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**JOINT UNIDO/SWISSRAIL WORKSHOPS ON
RAILWAY TRANSPORT DEVELOPMENT**

US/INT/87/124

US/GLO/88/234

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US/RAF/93/012

Report of the evaluation mission*

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EXPLANATORY NOTES

BAWI	-	Bundesamt fuer Aussenwirtschaft
COMFAR	-	Computer Model for Feasibility Analysis and Reporting
DSA	-	Daily Subsistance Allowance
HRD	-	Human Resources Development
HTO	-	Host Training Organization
IDF	-	Industrial Development Service
IPS	-	Investment Promotion Service
MIS	-	Management Information System
OFT	-	Federal Office of Transport
P-Way	-	Permanent Way
QAC	-	Quality Assurance & Control
R&D	-	Research and Development
SFR	-	Swiss Federal Railway
SNCFT	-	Tunisian State Railways
TOR	-	Terms of Reference
UAR	-	Union of African Railways
UNDP/IPF	-	United Nations Development Programme/Indicative Planning Figure
WB	-	World Bank
ABB)	
ACM)	Swiss Railway Members (companies)
SLM)	
EBO)	

Chapter I

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

1. The programme as a whole was perceived by most of the participants as relevant for their railway companies. However, the programme contents were too broad to ensure the relevance of each programme component for each participant and the duration of the workshop was too short to deal with all the topics in sufficient detail.

2. Assessment of the production of Outputs as defined in the current project documents is negative: none of the Outputs (a technical report including an outline of an interregional training programme; project proposals for strengthening the "national engineering services and training" elaborated with each participant; tentative agreements for cooperation with SWISSRAIL members) was produced. However, this reflects to a great extent the design deficiencies rather than the effectiveness of the programme.

3. On the basis of the analysis of the project documents the evaluation team proposed a reformulation of the Project Objective and Outputs as specified in paragraph 42.

Out of the 3 newly formulated outputs the Outputs 1 and 3 were produced fully. Output 2 was produced to a very limited extent only.

4. Neither UNIDO nor SWISSRAIL had any information about the use of the project outputs in the field. The evaluation mission found evidence of the use of the project results. The documentation was used frequently by the former participants. In some of the countries under review the outputs were used by the participants to initiate technological or managerial changes and improvements; some of these proposals are still under consideration by top management, some are being verified on a pilot basis, and a few have been implemented. In some cases the acquired new information supported the preparation of technical specifications for tenders and their evaluation, or the introduction of new technology which had been decided upon independently of the participation of the country at the workshop. Established cooperation contacts with SWISSRAIL members were also recorded.

5. Impact in measurable terms could not be identified by the evaluation mission. It is, however, presumed that the use of the outputs described above (in particular of the information acquired at the workshop) brought about economic and other (social, environmental) benefits in very different, though not easily discernible forms.

6. The following shortcomings in the project documentation affected the implementation of the project

- some parts of the Terms of Reference for the preparation of the country papers were not coherent with the outline of the issues to be addressed by the workshop and some parts of the text were even difficult to comprehend so that they could hardly contribute to the preparation of the country papers as desired;
- the Aide-Memoires did not contain detailed contents of the workshop;

- not enough lead time was provided for the selection of the participants and their preparation for the workshop so that the country papers were received too late to be considered in the preparation of the workshop programme.

7. As the number of candidates was lower than the target number (20), all applicants were selected. The groups were rather heterogenous. The heterogeneity of the participants was compounded by the heterogeneity of the participating countries/railway companies. This factor also contributed to a rather limited interaction among the participants.

8. The delivery of lectures, company presentations and technology demonstrations were conducted in most cases in a very satisfactory way. Technology demonstrations were considered by the participants as a very useful form of exposure to technology development. Most of the supporting documentation was of good quality, the documentation of SFR was excellent. A few company presentations, however, were supported by company promotional literature only.

9. In spite of the gap between the technology applied by the railway companies of the participating countries and that demonstrated at the workshop, the technology demonstrations had the value for the participants of setting reference standards which might help the railway companies in, for example, formulating technical specifications for tenders and evaluating these.

10. Expenditures were in all cases well below the original budget costs. Actual total costs were, however, considerably higher than actual expenditures debited to the project budget because of the high inputs of SWISSRAIL in kind and because of extensive administrative work on the part of both SWISSRAIL and UNIDO.

11. The forward-looking assessment of the training and awareness raising needs in the visited countries indicated that the needs are very broad and diverse. However, areas of general management of railways companies, and in particular the economic evaluation of technological, operational and organizational changes, were considered of utmost importance by most participants.

12. The following main recommendations were proposed to increase the relevance, effectiveness, efficiency and impact of the programme:

- The diversity of the contents of the workshop programme should be reduced so that each topic can be addressed in a more profound way and more time be made available for discussion of the countries' problems, assessment of the applicability of the new techniques and technology and for interaction among participants. The technical issues should be clustered in the following fields:
 - * rolling stock;
 - * infrastructure;
 - * operations.
- Each workshop should focus on one technical field only.

The general management issues should be maintained as a common component in all workshops.

The duration of the workshop should be extended. More time should be allotted for interaction among the participants and for discussion of the possibilities and constraints in applying the newly acquired information and knowledge.

The workshops should be targeted primarily at top and middle level managers of the railway companies responsible for the types of work covered under the content of the workshop.

In view of the importance given to demonstrations of advanced technologies and management systems the workshop should be targeted at countries with larger and more developed railway systems. The number of invited countries per workshop should be reduced to 5 - 7, preferably from the same region.

As far as possible, company lectures/demonstrations, while centered on the company's technology, should also provide general information about current trends in technology development.

13. The evaluation reveals a certain dilemma for UNIDO: while the programme is relevant and fairly effective in that the outputs are used, its small size (with support costs exceeding considerably the support cost reimbursement) is not compatible with the current UNIDO policy aiming at developing large projects in a reduced number of areas of concentration. The programme has not become a generator of technical cooperation projects with UNIDO either.

If UNIDO, in spite of that, includes development cooperation with the railway sector among its areas of concentration, then its professional competence in this area should be strengthened and close coordination of all training and awareness raising activities in the railway sector introduced.

14. More detailed Conclusions and Recommendations are in Chapters 6 and 7 respectively. They include a proposition for an alternative concept of the workshop the implementation of which, however, may require a shift of the HTO function from SWISSRAIL to SFR. Such an institutional change will probably be accompanied by additional costs for re-conceptualization and running-in of the project.

Chapter 2

INTRODUCTION

Joint UNIDO/SWISSRAIL Workshops on Railway Transport Development

15. Since the inception of the programme, four workshops were held. The following table provides an overall picture of the UNIDO/SWISSRAIL workshops which have been carried out:

Table 1: Joint UNIDO/SWISSRAIL Workshops 1987 to 1993

<u>Dates</u>	<u>Place</u>	<u>Number of participants</u>	<u>Participating countries</u>
22-28 November 1987	Zurich	15	Ghana, Indonesia, Jordan, Nigeria, Pakistan, Philippines, Turkey, Zimbabwe
23-29 April 1989	Zurich	12	Argentina, Brazil, Ecuador, Ghana, India, Indonesia, Malaysia, Turkey, Zimbabwe
22-28 April 1990	Baden	19	Bangladesh, India, Indonesia, Iraq, Kenya, Malawi, Malaysia, Philippines, Turkey, Uganda
15-19 March 1993	Yverdon	18	Algeria, Cameroon, Ivory Coast, Madagascar, Mali, Morocco, Romania, Senegal, Tunisia
Total:		64 participants	27 countries

The first three workshops were conducted in English, the fourth workshop was primarily targeted at French speaking African countries and as such was conducted in French.

The number of participants from individual countries at each workshop is indicated in Table 2.

Parties in the Joint Programme: SWISSRAIL and UNIDO

16. The programme under evaluation was carried out by SWISSRAIL and UNIDO.

17. **SWISSRAIL** is an export association of more than 60 Swiss industrial firms and consultancies dealing with guided transport systems, financed by contributions of the member. It cooperates closely with the Swiss Federal Railways (SFR) and public transport authorities and organizations such as the Federal Office of Transport (OFT) and the Institute of Transportation, Traffic, Highway and Railway Engineering. The capabilities of its member companies range from planning and project engineering to supply of equipment and technology transfer. Thus **SWISSRAIL** has the capability to organize and establish contacts with sources of high-level expertise related to many areas of guided transport systems.

While SFR and the public transport authorities and institutions are also on the list of **SWISSRAIL** members, their position is different in that they are non-paying members and their linkages to **SWISSRAIL** are looser (associated members). This distinction is important for the organization of the workshops. While the General Manager of **SWISSRAIL** has received full support for the workshop from the associated members in the form of lectures/presentations and site visits, the priority concern of the General Manager is with the network of full members.

For **SWISSRAIL** the cooperation programme with UNIDO is asserted to be a stand alone programme. **SWISSRAIL** does not run similar programmes nor do these workshops explicitly support other **SWISSRAIL** programmes. Occasionally **SWISSRAIL** organizes symposia on specific issues such as a recent symposium in China on tunnels. A meeting with a broad coverage in India is under preparation.

18. UNIDO has been active in the railways sector for many years, mainly by organizing interregional or regional workshops and group training programmes for different railway-related target groups from developing countries. With this aim UNIDO has conducted a number of group training programmes both for English and French speaking developing countries in co-operation with host training organizations in Austria, Belgium and the United Kingdom. In most of these programmes concentration was on specific fields such as: (i) Repair and maintenance of Railway Rolling Stock; (ii) Management and Rehabilitation of Railway Rolling Stock; (iii) Maintenance and Manufacturing of Permanent Way, (iv) Maintenance of Railway infrastructure and (v) Supplies and Stock Management of Railway Spare Parts. The duration of each of these programmes varied from 2 to 3 months. The workshops conducted in Austria lasted two weeks; the last one (Linz, September 1994) was devoted to "Economics in Railway Infrastructure".

