ITU/TETRAPRO TELETRAFFIC ENGINEERING TRAINING PROJECT

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ABSTRACT

Training of traffic engineers within the developing countries is made possible by the ITU/TETRAPRO project by programmed courses, which preferably should be combined with on-the-job training. A basic course "Teletraffic Engineering" is available through the ITU/CODEVTEL sharing system. The course starts at B.Sc. level and gives comprehensive training in traffic engineering. Further specialized courses are being developed in advanced traffic engineering areas.

1. AIM OF PROJECT

The project aims at making it possible for developing countries to train their traffic engineers within the country. This will ensure that the countries can efficiently plan and operate their telecommunications networks.

2. PROCEDURE

Course material will be produced for the whole subject area, containing texts, exercises as well as instructions for the teacher, according to the CODEVTEL system. The instructor's guide will contain lesson plans, overhead pictures, solutions to exercises, tests with their solutions and scoring keys. The extensive and complete material will make it possible to conduct the courses by the country's own teachers.

3. WHY COURSES AND NOT SEMINARS?

Experience shows that seminars on more or less advanced subjects have very little impact on the traffic engineering skill in developing countries. The main reasons seem to be:

- The participants lack sufficient background knowledge to assimilate the subject. (Wrong persons sent to seminar)
- Too short time to permit complete understanding of complicated matters. It is not enough time understand a new method and to learn to use it. (A seminar is generally 1, 2 or 3 weeks; the one-week seminar being the most common)

The courses are conducted at a lower speed and provide a better environment for learning and to individually practice a new method. The training becomes still more efficient if combined with on-the-job training. Further: It is easier for the administration to release its engineers for, say, one day per week than for continuous periods of several weeks and months.

4. COURSES

The course package comprises the following:

- TELETRAFFIC ENGINEERING

This course provides the general background for further advanced traffic engineering. The course starts at B.Sc. level and gives the theoretical background for all applications as well as their practical use. The training time is about 16 weeks. After this course and some practical work, the student can enter the specialized courses listed below.

SPECIALIZED COURSES:

- SUBSCRIBER AND TRAFFIC FORECASTING
- TRAFFIC MEASUREMENTS
- DIMENSIONING OF SWITCHING SYSTEMS
- DIMENSIONING OF TRUNK AND JUNCTION NETWORKS ("Network planning")
- TRAFFIC ENGINEERING PRACTICES AND MANAGEMENT

These courses will cover the latest and most advanced methods in their fields. Since the background knowledge is secured by the basic course "TELETRAFFIC ENGINEERING", these additional courses are estimated to take only 2 - 4 weeks each.

ELEMENTARY COURSE

This course concerns training of assistants to the traffic engineers. It is being developed by Siemens & Halske, Munich. The design of this course made it necessary of a close analysis of all traffic engineering work procedures.
5. FINANCING THE PROJECT

Initially it was planned that a number of experts should take part in the work and that it should be completed within 2 - 3 years. Difficulties arose however to find the money for carrying through the project, since ITU has no own funds for technical assistance. Fund were not available by UNDP and other donors. The work could however start late 1978 by the assignment of the project manager through contributions from Ericsson, Sweden, which company since then has supported the project financially.

Later on, the Government of the Netherlands provided an expert for 15 months, which made it possible to carry through a pilot course in India.

Further contributions were given by the Swedish Telecommunications Administration, by the British Telecom and by the Indian Posts and Telecommunications Administration by providing office facilities for the project. The latter organization also provided the training facilities for the pilot course.

The project has been supported by an Advisory Working Party which has met 7 times. The AWP was composed of members from supporting organizations and the ITC Training Working Party, as being the initiator of the project. Besides advising on extent, content and design of the courses, the individual members of AWP have given valuable contributions to the course material. The members of AWP have taken part in the work in kind.

The Elementary Course is being developed by Siemens & Halske, Munich, as a contribution to the United Nation's World Communication Year.

6. WORK ACCOMPLISHED SO FAR

The course material for TELETRAFFIC ENGINEERING is now available through the CODEVTSEL Sharing System. The material consists of the following number of A-4 pages:

- Text: 1000
- Exercises and solutions: 300
- Instructor's guide: 200
- Lesson plans: 750
- Tests, answers, scoring keys: 300

This type of programmed training requires much more material than ordinary text books used at universities. In fact, text and exercises are only about 40% of the total material. The comprehensive course material will reduce the teacher's preparation time, but it is still assumed that he has traffic engineering experience.

A trial course has been conducted in India, at the Advanced Level Telecommunication Training Centre at Ghaziabad, outside New Delhi. The outcome of this course has influenced the final design of the course.

It is considered as important that the traffic engineers can present the numerical results of their work. Therefore, programmable pocket calculators have been used for the exercises. This is also a good introduction to the programming of more powerful computers.

A pilot course in TRAFFIC MEASUREMENTS will be conducted in Finland in the autumn of 1985. It has been made possible by the assistance of the Finnish Aid Authorities. This course, as well as the other specialized courses are expected to be available in 1986.

7. THE FUTURE

The TETRAPRO project seems to become completed in 1986. New methods and new applications will appear in the future. This will require up-dating and new courses may be desirable.

It is also desirable that the education in traffic theory and its applications at technical universities is improved.

8. FUTURE TASKS FOR ITC/TWP

The ITC Training Working Party should consider it as its task to advise the ITU on updating and extension of the TETRAPRO courses. It should further work for improved courses at universities on traffic engineering. If it is improved in the developed countries, the developing countries will certainly follow.

9. CONCLUSIONS

To extend a telecommunication network both money and trained staff is required. The financial problems can in many cases be solved, but without trained staff it will be impossible to run the networks efficiently. It generally takes longer time to train the staff than to install the new equipment. Training must therefore start early. In the preparations, skilled traffic engineering is needed early in the planning. The value of skilled traffic engineering cannot be over estimated. Mistakes in the dimensioning have severe economic effects, which only rich countries can afford to take.

Developing countries must use their scarce resources in the best possible way. The training must take its time and there are no short-cuts in learning this profession.
REFERENCES


A. Ellidin, "Teletraffic Problems in Developing Countries", Ericsson Review, vol. 54 (No. 4, 1977)


CODEVTEL = "Course Development in Telecommunications" is a universal ITU project. Countries in all parts of the world cooperate in producing courses on telecommunication subjects. The idea is that the same course (after adaptation) can be used in more than one country and that duplication work can be avoided if the countries exchange courses. The exchange is handled by the ITU Training Division and it is referred to as the ITU/CODEVTEL Sharing System. To make courses universally adaptable CODEVTEL provides also guidance on course standards and formats, as well as on the procedures for course development. The TETRAPRO courses will be available through this sharing system.

For further information on CODEVTEL, see ERNBERG below in the references!

ADDITION

The course material for Teletraffic Engineering has also been used in two courses conducted by international traffic engineering experts. In Dhaka, Bangladesh, a 12 week course was held in 1982 and another course was run in Amman, Jordan, comprising 8 weeks. The latter course used the material for the first part of the Indian pilot course. The course was conducted in the last quarter of 1983.

Both courses gave valuable information for the design of the TETRAPRO course.