British Council Training Awards having been utilised by the end of 1981.

## THE FUTURE

The use of the Two-Phase Approach has enabled the MMWSSB to establish a training function to meet the Board's present and future needs in a systematic manner.

The opening of the Metrowater Training Centre in 1982 will provide Madras with the first training facility in India designed for water sector staff of all levels.

The facilities have been designed to provide job-orientated practical training and it is intended to make the facilities available to other water sector undertakings in India.

The application of the approach outlined in this paper will assist Developing Countries to meet the training needs created by the implementation of the Decade Programmes and improved standards of operation and maintenance of existing facilities.

## ACKNOWLEDGEMENTS

The author wishes to thank R P J Turrell, Overseas Manager, National Water Council, Overseas Manpower Development Group and T K A Dewan Mohamed, Managing Director, Madras Metropolitan Water Supply & Sewerage Board for permission to publish this paper.