The above mentioned training activities have been backstopped primarily by UNIDO Human Resource Development Branch. In addition to the training activities UNIDO has implemented some technical cooperation projects in the railway sector, such as development of a prototype of a diesel engine for locomotives in China. These projects have been backstopped by the Engineering Branch. In recent years the transportation section within the Engineering Branch has focussed on environmental aspects of road transport vehicles and railway rolling stock, which in practise results in a focus on improving the environmental parameters of engines and supporting the introduction of intermodal transport.

Background to the evaluation and its conduct

19. The evaluation of the Joint UNIDO/SWISSRAIL Workshop Programme on Railway Transport Development was requested by the Federal Office for Foreign Economic Affairs, Trade Section, Development Policy Division, Berne, through a letter dated 6 June 1994.

20. The Terms of Reference (TOR) for the evaluation exercise were cleared and accepted by the above authority in Berne through a letter dated 24 August 1994. They are attached as Annex 1.

21. The purpose of the evaluation is to assess the relevance, efficiency, effectiveness and impact of the Joint UNIDO/SWISSRAIL Railway Transport Development Workshops Programme.

22. As requested by the Federal Office of Economic Affairs, the training beneficiaries were supposed to be interviewed (or answer a questionnaire) in order to assess the effectiveness and impact of the programme in the field. The selection of countries for field investigations was affected by the fact that participation at the workshops included many countries with a relatively low number of participants from each country (see Table 2). In order to keep the costs of the evaluation low it was proposed by UNIDO to confine the field missions to a few countries with a higher number of participants and, to the extent possible, a shorter travel distance. In the TOR three countries were specified: India (8 participants), Turkey (4 participants) and Tunisia (3 participants). In addition a provision was made in the TOR for a national consultant to conduct interviews in Indonesia (5 participants).

23. In the course of preparation for the evaluation, the mission of the international consultant to India had to be substituted by recruitment of a national consultant (to conduct the interviews together with one staff member of the Evaluation Section). This arrangement made it possible to include one more country (Romania, 2 participants) in the itinerary of the field mission without exceeding the budget. Inclusion of Romania was important and useful because it (i) balanced the country coverage of the exercise by including participants from the 1993 workshop and (ii) increased the number of participants interviewed.

24. The evaluation mission team comprised:

Mr. Jaroslav Navratil - UNIDO Evaluation Section, Team Leader

Mr. Joris Verbiest - UNIDO consultant (Société Nationale des Chemins de Fer Belges)

In addition, the interviews in India were conducted by

Mr. Imran Farooque - UNIDO Evaluation Section

Mr. J.S. Mundrey - national consultant (India)

25. The evaluation exercise was carried out from 31 October to 18 November 1994. The field investigations were carried out from 3 to 11 November 1994. The itineraries are in Annex 2.

26. The evaluation team reviewed the files available at UNIDO and interviewed UNIDO staff members associated with the programme now and in the past. Due to several changes of the backstopping sections and officers only the files of the 1993 workshop are kept by the present backstopping section (Engineering). The files of the previous workshops were provided by the Archives section. Workshop documentation (lectures and other handouts) was not readily available at UNIDO (except for some country papers).

27. At the beginning of the evaluation the team leader and the external consultant had discussions with the Swiss Federal Office for Economic Affairs, Trade Section, Development Policy Division in Berne and with the General Manager of SWISSRAIL in Winterthur. The representatives of the Federal Office stressed their wish to see a forward-looking component included in the evaluation.

28. In addition to an extensive exchange of views with the General Manager of SWISSRAIL the evaluation mission was provided with comprehensive workshop documentation on the basis of which it was possible to review the contents of the workshops. While the documentation for the 1993 workshop was considerable in terms of its volume, the documentation for the previous workshops (1989, 1990) was less extensive, but did provide sufficient insight into the contents of the workshops.

29. After the above mentioned consultations the evaluation team finalized the questionnaires for interviews with former participants and their supervisors (Annexes 3 and 4) and a questionnaire for the assessment of the training needs ("Structure of Potential Training Needs in the Field of Railways", Annex 5.) The "Structure" was prepared by the evaluation team in order to facilitate communication with the former participants and other personnel in the Railway companies for the purpose of assessing and identifying the most pressing training and awareness raising needs in the railway sector.

30. The following countries were visited for the purpose of field investigations/interviews:

	<u>No of participants at the workshops</u>	<u>No. of participants interviewed</u>
India	8	6
Tunisia	3	3
Turkey	4	2
Romania	<u>2</u>	<u>2</u>
Total	17	13

Additionally, four participants (out of the total number of five) were interviewed by a national consultant in Indonesia. While the national consultant's report could not convey information with the same intensity and richness as personal interviews by the evaluation team itself, the information was relevant and was used by the evaluation team. This arrangement also proved to be cost-effective.

31. The availability of former participants for interviews was relatively high, particularly if one considers the reasons for non-availability (one passed away, one had a long-term assignment abroad, one was stationed far from the place of the interview, two high-level

ministry officials were on missions abroad.) At the same time the evaluation team could benefit from the availability for interview of some former participants who in the meantime had either retired (two in India) or left the Railway Company for another job (one in Turkey).

32. The picture is less satisfactory as regards supervisors of the former participants. Some of the former participants were high-level managers or ministry officials (in Turkey, for example, at the level of Under-Secretaries). It thus made no sense to contact their supervisors. Some supervisors were not available for interview because of time constraints and some of them declined (in Indonesia). Thus only one supervisor was interviewed (in Romania).

33. The evaluation team also had at its disposal responses to simplified questionnaires, received from the former participants by correspondence. These responses were received from Malaysia (1), Cameroon (2), Morocco (2), Ivory Coast (1), Algiers (3), Jordan (2). This increased the number of countries covered to 11 (41%) and the participant response to 27 (42%). The quality of the responses received by mail varies but the experience acquired by the evaluation team in the course of the interviews made it possible to make good use of most of the mailed replies. The high rate of return (25%) of the questionnaires by mail is in itself a positive indicator of the image of the workshop.

34. Except for the Philippines (none of the four former workshop participants is employed by the Railway company any more) the stability of employment among participants in the railway sector is considerable. Only 7 out of 33 former participants traced by the UNDP/UNIDO field offices had changed jobs to work outside the railway or transport sector.

35. Throughout all visits and interviews the evaluation team was extended full support and cooperation.

Chapter 3

PROJECT DESIGN AND DOCUMENTATION

36. The term "programme" is used in this context to describe the series of workshops, each one of which is considered to be a separate technical cooperation project for which separate project documentation (project document, aide-memoire, workshop programme) is prepared.

Origin of the Programme

37. The programme resulted from an initiative of SWISSRAIL that initially was interested in joint implementation of a technical cooperation project. In the course of discussions a concept was developed with the then Non-Governmental Organizations Section of UNIDO to conduct jointly workshops providing high level managers and decision makers of railways and transport ministries with information on advanced railway-related technologies and management systems. In addition to the benefit to the participating countries the concept implied that UNIDO would use the workshop as an instrument to identify and formulate demand-relevant technical cooperation projects while SWISSRAIL would be given the opportunity to demonstrate the technical and managerial capabilities of its member companies and thus promote Swiss industry.

Project document

38. The above concept is to a certain degree (but without respect for internal logic) reflected in the project documents on the basis of which the workshops were approved by UNIDO for submission to BAWI for funding. The project document for the most recent (1993) workshop indicates the following objectives and outputs:

(a) *Project objectives*

- (i) *To provide up to 20 high level railway engineers, technicians and managers from developing countries with information on and demonstration of the latest techniques in management, safety, repair and maintenance, spare parts production and the manufacture of railway equipment; and*
- (ii) *To provide the opportunity to review and discuss these techniques, their applicability in the participants' countries and the possibilities for introducing them.*

(b) *Outputs*

- (i) *A technical report on the methodology and modalities of the development of national level programme on rolling stock, R&D engineering services and technical manpower development, including an outline of an interregional training programme project for interested developing countries.*

- (ii) *Based on the individual country papers prepared by the participants before the workshop, elaboration of national level project proposals with each of the participants from the developing countries on the individual technical assistance requirements for strengthening the "national engineering service and training" for submission to his/her government for implementation under UNDP IPF finances or through other sources of finances.*
- (iii) *Tentative agreements for industrial cooperation activities between SWISSRAIL members and the participating developing countries.*

39. The above structure of project objectives and outputs has been maintained in principle without any significant change in the last three project documents (project document for the first - 1987 - workshop is not traceable). The following modifications can be detected:

- Project document for 1989 contained also a Development Objective:

"The development and strengthening of capabilities of public and private railway organizations in developing countries through improved management techniques; new and effective repair maintenance schemes; and the transfer of modern railway technology in the manufacturing of railway equipment."

The Development Objective does not appear in the project document for the 1990 and 1993 workshops (apparently because the UNIDO Project Design Guidelines did not require the formulation of a Development Objective for small projects below \$150000).

- In the project document for the 1990 workshop the third output ("tentative agreements for industrial cooperation activities...") was added for the first time.
- In the project document for 1993 the number of workshop participants ("up to 20 high-level railway engineers...") was specified in the project objective for the first time.

40. The changes introduced in the project documents are not significant so that the analysis of the project document for the 1993 workshop can be considered as valid for all of them.

First, it is apparent that the project document lacks internal logic. The outputs and project objectives specified in the project document do not follow the means-end relationship as required by design guidelines applying the logical framework.

Second, outputs (ii) and (iii) are very ambitious; it can hardly be expected that *project proposals with each of the participants from the developing countries* and *tentative agreements for industrial cooperation with SWISSRAIL companies* can be elaborated in the course of a five-day workshop, which devotes most of the time to lectures and demonstrations. The Appraisal Memorandum of US/RAF/93/012 (issued 25.1.1993) stated that the two outputs had not been produced by the previous workshops but assumed that they could be produced if more attention was given to the selection of participants in charge of decision-making and

from the government institutions. This was discussed with the General Manager of SWISSRAIL who attended a special appraisal meeting (20 January 1993). The reality proved that again the outputs were not produced.

Third, the fact that the wording of the outputs was copied from one project document to another suggests that little thought was given to the contents, even though there was evidence that the outputs had not been produced in the preceding projects.

41. As the design was found inadequate, it was revised (re-engineered) by the evaluation team with the purpose of

- providing a meaningful basis to assess the production of outputs and achievement of objective(s) of the project (as viewed by the evaluation team)
- offering a proposal for consideration by planners of future projects of this type.

42. The evaluation team proposed the following revision of the project objective and outputs:

Project Objective (Purpose):

To initiate and/or facilitate the introduction of managerial and technological improvements in railways companies and/or railways-related industrial enterprises in selected developing countries in the areas of safety, repair and maintenance, spare parts production and the manufacture of railway equipment.

Indicators:

Management decisions about the analysis of proposals (made by workshop participants) for specific technological or managerial improvements

Management decisions about introduction of specific technological or managerial improvements proposed by the workshop participants

Arrangements for industrial cooperation between railway company industrial enterprises in the developing country and SWISSRAIL members

Proposals for technical cooperation with UNIDO

Outputs

- 1) *Up to 20 high level railway engineers, technicians and managers from developing countries provided with information on and demonstration of the latest techniques in management, safety, repair and maintenance, spare parts production and the manufacture of railway equipment*
- 2) *Country-specific assessments of problems and needs in the areas defined above (as described in the country papers) as well as of the applicability of the new technologies*

and techniques demonstrated at the workshop in the participants' countries and the possibilities of introducing these techniques and technologies.

3) *A consolidated set of reference material reflecting the main topics presented at the workshop*

43. The revision reflects the following design principles:

- A project should have only one Project (Immediate) Objective (=Purpose)
- Outputs should be realistic in the sense that their production is within the authority and capability of the project management; in other words, project management can guarantee the production of the outputs
- Use of the project Outputs by the beneficiaries (outside the project) results in the achievement of the Project Objective (Purpose)

44. The fields in which information is to be provided and new techniques and technologies demonstrated were selected by UNIDO and SWISSRAIL without detailed needs analysis in the field. However, the project documents envisage that detailed programmes of the workshops would be elaborated based on the requests of the participants from the invited countries which were supposed to be submitted to UNIDO. Those requests should have reflected the needs of the invited countries; they also should have formed the basis for future cooperation.

This stipulation in the project document is very sound and could have contributed to strengthening the demand-orientation of the projects. However, as it was repeatedly experienced that the arrangement did not work, the stipulation gradually became an empty formula.

45. Participants' profile as defined in the project documents remained the same throughout the programme: senior government officials, general managers or senior engineers. Emphasis on high-level decision makers from railway companies and transport ministries as the primary target group was an important component of the original concept of the programme.

Aide-Memoire

46. The purpose of the Aide-Memoire is to provide the invited organizations and future applicants with comprehensive information about the workshop to enable proper selection of candidates and preparation of the applicants for the workshop. It should serve as the programme prospectus. As such the Aide Memoires were not adequate. The workshop programmes as contained in the Aide-Memoires were too general and it was not possible on the part of the participant to ascertain specifically what he/she might acquire or derive from the workshop programme.

47. Apart from that the outline of the workshop programme was inconsistent with the attached Terms of Reference for preparation of country papers. While the outline of the workshop in the Aide-Memoire covered several areas from general management to issues regarding track operations, the TOR for country paper emphasized rolling stock, without explaining the reason for this focus on rolling stock only, if there had been any. This

dichotomy prevailed in all four workshops and confused particularly the participants with background in infrastructure.

48. In addition, some parts of the text of the TOR for country papers were blurred so that they could not serve as a meaningful guidance to the participants in their preparation of the country papers.

49. TOR for country paper preparation and the workshop programme as reflected in the Aide-Memoire for all four workshop programmes were always the same. This implies that no effort was made to reorient them with reference to each workshop programme, rather they were simply copied without any changes from one workshop to another.

50. The coverage of the Aide Memoire can also be improved to include workshop-relevant background information about the host country.

Workshop programme

51. For each workshop a programme was prepared by SWISSRAIL which was agreed upon with UNIDO. All workshop programmes were at the disposal of the evaluation team except for the workshop programme for the 1987 workshop, from which one page was missing in the Archives' file.

52. According to the project documents, detailed programmes of the workshop should have been elaborated "based on the requests of the participants to be submitted to UNIDO." However, in reality no requests came from the invited countries. The 1993 programme was prepared with consideration of two factors:

- objectives of the project as formulated in the project document
- readiness of the SWISSRAIL members to participate in the programme (solicited through a letter to SWISSRAIL companies).

If there were any references to specific problems in the country papers, they did not influence the workshop programme substantially since most of the country papers were received by SWISSRAIL a few weeks or days before the beginning of the workshop. The Project Director, however, extracted such references to specific problems mentioned in the country papers and informed all lecturers about them, asking them to pay special attention to these interests whenever applicable.

53. The duration of each workshop was 5 days.

54. Workshops consisted of a blend of lectures, technology, equipment and system demonstrations and site visits. This arrangement proved to be very effective. In fact one participant, a former top manager in a railway company who had had many opportunities to visit railway companies in advanced countries confirmed that this arrangement for transfer of information and knowledge was much more effective than individual visits to railway companies and their facilities. Some participants stressed the effectiveness of demonstrations ("to see through one's eyes is more effective than to read about it").

55. In spite of common features there were some differences between the first three workshops on one side and the fourth workshop on the other. They were to some extent associated with the change of the General Manager of SWISSRAIL in 1991.

The first three workshops (conducted in English) were held in the vicinity of Zurich. Much time had to be allotted to travelling from one site to another. The programmes included 2 to 3 company visits/presentations and the last afternoon of the programme was dedicated to presentations of SWISSRAIL company members. No time was foreseen in the workshop programme for organized discussions among participants. Country papers, if prepared, were not discussed and round table discussions were not held.

The 1993 workshop (in French) was planned to be held in Fribourg (but was actually conducted at Yverdon). The number of lectures and company presentations was increased. Up to 40 % of the programme was dedicated to company presentations. Compared to the previous programmes, a large number of presentations in the field of railway infrastructure and more specifically in the field of electric traction (catenary, isolators) were added. A presentation of UNIDO experience in the field of human resources development in the railways sector was also included. A round table session was introduced during the first day to enable each participating country to present information on its network and discuss company needs and problems.

Although a number of new presentations and lectures were added, and the programme considerably extended, the SFR input could be kept at more or less the previous levels.

56. An assessment of the relevance of the entire programme, and of each subject, was made by the evaluation mission. Consideration was given to the perception of the programme's relevance by participants as expressed in the 1993 end-of-workshop evaluation (the only one available), in mailed responses and during interviews. However, one should be aware of the dependence of the participant's perception of the relevance of the programme on his/her professional profile. While the target group was described as "government decision makers, general managers, high-level mechanical or transport engineers concerned with railway operation, maintenance and management", some participants had a specific technical background. This affected their assessment of the relevance of the workshop programme during the interviews. Some topics dealt with at the workshop were considered by the participants with narrower technical background as "interesting but not relevant".

57. The evaluation mission further found that the perception of the relevance of the programme was affected not only by the professional profile of the participants, as mentioned above, but also by the linkage and similarity of issues affecting the SFR and the participants' networks. Perceptions by participants differed according to the dimension and performance level of each network represented. Participants from large railway networks (India, Romania, Turkey) reacted positively, whereas other participants sometimes stated that the differences were too large ("We don't share the same reality").

58. In general, the workshop programme was found useful by all participants. However, the programme contents were too broad to ensure the relevance of each programme component for each participant. The need to better focus the contents of the programme, to

lay greater emphasis on specific disciplines and to target participants discipline-wise, was common to most responses and the evaluation team shares this view fully.

59. The relevance of the programme was also affected by the way the workshop was implemented. For example, the choice given to participants to visit either a wagons or a locomotive workshop was a very effective arrangement to increase the relevance of the programme for the participants. Detailed analysis of individual programmes is in Chapter 4.

Needs Analysis

60. As already mentioned, no field analysis of the training or awareness raising needs of the railway sector in the developing countries was conducted before the programme was started or before each workshop was prepared. Perception of the problems of the railway sector in the developing countries and its training and awareness raising needs was derived from various reports and publications as well as contacts with the representatives of the sector, technical cooperation activities as well as from the other training programmes of UNIDO in the railway sector.

61. The evaluation team intended to use the opportunity of contacts with the former participants and with the railway companies in general to contribute to a clearer perception of the training and awareness raising needs of the railway sector. In order to facilitate communication with the railway staff, a "structure of potential training needs in the field of railways" was elaborated (see Annex 5). This "structure" is derived from the most important areas that exist in each railway enterprise. It contains a structured list of specific professional fields in which training may be required. After consultations with UNIDO and SWISSRAIL the list was amended and enlarged, among others with the themes "rehabilitation", "research and new technologies" and "intermodal transport".

62. The list served as a "menu"; former participants and other railway staff were asked to indicate on the above mentioned lists what they considered to be the most urgent training needs of their railway company. In one case (Turkey) a consolidated position of the railway company was offered.

63. A typical spontaneous response was that most of the areas on the list were important, that the needs for training and awareness raising were immense and whatever was done was useful. When asked to select only a limited number (five at most), the selection process seemed to be difficult as the participants tried not to be influenced too much by their professional profiles and interest.

64. Taken together, a variety of subjects emerged, which indicates that training needs in the field of railways cover a multitude of disciplines. It is, however, significant that, although many participants had a technical background, all of them indicated among priority areas those in the field of *railway management*. The most frequently selected areas in the field of railway management were

- * corporate planning, economic evaluation and feasibility studies, investments
- * data processing, operational management information systems

- * human resources management
- * materials management, supply planning, stock control
- * financial management
- * deregulation, privatization
- * safety regulations
- * marketing and sales strategy

65. Selected priority areas in the technical subjects were very diverse. The most frequently selected areas were:

Operations :

- * intermodal transport
- * running time calculation
- * time table simulation
- * personnel planning and management
- * train crew planning and rolling stock utilization

Rolling stock :

- * maintenance and repair of coaches and diesel railcars
- * rehabilitation of coaches and diesel railcars
- * rehabilitation of diesel electric locomotives
- * personnel planning and management
- * fabrication process for passenger coaches
- * general workshop organization and layout

Infrastructure:

- * buildings, bridges and tunnels maintenance, conception, construction, diagnostics, restoration
- * track maintenance methodology, renewal, measuring and inspection, equipment maintenance planning and utilization
- * radio communication
- * time management for track maintenance works
- * personnel planning and management

Research and new technologies:

- * environmental studies
- * high speed train technology
- * computer aided maintenance management
- * laboratory conception
- * reclaiming components, used rails, permanent way fittings, scrap management

66. It is interesting to note that several former participants indicated as priorities also such areas, in which any application of the technology by the railway company concerned cannot be considered in the near future (high speed train technology); apparently the railway

companies or at least some of their staff consider it important to be kept apprised of the progress in the railway sector.

67. The civil engineering areas (design, maintenance and construction of buildings, bridges and tunnels) were marked as priority areas only by the civil engineering specialists who attended the workshops. Thus these areas should be considered as a domain of a rather narrow category of specialists.

Chapter 4

IMPLEMENTATION

Delineation of project management responsibilities

68. The division of responsibilities was understood identically by all parties concerned as regards the following steps:

preparation of project document	UNIDO
preparation of aide memoire	UNIDO
terms of reference for the country papers	UNIDO
selection of countries	SWISSRAIL
sending out invitations	UNIDO
selecting participants	UNIDO + SWISSRAIL
detailed workshop programme	SWISSRAIL
logistics of the workshop	SWISSRAIL
organizing and purchasing air tickets	UNIDO
paying (reduced) DSA to participants	UNIDO
conduct of the workshop	SWISSRAIL

There were no problems in the execution of the above steps caused by lack of understanding in the division of responsibilities, with the exception of informing the participants about the change of venue and the payment of DSA at the 1993 workshop.

69. However, there was a misunderstanding between UNIDO and SWISSRAIL as regards the preparation of the technical report (Output 1) on the methodology and modalities of the development of a national programme on rolling stock, R&D engineering services and technical manpower development. When asked by UNIDO to prepare this report SWISSRAIL was surprised at the request, having assumed that the evaluation report already prepared by Mr. de Moustier (HRD) was sufficient. SWISSRAIL prepared a new report, which is valuable as an evaluation report and very useful for all parties concerned with the preparation and implementation of the programme. However, this is not the type of report which is required by the project document and which is supposed to be distributed to the participants.

This is not to criticize the fact that the report was not prepared. In fact, in view of the abundant materials given to the participants during the workshop it might as well have been decided not to prepare any additional report/paper. This is only to demonstrate how little the content of the project document is used as the framework for the activities. One of the reasons may be that the practice of using a previous project document for the approval of a new workshop, without amending it, resulted in the irrelevance of many design components and thus in a loss of credibility for the document as a whole.

UNIDO backstopping

70. The programme was backstopped by the Engineering Branch. At the beginning of the programme the Non-Governmental Organizations Section was also involved in the implementation of the projects. There were several changes of backstopping officer in the course of the programme's implementation.

It was at the 1993 workshop that the HRD Branch became involved, shortly before the workshop started. A staff member from the HRD Branch attended the workshop, delivered a lecture on UNIDO activities in the railway sector and conducted an end-of-programme evaluation. In the early stages of the programme the UNIDO IPS office in Zurich made a presentation at the workshop.

71. Hardly any technical/professional UNIDO contribution in the form of lectures was recorded.

72. One of the consequences of this is that the workshops were perceived by some participants primarily as SWISSRAIL workshops. On the other hand some high level senior managers stated that they participated at the workshop or nominated a participant because UNIDO was involved in its organization. They preferred technical cooperation through the multilateral system and felt that joint UNIDO/SWISSRAIL programme provided an opportunity for reinforcement of international relations.

Implementation planning

73. Implementation was frequently affected by shortage of time. Apparently, the implementation plans were not realistic. Not enough lead time was provided for national counterparts to select and nominate candidates and for the selected participants (particularly those not based in the capital) to prepare for the workshop.

In two cases the workshops had to be postponed, once because of illness of the Project Director and once because of the low number of applicants (due to a very short time for the submission of applications).

74. The timing of the workshop was also important for the participants: April was appreciated, November was considered inconvenient (too cold).

Selection of countries

75. As a rule, the countries to be invited were selected by SWISSRAIL. UNIDO accepted the proposals as submitted by SWISSRAIL.

76. 15 to 20 countries were usually invited to submit candidates. As a rule each country was supposed to propose one or two candidates.

For the 1993 workshop the selection of countries was predetermined by the request of BAWI to conduct the workshop for francophone countries in Africa; almost all francophone countries with railway systems were put on the list by SWISSRAIL. As there were not enough applications it was agreed to also invite Romania.

Selection of participants

77. UNIDO applied the standard procedure in the identification and selection of participants: The relevant Ministries of invited countries are advised by UNIDO through the local UNDP Office about the offered workshop. The Ministries thereafter advise the UNDP Office (with standard nomination forms duly completed) of their prospective participants who in turn transmit their documents to UNIDO for final acceptance.

78. According to the Project Director the idea of SWISSRAIL to ask BAWI for support in contacting target railways in the developing countries and in assisting them in proper understanding of the selection requirements for participants "did not work". As invitations were sent out by UNIDO through UNDP offices, and SWISSRAIL was not informed of the status of applications, any intervention of BAWI was difficult to organize.

79. The selection of participants was affected by the fact that the number of applicants per workshop was lower than the target level (20). With 64 participants attending the four workshops the average was 16 participants per workshop. Thus, in percentage terms, there was a shortfall of 20% as regards the desired number of participants for each workshop. The average is, however, biased by a particularly low number of participants (12) at the 1989 workshop; the evaluation team did not succeed in tracing the reasons for such a low participation.

To some extent the lower number of participants can be explained by a low ceiling for the number of participants (one to two, exceptionally three) established for each invited country.

80. In view of the low number of applicants the selection process was very simple: every applicant was accepted. This situation did not allow UNIDO or SWISSRAIL to influence the composition of the group at this stage.

Of 64 participants, 77% were directly involved with the Railway Transport System with their areas of responsibility covering the fields of:

- Rolling Stock
- Track
- Telecommunications/Signalling
- Operations and Maintenance

Of the remainder, 78% were associated with the Railway Ministry with a background in civil and mechanical engineering, 17% with the Ministry of Planning as transport planners and 5% were financial controllers of the Railway Board, which again is under the Ministry of Railways.

In general, all participants had several years of experience with the Railway Transport System. Participants from more developed railway systems were mostly senior level officials and were more conversant with the subject in comparison to participants from less developed railway systems. Some participants felt that future workshops should ensure a more homogenous group of participants to facilitate effective discussions.

81. Emphasis on high-level decision makers from railway companies and transport ministries as the primary target group was an important component of the original concept of the programme. Particularly in the first workshops the share of senior staff from the ministries in the composition of the group was high. Gradually, however, the share of railway management staff increased. In the 1993 workshop the ministry staff represented one third of the participants. In a few cases, however, the ministry staff prevailed in the composition of the country "delegations".

82. While preference should be given to managerial staff from the railway companies, some participants felt that the participation of ministry staff might be useful so as to demonstrate to them how to minimize the difficulties of the railway companies and to stimulate support for the implementation of project proposals.

Administration and logistics

83. In general, the participants confirmed their satisfaction. Occasional critical comments were recorded as regards non-delivery of Aide-Memoires, payment of the daily allowance at the end of the workshop (in 1990) and inadequate assistance to participants on arrival.

Workshop implementation

84. Lecturers were selected from and provided by the SWISSRAIL members. SFR representatives lectured in technical and managerial fields and conducted visits to rolling stock and track maintenance workshops, signalling posts, construction sites, etc. Industrial companies presented and demonstrated technologies and products. The subjects were complemented by lectures of governmental organizations (Federal Office of Transport, Federal Office for Foreign Economic Affairs) and universities (Technical University/Federal Polytechnical School).

There was general satisfaction with the way the lectures were delivered, the visits conducted and the workshops managed. Clear instructions were provided to the participants on their daily schedule. There was no lack of communication and understanding between the participants and the organizers. Plant/company visits were useful particularly in view of the time provided for questions and answers. While travelling by train in Switzerland participants had the occasion to observe specific aspects of the Swiss railway (such as mountain trains dealing with short curves and high slopes) which were relevant for many participants.

85. The 1993 workshop was managed in a particularly professional way. Written instructions to the lecturers contained information about the structure, format and other presentation requirements. Supporting documentation was handed out to the participants only

after the lectures/presentations. Some time was allowed for questions and answer after each lecture. Some programme elements were optional (participants were given the choice to visit either a wagons or a locomotive workshop). Thanks to a tight time management the workshop was very intense.

86. SWISSRAIL was capable of providing additional information (paper on privatization and deregulation) in the case of a request.

87. Some participants felt that a few company presentations had focused on promotion of their products and technology, disregarding the human factor in the developing countries.

88. The intensity of the workshop programme did not allow for more discussion of the problems of individual countries and for assessment of the applicability of the demonstrated advanced management systems and technologies in the participants' countries. This was compounded by the poor quality of country papers which usually contained general information about the railway company rather than a description and analysis of specific problems that would stimulate an exchange of views.

The lack of possibilities for a structured and monitored discussion and interaction among participants was noted, particularly during the first three workshops at which a one way information flow prevailed. This can be considered as the most important deficiency of the workshops.

Programme contents of individual workshops and their perception by participants

89. In view of the fact that little workshop documentation is available about the 1987 workshop, the three remaining workshops are reviewed only.

1989 Programme

- SFR corporate planning, general presentation
- SFR operating, signalling
- Visit SLM electric locomotives, Oerlikon brakes laboratory (simulator), ABB electric locomotives, light rail traction
- SFR workshop for welding of long rails, recuperation of used rails, track renewal and maintenance equipment
- SFR maintenance workshop of passenger coaches, signalling and safety
- Technical University : traffic engineering
- Swissrail company presentations

In 1990 Programme the following subjects were added :

- Government and supervision of public transport
- SFR performance mandate, Rail 2000 program
- Matisa visit : track maintenance and rehabilitation equipment
- ACM Vevey visit and paper on meter gauge rolling stock (trains and streetcars)
- SFR District : paper on railway operating and operation control

- Zurich suburban planning
- ABB electric locomotives

90. The inputs of SFR were appreciated by all participants. It enabled them to compare the Swiss situation with theirs and to get acquainted with approaches applied by an advanced railway company. The most interesting elements were the relation between SFR and the government, the Swiss approach to corporate planning and affiliation. The documentation provided was found excellent and comprehensive, and in many cases is used as reference material.

91. The visits and lectures on signalling were found relevant especially in the field of safety. Technically, the Swiss signalling system is quiet specific and much more developed than the signalling systems used in the developing countries. However safety standards and regulations applied at SFR may be considered applicable to a certain extent.

The SLM lectures on electric locomotives and light railway could only be relevant for those participants whose networks apply or intend to apply electric traction, or those which combine railway transport with light railway transport. In any workshop the number of such participants did not represent more than 50 % of the total number of participants.

The visit to the Cerlikon brakes laboratory was relevant for all participants dealing with rolling stock maintenance.

The technique of welding of long rails and recuperation of old rails as shown at the SFR Haegendorf workshop was relevant for those few developing countries who apply or intend to apply the technology. It was particularly appreciated by Indian participants.

Maintenance of track maintenance and renewal equipment was relevant for all participants.

The maintenance techniques for passenger coaches were only relevant in the domain of structural repair.

The visit to Matisa was relevant for participants with a background in track maintenance, and was interesting for most of the others.

As regards the presentation by ACM Vevey, there were no specific comments by the interviewees except for a Tunisian participant who became interested in studying the possibility of using bogies for both standard and metric gauges.

The lecture on suburban traffic planning was only relevant for the few participants who, besides railways, also deal with urban transport (such as the Turkish Railways).

92. 1993 Programme

- UNIDO presentation on human resources development and experience in railway training programmes
- Presentation of SWISSRAIL

- Presentation of participating countries networks
- Operations planning (Zurich Polytechnical School)
- SFR presentation on organization, performance, training, infrastructure maintenance
- SLM presentation on bogies and electric tractive stock
- ABB presentation on electric traction and passenger coaches
- Von Roll Isola presentation on maintenance and repair of traction engines
- Nencki presentation on workshop and track maintenance equipment
- SFR: choice of visit of either a wagons or locomotive (diesel + electric) maintenance center
- Matisa visit : track maintenance and rehabilitation equipment
- OFT (Federal Transport Office) on network inspection
- "l'Heure Exacte ..." demonstration by Moser-Baer on installation and use of clocks in railway premises
- Secheron Hasler presentation on speed indication and registration devices
- Furrer + Frey presentation on construction of catenaries
- Gardy presentation on electric components
- Silcosil presentation on isolators for overhead lines
- EBO presentation on cable housing devices
- Lecture on Swiss government cooperation with developing countries.

93. The UNIDO presentation was useful because it enabled participants to understand the roles of all parties concerned.

The lecture on operations planning was a well structured lecture that dealt with both operational (running time calculation) and managerial (transport offer efficiency increase) aspects. The lecture was relevant. However, for smaller railway networks dealing with structural maintenance problems (bad conditions of track/rolling stock) the subject is not a priority.

The SFR lectures were further extended to cover training and infrastructure maintenance. All SFR inputs were very relevant.

The SLM presentation was in fact a product presentation accompanied with documentation inadequate for the workshop.

The ABB presentation focused on the latest evolutions in the field of passenger coaches equipment and electric traction. Documentation for the 1993 workshop was appropriate. The presentation was appreciated (interesting for all railway men) but because of the high-tech displayed was not of direct applicability for all the railways companies.

Von Roll Isola manufactures spare parts for diesel electric generators. The presentation should have been relevant for participants in the field of maintenance of diesel electric locomotives. The documentation handed out was of good quality. Surprisingly, some participants when asked did not remember much about the presentation.

Nencki is a manufacturer of workshop and track maintenance equipment. The lecture was relevant and the documentation appropriate.

The lecture of OFT on network inspection and its documentation was found relevant and interesting by all interviewed participants. It was a discovery for most participants. The fact that an independent organization is responsible for inspection of all means of public transport was new to many of them.

The presentation by Moser-Baer was an attempt to introduce very high standard of clockwork precision into developing country railway networks. Although some participants interviewed found the presentation interesting, several participants found the presentation irrelevant and the documentation provided rather inadequate.

Secheron Hasler manufactures electronic speed indicators and registration devices for tractive stock. This was relevant not only for rolling stock specialists, but also for track maintenance specialists (line calculation of speed and tonnage).

The presentations by Furrer + Frey, Gardy and Silcosil were all in the field of electric traction and thus irrelevant for at least half of the group of participants who do not have electric traction in their network.

EBO manufactures cable housing systems for installation along railway lines. The presentation was found relevant but the high price makes the application of these systems in developing countries difficult.

94. To sum up, the choice of subjects selected for the workshops was satisfactory, and the classification of subjects into five chapters (network organization, rolling stock techniques and maintenance, safety and information, infrastructure maintenance and rehabilitation, development and financing) was logical. The inputs of SFR and OFT were very relevant. In the field of rolling stock the lectures and presentations by Von Roll Isola and Nencki and Secheron Hasler were particularly relevant.

Of limited relevance were the lectures in the field of infrastructure maintenance and rehabilitation for the francophone African countries. They dealt mainly with electric traction and expensive line equipment. Doubts can be expressed also about the relevance of the presentation by Moser-Baer.

Workshop evaluation

95. Evaluation of the 1990 workshop based on questionnaires filled in by the participants at the end of the workshop was done by SWISSRAIL (in a rather brief form). Some participants complained that the completed questionnaires were not discussed in the group. The evaluation exercise at the 1993 workshop was conducted by the UNIDO staff member from the HRD Branch who attended the whole workshop. This evaluation is detailed and includes several proposals for improvement of the programme. As explained above, SWISSRAIL prepared an additional evaluation of the 1993 workshop with well substantiated proposals for the future. Both reports were considered by this in-depth evaluation.

96. No follow-up activity to inquire about the effectiveness of the programme was conducted. As apparent from the Appraisal Memorandum issued by the then Programme and Project Appraisal Section on 25.1.1993, "an ex-post follow-up element...to determine an

overall impact of the project some 6 months/one year after the completion" was recommended for inclusion in the project.

Project costs and their structure

97. Originally it was assumed that the costs would be shared (50:50) between UNIDO and SWISSRAIL. The very first workshop (1987) actually shows a low level of expenditure covered by UNIDO. From 1989 on all workshops have been financed primarily by UNIDO from the Swiss contribution to the IDF.

Project budget costs and actual expenditures for all four workshops are described in Table 3.

Expenditures were in all cases well below the original budget costs. Savings were achieved partly due to a lower number of participants than planned, but deliberate steps were also taken by project management to keep expenditures low (arrangements with hotels for reduced price of accommodation - approx. SFr 150 per day including meals). Conducting the workshop at the SFR training centre at Loewenberg was not considered feasible because of its remote location.

98. All specific indicators of costs/expenditures per trainee improved during the last three workshops. One of the reasons was the low number of participants at the 1989 workshop.

99. The training costs represented the largest component of the budget and expenditures. Training expenditures per trainee maintained the same level for the last three workshops.

100. Within the training expenditures the most significant cost item was travel. Travel costs were budgeted on the basis of business class air tickets minus 25% which was supposed to be paid by the participant's organization. According to UNIDO Administrative Instruction UNIDO/ADM/FS.10 dated 28 February 1984 the fare entitlement of a participant is a round-trip air economy transportation. The above arrangement made it relatively easy for the participants' organizations to comply with this cost-sharing requirement by using the economy class ticket.

101. Most of the interviewees acceded that some cost sharing by railway companies might be considered. However, the budgeting system of railway companies may not allow for fast settlement of the request.

102. Specific costs (costs per participant-day) compared well with the specific costs of workshops of similar type and duration (see Table 4). Owing to the high fixed (travel) costs, any extension of the workshop duration would result in lower specific costs/expenditures.

103. Actual total costs were, however, considerably higher than actual expenditures debited to the project budget because of the high inputs of SWISSRAIL in kind and because of extensive administrative work on the part of both SWISSRAIL and UNIDO. The SWISSRAIL contribution in kind was significant. All lectures and presentations by representatives of SWISSRAIL members were free of charge, the accommodation costs of

Table 3:

Project Budgets and Expenditures

Workshop (Year)	1987	1989	1990	1993
Project Document	US/INT/87/124	US/GLO/88/234	US/GLO/89/218	US/RAF/93/012
Budget - total	28,488	70,100	104,376	98,000
Expenditures - total	28,488	45,750	70,723	65,841
of which				
- Personnel	854	1,551	869	1,870
- Training	27,634	44,199	67,549	63,970
- Miscellaneous	-	-	2,305	-
Number of Participants	15	12	19	18
Budget Cost per Participant	1,899	5,841	5,493	5,444
Expenditures per Participant	1,899	3,812	3,722	3,657
Training per Participant	1,842	3,683	3,555	3,554

Table 4:

Comparison of specific costs

Venue	Days	Participants	Budget	S/Participant	S/Participant - Day
SWISSRAIL¹	5	16	60770²	3800³	760⁴
India (92)	5	11	50000	4545	900
China (92)	6	14	103000	7373	1230
UK (92)	5	7	35000	5000	1000
Japan (94)	21	7	111000	15857	755

¹Average for 1989-93

²Actual expenditures

³Budget-derived indicator (20 participants):4541 \$/participant

⁴Budget-derived indicator (20 participants): 908 \$/participant - day

SWISSRAIL representatives (if required) were also borne by the SWISSRAIL companies, and the preparatory and follow-up work of the SWISSRAIL General Manager and his secretary were covered only partly by the project budget. In the latest project document the contribution in kind by SWISSRAIL was estimated at \$ 70000.

Actual support costs of UNIDO exceeded by far the 13% support cost reimbursement.

High specific support costs resulted from the nature of the project itself (administering a large number of participants). This high labour intensity was added to by the large number of countries invited to submit candidates, which required extensive communication with field offices.

104. An alternative of holding a regional workshop in a developing country would reduce the travel costs, but would considerably constrain the possibility of demonstrating management systems and technology.

Chapter 5

RESULTS

105. The results should be assessed at three levels:

- production of outputs
- use of the outputs (achievement of the project objective/purpose)
- impact (of the use of the outputs).

Production of the Outputs

106. As described in Chapter 3, the structure of project objectives and outputs was maintained without any significant change in all three available project documents (project document for the first - 1987 - workshop is not traceable). The following Outputs were to be produced according to the project document for the 1993 workshop:

- (i) *A technical report on the methodology and modalities of the development of national level programme on rolling stock, R&D engineering services and technical manpower development, including an outline of an interregional training programme project for interested developing countries.*
- (ii) *Based on the individual country papers prepared by the participants before the workshop, elaboration of national level project proposals with each of the participants from the developing countries on the individual technical assistance requirements for strengthening the "national engineering service and training" for submission to his/her government for implementation under UNDP/IPF finances or through other sources of finances.*
- (iii) *Tentative agreements for industrial cooperation activities between SWISSRAIL members and the participating developing countries.*

Assessment of the production of Outputs as defined above is negative: none of the Outputs was produced. The technical reports were not prepared at the end of the workshop, no proposal for technical cooperation was elaborated, no tentative agreement for industrial cooperation with SWISSRAIL members was prepared in the course of the workshops. The participants were even not aware that they were expected to prepare project proposals for strengthening the "national engineering service and training", as assumed under Output (ii). This, however, reflects to a great extent design deficiencies (as explained in Chapter 3) rather than the effectiveness of the programme.

On the basis of the analysis of the project documents it was proposed that the Outputs be formulated as follows:

- 1) *Up to 20 high level railway engineers, technicians and managers from developing countries provided with information on and demonstration of the latest techniques in management, safety, repair and maintenance, spare parts production and the manufacture of railway equipment*
- 2) *Country-specific assessments of problems and needs in the above defined areas (as described in the country papers) as well as of the applicability of the new techniques in the participants' countries and the possibilities for introducing them.*
- 3) *A consolidated set of reference material reflecting the main topics presented at the workshop*

107. With this reformulation Output 1 was produced in all projects (perhaps with the qualification that less than 20 participants attended the workshops). The volume of information provided at the 1993 workshop was particularly extensive. High quality of workshop implementation contributed to the fact that much of the information provided and of the advanced management systems and technology demonstrated was retained and converted into increased knowledge of the participants. The participants highlighted the exposure they had been given to usage of modern technology in the railway transport system. The following specific areas were highlighted by participants in the interviews with regard to knowledge and information acquired:

India

- Management techniques at SFR (inter-departmental coordination)
- Reclaiming useful components from old assets
- Reclaiming released rails and permanent way fitting for subsequent use
- Reduced manpower in manufacturing operations and operational duties
- Scrap management
- Fabrication process in coach workshop
- Railwelding technology
- Low inventory management
- Allocation of more time for the working of track machines

Indonesia

- traffic control
- rehabilitation of track, rail repair
- locomotive technology (geared locomotive)
- computerized monitoring system
- arrangements for advertisements
- train supervision through TV

Romania

- SFR management

- SFR financing structure
- organization of the repair of rolling stock workshop
- usage of modern speed meter with electronic registration
- track maintenance

Tunisia

- OFT Inspection
- time table design for passenger and freight service
- running time calculation by computer
- privatization, corporate planning, cost benefit calculations
- tilting bogies
- cable housing
- workshop equipment
- speed indicators and registration
- position of management in a workshop
- engine test bench, bogie repair techniques

Turkey

- tilting bogies (curves with small diameters in Turkey!)
- understanding the signalling programme
- SFR management
- new prototypes of a locomotive
- brakes laboratory for train sets

Some of the responses received by mail also contained indications of what seems to have been retained by the participants. They refer to some of the areas quoted above.

108. Output 2 was produced to a limited extent only. A portion of the workshop was devoted to the presentation of country papers and discussion of the country problems at the 1993 workshop but the time was too short, the country papers rather general (mostly presentations of the railway companies) and the group rather heterogenous so that this activity was not very effective. Assessment of the applicability of the demonstrated technology and management systems was rather a matter of each participant's judgement and individual interaction than of a structured and organized interaction in the group.

Inadequacy of professional interaction among participants manifests itself indirectly in the fact that, with one exception, no contacts among former participants have been kept after the workshops.

109. Output 3 was produced fully. The sets of documentation provided to the participants and consisting of texts of lectures, descriptions of company technologies and products and other supporting information were of good quality. Particularly comprehensive and extensive was the documentation handed out at the 1993 workshop. Of excellent quality was the documentation supporting the SFR lectures. However, in a few

cases no specific documentation was prepared for lectures/demonstrations and thus the supporting documentation was confined to company promotional literature.

Achievement of the Project (Immediate) Objective (Purpose)

110. Project objectives in the project documents read as follows:

- (i) *To provide up to 20 high level railway engineers, technicians and managers from developing countries with information on and demonstration of the latest techniques in management, safety, repair and maintenance, spare parts production and the manufacture of railway equipment; and*
- (ii) *To provide the opportunity to review and discuss these techniques, their applicability in the participants' countries and the possibilities for introducing them.*

111. The objective (i) was achieved, the objective (ii) was achieved to a limited extent only. However, as analyzed in Chapter 3, these objectives can be considered as Outputs (as formulated they can be produced by the project management), whereas the project objective should reflect the use of the outputs by the beneficiaries/workshop participants. The following project objective with indicators was proposed:

To initiate and or facilitate the introduction of managerial and technological improvements in railways companies and or railways-related industrial enterprises in selected developing countries in the areas of safety, repair and maintenance, spare parts production and the manufacture of railway equipment.

Indicators:

Management decisions about the analysis of proposals (made by workshop participants) for specific technological or managerial improvements

Management decisions about introduction of specific technological or managerial improvements proposed by the workshop participants

Arrangements for industrial cooperation between railway company/industrial enterprises in the developing country and SWISSRAIL members

Proposals for technical cooperation with UNIDO

112. Neither UNIDO nor SWISSRAIL had any information about the use of the project outputs by the participants. However, the evaluation mission found some evidence of the use of the project outputs in the field. The interviews with the former participants and also some of the mail responses revealed that the documentation was still often used by the former participants. In some of the countries under review the outputs were used by the participants to initiate technological or managerial changes and improvements. Some of

these proposals are still under consideration by the top management, some are being verified on a pilot basis, a few of them were implemented. In some cases the acquired new information supported the preparation of technical specifications for tenders, their evaluation, or the introduction of new technology which had been decided upon independently of the participation of the country at the workshop. Established industrial cooperation contacts with SWISSRAIL members were also recorded.

The following examples can be given:

India

9. With regard to specific application of the newly acquired knowledge, the following areas of application were mentioned:

- Reclamation of components
- Scrap management, and
- Low inventory management.

The participants confirmed that above applications were being practiced and positive results had been achieved especially with regard to reclamation of components. It was further recommended that "clubbing of machines" be applied in mechanized track maintenance and the system was applied at one busy section. Templating and match-marking techniques for imparting correct geometry to the points and crossing layouts were adopted at several workshops of Indian Railways.

Furthermore, other new knowledge/information and ideas which emerged from the workshop were documented and presented to relevant Railway authorities. Management systems and methods of SFR (especially in regard to inter-departmental coordination) were brought to the attention of the relevant Committee established by Indian Railways to introduce massive managerial changes. The participants opined that given the size and magnitude of Indian Railways, the proposed changes and their introduction, however, would be slow and gradual.

Indonesia

113. The workshop documentation was used as reference material for writing papers. A concrete application of the knowledge acquired at the workshop was reported on

- (i) locomotive technology applied in West Sumatra and
- (ii) computerized monitoring system in Bandung.

However, with regard to locomotive technology some reservations were expressed on the extent to which it could be attributed as a direct consequence of the SWISSRAIL workshop. Construction of the terminal for locomotives with assistance from Switzerland and delivery of SLM locomotives were initiated before the workshop. However, the visit to the SLM factory and the information provided during the workshop facilitated the role of the participant in implementation of the contract.

Romania

114. The workshop documentation is often used, copies of SFR presentations were sent to all regional directorates. A one-day visit of the Yverdon workshop was organized for 10 management and technical staff. Direct contact was established with Secheron-Hassler in order to introduce the electronic speed meter in the railway company; the speed meter is currently tested on one locomotive. Contacts between Secheron-Hassler and a local manufacturer of locomotives (at Craiova) were initiated, aiming at a joint project to upgrade manufacturing of electrical sub-assemblies of locomotives. A visit to Matisa made it possible to get acquainted with track maintenance and renewal equipment; this knowledge was applied in the evaluation of tenders under a World Bank loan. (Eventually, Matisa did not win the offer.)

Another direct application of the workshop outputs was the evaluation of track maintenance costs and traffic interruption costs for track maintenance at the railway company. The documentation provided by SFR was used as a model for cost calculation and as a tool for convincing the top management of the railway company. Yet another application was that the railway company started to elaborate joint time tables for track work needs and transport needs (in collaboration with the transport department). In a certain way this improved collaboration between the track department and the transport department. The above measures lead to changes in some company regulations, such as regulations for drafting time tables for night (mainly freight) traffic and regulations for local alternative routing in case of track maintenance works.

Awareness of the increased costs of night work (due to 30 per cent lower labour productivity) affected the planning of the maintenance work.

Tunisia

115. Recommendations were made by the participant (based on SFR lectures) in the field of track maintenance strategy and maintenance training for introduction at SNCFT. Although these recommendations have not yet been followed up, it is expected that they will be implemented in due time.

The knowledge gained from the session on speed indicators and registration (Secheron-Hasler) was transferred by the participant to the Rolling Stock Department to include such devices when purchasing new tractive stock. In this regard one participant is working in close collaboration with the Rolling Stock Department for track upgrading for new tractive stock.

One participant proposed collaboration with ACM Vevey for studying the possibility of using multi-gauge bogies but due to changes inside SNCFT management the project was cancelled.

Turkey

116. Information and acquaintance with the braking simulations (visit of a brakes laboratory at Oerlikon) facilitated the preparation of technical specifications for a tender for a train drive simulator and its evaluation. A study on implementation of tilted bogies

was ordered. The newly acquired knowledge also facilitated the implementation of the signalling programme.

Mail replies

117. Several applications of the newly acquired information and knowledge were reported in the mail replies: changing form manual to computer ticketing system (Malaysia); strengthening the demand component in transport planning (Cameroon); management techniques (Algeria); workshop arrangement, rehabilitation of fittings (Jordan).

Impact

118. Impact of the use of the results could not be quantified in measurable terms. Some savings resulting from the introduction of some measures mentioned above could be assumed but it was not realistic to make any reliable quantitative assessment. In fact some participants stressed that lack of capability on their part to quantify the benefits of introducing new technologies, management systems and working practices turned out to be a handicap in convincing the management to make decisions about the application of innovations. In view of this fact they asked that economic assessment of investment and rehabilitation proposals be included as a topic in the workshop programme.

Nevertheless, it is presumed that the use of the outputs described above (in particular of the information acquired at the workshop) brought about some economic and other (social, environmental) benefits in very different, though not easily discernible forms.

Chapter 6

CONCLUSIONS

Relevance

119. Project objectives (Purpose) as defined in the project documents do not reflect the actual purpose of the workshops; as the project management is fully responsible for their "production", they can be reformulated as Outputs. The Purpose of the project and related indicators can be formulated as follows:

To initiate and/or facilitate the introduction of managerial and technological improvements in railways companies and/or railways-related industrial enterprises in selected developing countries in the areas of safety, repair and maintenance, spare parts production and the manufacture of railway equipment.

Indicators:

Management decisions about the analysis of proposals (made by workshop participants) for specific technological or managerial improvements

Management decisions about introduction of specific technological or managerial improvements proposed by the workshop participants

Arrangements for industrial cooperation between railway company/industrial enterprises in the developing country and SWISSRAIL members

Proposals for technical cooperation with UNIDO

The outputs of the project also require reformulation to restore the internal logic of the project.

120. In spite of the fact that no systematic detailed needs analysis had been carried out before the programme was started or before each individual workshop was prepared, the programme as a whole was perceived by most of the participants as relevant for their railway companies. This perception is understandable and well substantiated. Discussions with the former participants and some of their colleagues about the training and awareness raising needs of the railway companies revealed that these needs are so diverse and extensive that any awareness raising workshop or group training programme prepared for a well defined target group would match an existing demand for training/awareness raising from railway companies and/or manufacturers of railway equipment/spare parts.

121. However, the programme contents were too broad to ensure the relevance of each programme component for each participant. For example the lectures/demonstrations on electrical traction in the 1993 workshop were not relevant for the participants from those developing countries which only operate diesel traction. Better definition of the target

group and a focus on selected issues would have further increased the relevance of the workshop.

122. The Swiss technology demonstrated at the workshop represents indeed the highest level of technology development and application in many areas of the railway sector, such as electric tractive stock, track maintenance and renewal equipment, speed indication and registration and workshop equipment. For many developing countries this technological level may not be attainable in the near future. However, some participants stressed that - in spite of the gap between the technology applied by their railway companies and that demonstrated at the workshop - the technology demonstrations had the value of setting reference standards which might help the railway companies in, for example, formulating technical specifications for tenders and evaluating these. Nevertheless, it must be acknowledged that - in general - the closer the gap between the technologies, the more relevant the demonstrations of the advanced technologies for the developing country.

123. The forward-looking assessment of the training and awareness raising needs in the visited countries indicated that in some areas the needs are particularly compelling. While some areas were considered as priority areas only by some participants [railways], the area of general management of railways companies, and in particular the economic evaluation of technological, operational and organizational changes, were considered of utmost importance by most participants. The countries in transition seem to be faced with specific problems of an unprecedented drop in freight, which underlines the importance of marketing of the railway services, restructuring and privatization.

124. Amongst other agencies supporting the railway companies in the area of human resource development the most frequently quoted was the World Bank, usually in connection with loans to rehabilitate railways. However, the training element of World Bank projects is usually targetted at large segments of the labour force and management with strong institution- building components. Thus the type and scope of external support from the World Bank for a national programme is very different from awareness raising workshops such as the one under evaluation.

Efficiency

125. The delineation of responsibilities between UNIDO and SWISSRAIL was well established for most of the preparatory, implementation and evaluation steps, although some confusion occurred (in 1993) in case of the payment of the daily subsistence allowances to the participants.

126. The following shortcomings in the project documentation affected the implementation of the project:

- some parts of the Terms of Reference for the preparation of the country papers were not coherent with the outline of the issues to be addressed by the workshop and some parts of the text were even difficult to comprehend so that they could hardly contribute to the preparation of the country papers as desired;

- the Aide-Memoires did not contain detailed contents of the workshop;
- not enough lead time was provided for the selection of the participants and their preparation for the workshop so that the country papers were received too late to be considered in the preparation of the workshop programme.

127. In the preparatory phase problems with timely responses on the part of UNIDO and field offices were recorded; this aggravated further the time pressure under which the workshop was prepared.

128. As the number of candidates was lower than the target number (20), all applicants were selected. This did not allow UNIDO/SWISSRAIL to influence at this stage the composition of the attending group.

129. The heterogeneity of the participants was compounded by the heterogeneity of the participating countries/railway companies. This factor also contributed to a rather limited interaction among the participants as recorded by the evaluation mission. In fact hardly any contacts among participants after the workshop could be identified (except for one case).

130. The delivery of lectures, company presentations and technology demonstrations were conducted in a very satisfactory way; technology demonstrations were considered by the participants as a very useful form of exposure to technology development.

131. Most of the handouts and other textual and graphical documentation was well organized and presented; the supporting documentation of the SFR was excellent and highly appreciated by the participants. In a few cases the supporting documentation was confined to company promotional literature.

132. However, the duration of the workshop was too short to deal with all the topics in sufficient detail. For the same reason there was inadequate discussion of the participants' problems and needs and of the applicability of the presented management systems and technology in their countries.

133. SWISSRAIL management of the workshop was very professional; this applies in particular to the 1993 workshop which was distinguished by the high intensity of the workshop programme.

134. UNIDO contributions during the workshops themselves were rather marginal except for the 1993 workshop which was attended by a UNIDO staff member (HRD Branch) who presented UNIDO training and other activities in the railway sector and conducted the "end-of-programme evaluation" of the workshop. This, however, can not be considered as a substantive contribution.

135. Expenditures were in all cases well below the original budget costs; the savings were achieved partly due to a lower number of participants than planned, but deliberate steps were also taken by project management to keep expenditures low.

136. The most significant cost item was travel. Travel costs were budgeted on the basis of business class air tickets minus 25% which was supposed to be paid by the participant's organization. This arrangement made it relatively easy for the participants' organizations to comply with this cost-sharing requirement by using the economy class ticket.

137. Specific expenditures (expenditures per participant-day) compare well with specific expenditures of workshops of similar duration. Owing to the high fixed (travel) costs, any extension of the workshop duration would result in lower specific costs/expenditures.

138. Actual total costs were, however, considerably higher than actual expenditures debited to the project budget because of the high inputs of SWISSRAIL in kind and because of extensive administrative work on the part of both SWISSRAIL and UNIDO. The value of inputs of SWISSRAIL in kind was estimated in the last project document at approximately \$70000, the actual support costs of UNIDO exceeded by far the 13% overhead costs.

139. High specific support costs resulted from the nature of the project itself (administering a large number of participants); this high labour intensity was further augmented by the large number of countries invited to submit candidates, which required extensive communication with field offices.

Effectiveness (production of Outputs and their use to achieve the Purpose)

140. Assessment of the production of Outputs as defined in the current project documents is negative: none of the Outputs (a technical report including an outline of an interregional training programme: project proposals for strengthening the "national engineering services and training" elaborated with each participant; tentative agreements for cooperation with SWISSRAIL members) was produced. However, this reflects the design deficiencies rather than the effectiveness of the programme. On the basis of the analysis of the project documents it was proposed that the Outputs be formulated as follows:

- 1) *Up to 20 high level railway engineers, technicians and managers from developing countries provided with information on and demonstration of the latest techniques in management, safety, repair and maintenance, spare parts production and the manufacture of railway equipment*
- 2) *Country-specific assessments of problems and needs in the areas defined above (as described in the country papers) as well as of the applicability of the new technologies and techniques demonstrated at the workshop in the participants' countries and the possibilities of introducing these techniques and technologies.*
- 3) *A consolidated set of reference material reflecting the main topics presented at the workshop*

141. Out of the 3 newly formulated outputs the Outputs 1 and 3 were produced fully (perhaps with the qualification that less than 20 participants attended the workshops). Output 2 was produced only partly: country papers were not submitted by all participants and the quality of some country papers was rather low. The time available to discuss the country papers, the country problems and needs and the applicability of the demonstrated technologies was rather short.

142. Neither UNIDO nor SWISSRAIL had any information about the use of the project outputs in the field. The evaluation mission was pleased to find more evidence of the use of the project results in the field than expected. The documentation was used frequently by the former participants. In some of the countries under review the outputs were used by the participants to initiate technological or managerial changes and improvements; some of these proposals are still under consideration by top management, some are being verified on a pilot basis, and a few have been implemented. In some cases the acquired new information supported the preparation of technical specifications for tenders and their evaluation, or the introduction of new technology which had been decided upon independently of the participation of the country at the workshop. Established cooperation contacts with SWISSRAIL members were also recorded. Thus there is evidence that, considering the scope and duration of each workshop, the purpose of the project, defined retroactively, could be considered as achieved to an acceptable degree.

Impact

143. Impact in measurable terms could not be identified by the evaluation mission. Some savings resulting from the introduction of some measures could be assumed but it was not realistic to make any reliable quantitative assessment. It is, however, presumed that the use of the outputs described above (in particular of the information acquired at the workshop) brought about economic and other (social, environmental) benefits in very different, though not easily discernible forms.

Chapter 7

RECOMMENDATIONS

Workshop Contents and Methodology

144. The diversity of the contents of the workshop programme should be reduced so that each topic can be addressed in a more profound way and more time be made available for discussion of the countries' problems, assessment of the applicability of the new techniques and technology and for interaction among participants. The technical issues should be clustered in the following fields:

- * rolling stock;
- * infrastructure;
- * operations.

Each workshop should focus on one technical field only.

The general management issues should be maintained as a common component in all workshops.

145. The general management issues should include the topics presented at the previous workshops and some of the new issues, the importance of which was highlighted by the railway staff.

The following subjects were presented at the previous workshops:

Swiss Federal Railways:

- * general organization and performance
- * personnel training
- * corporate planning
- * privatization, deregulation, harmonization

Federal Transport Office:

- * network inspection

Optional subjects recommended for inclusion in future workshops are as follows:

- * financial management including economic and financial evaluation.
- * marketing and sales strategy
- * data processing (needs analysis, MIS)
- * materials management (purchase, stock management, Quality Assurance & Control)
- * combined (intermodal) transport: environmental studies, investment studies, coordination management between transport modes and other networks
- * safety regulations

146. A workshop in the field of *rolling stock* should include the general management issues as described above, and technical subjects related to rolling stock. The following rolling stock issues that were included in the previous workshops should be maintained:

- * demonstration of new technologies in the field of bogies
- * demonstrations of workshop equipment
- * visits to workshops for maintenance of tractive stock, freight wagons, passenger coaches (for structural repairs).
- * visit to the Oerlikon brakes laboratory

Optional subjects recommended for inclusion in future workshops are as follows:

- * workshop organization, layout, staff management and training, financial management
- * spare part manufacturing techniques
- * subcontracting policy
- * intermodal transport: freight wagon reconversion studies and implementation, technical description of specialized freight wagons (such as temperature controlled wagons)

147. A workshop in the field of *infrastructure* should contain the general management issues described above and technical issues related to infrastructure. The following infrastructure issues that were included in the previous workshops should be maintained:

- * visit / demonstration of track maintenance and renewal equipment
- * lecture on infrastructure maintenance management, track maintenance strategy, maintenance training

Optional subjects recommended for inclusion in future workshops are as follows:

- * telecommunications (train radio, optical fibre)
- * track inspection and measurement
- * buildings, bridges and tunnels maintenance, conception, construction, diagnostics, restoration
- * time management for maintenance work
- * signalling conception and technology, security regulations conception
- * reclaiming used rails and fittings
- * high speed track technology
- * computer aided maintenance management

148. A workshop in the field of *operations* should contain the general management issues as described above and technical and managerial issues related to railway operations.

Optional subjects recommended for inclusion in future workshops are as follows:

- * combined (intermodal transport): environmental studies, investment studies, coordination management between transport modes and other networks
- * running time calculation
- * time table simulation

- * crew management
- * rolling stock tracking
- * marshalling yard operations and management
- * line dispatching

149. When selecting a field for the workshop it should be recognized that the "Operations" field is the least relevant from the point of view of UNIDO's industrial mandate and competence.

The selection of subjects (from the above lists) within each field should be based on the availability of SWISSRAIL and UNIDO expertise and, to the extent possible, on the interest of the target countries. The interests of the target countries should be clarified before a detailed workshop programme is finalized. (See also paragraph 159.)

The UNIDO contribution to the workshop programme should be increased; demonstration of the COMFAR software as a tool to support investment/rehabilitation decision-making should be considered.

150. As far as possible, company lectures/demonstrations, while centered on the company's technology, should also provide general information about current trends in technology development. The supporting documentation should not be confined to company promotional literature.

151. More time should be allotted for interaction among the participants and for discussion of the possibilities and constraints in applying the newly acquired information and knowledge. This should help motivate the participants to apply the newly acquired information and knowledge after they return home.

Duration of the Workshop and Cost Sharing

152. The duration of the workshop should be extended. During the first part (lasting one week) the existing formula (with modified contents as proposed above) should be maintained but confined to lectures, demonstrations and a few visits of common interest (primarily railways facilities). The second part (3 to 5 days) should be dedicated to individual or group visits to companies and/or institutions in order to meet individual wishes to study in-depth the most urgent specific problems that each participant described in his/her country paper or indicated during the first week of the workshop.

153. In order to keep costs low and to increase the share of participants and their companies in covering the costs, it is proposed that the cost of the second part of the workshop be borne partly by the participant's company and partly by the Swissrail member company in charge of that particular element of the programme.

Participants Profile

154. The workshops should be targeted primarily at top and middle level managers of the railway companies responsible for the types of work covered under the content of the workshop. Railway companies should consider and propose invitations to the workshops for related ministries and/or industrial enterprises manufacturing or repairing equipment, components and spare parts for the railway companies. Procurement managers with technical background should be among the target group as well.

Target Countries and their Number

155. In view of the importance given to demonstrations of advanced technologies and management systems the workshop should be targeted at countries with larger and more developed railway systems.

156. Preference should be given to countries which plan or implement rehabilitation of their railway systems. Financial support of the programme by a World Bank or other loan could further enhance the effectiveness and impact of a country's participation at the workshop.

157. In order to increase the homogeneity of participants and to reduce the administrative work involved in the organization of such a workshop it is recommended that the number of invited countries per workshop be reduced to 5 - 7, preferably from the same region. The number of participants from each country should be increased. For this, a longer term plan of countries to be invited should be elaborated by UNIDO and SWISSRAIL in order to provide the possibility of attendance to a larger number of railway networks.

Project Documentation

158. The project document used for the previous workshops should be redrafted as proposed in Chapter 3. It should in particular re-define the Outputs, the "production" of which is the responsibility of project management (UNIDO and SWISSRAIL), and the Purpose (Immediate Objective).

159. The Aide-Memoire should become more user-friendly, describing both what participants can expect from the workshop and what UNIDO/SWISSRAIL expects from the participants. It should contain a detailed description of the workshop programme, including the list of companies which are ready to cooperate in the second part of the workshop.

Ideally, the Aide-Memoire should offer the participants the possibility of influencing the final contents of the workshop programme and/or the detailed planning of time allocation.

Terms of Reference for the country papers should be related to the specific issues of the workshop programme and contain clear instructions about the contents, structure, length and date of submission.

Project Implementation

160. The railway companies need more time to study the Aide-Memoire, select and submit candidates and prepare country papers. More lead time should, therefore, be included in the implementation plan.
161. The country papers should be distributed among the participants at the beginning of the workshop; each paper should be discussed at the workshop.
162. UNIDO and SWISSRAIL should monitor and promote interactions among and with participants in order to motivate them to develop actions for the future.

Follow up

163. UNIDO should make more effort in maintaining contacts with former participants and, through them, with the railway companies in order to monitor the impact of the workshop programmes it conducted and keep them informed about the training, information, advisory and other related services UNIDO can offer.

Coordination of UNIDO Programmes in the Railway Sector

164. This workshop should be interrelated with the other railway training/awareness raising programmes conducted by UNIDO. The Swissrail workshop is unique in the way that it enables participants to get acquainted with high technology and the latest developments in different railway subjects that are mastered by Swissrail members. Other UNIDO training projects on railway systems have used a different approach; they have rather intended to provide an applied competence in some specific fields of expertise.
165. If UNIDO includes development cooperation with the railway sector among its areas of concentration, then its professional competence should be strengthened. Backstopping function should be consolidated, close coordination of all training and awareness raising activities introduced and collaboration among all host training organizations enhanced.

An Alternative Concept of the Workshop

166. Optionally, this workshop could be conducted as a second (complementary) part of a larger training project, with the first part carried out by a regional training institute. In Africa, for example, the Union of African Railways - UAR - is coordinating the training activities for African railways in four regional training institutes. A cooperation agreement between UNIDO, UAR, the regional training institute(s) and the host training organization (HTO) in Switzerland would be required along the following lines:

- UAR/regional training institutes are responsible for the specification of the training needs, training contents and selection of participants

- UNIDO, the regional training institute and the HTO in Switzerland agree on how to best support the training at the regional training institute in the form of
 - lectures by UNIDO/Swiss HTO at the regional training institute, if required
 - complementary training/awareness raising at the Swiss HTO, consisting primarily of practical demonstrations of advanced management systems and technology related to the subjects of training conducted at the regional training institute.

In order to increase the impact of the training the candidates invited to attend a training programme in a specific railway field (such as rolling stock maintenance, signalling and telecommunication, etc.) would be requested to elaborate a paper describing a problem to be solved in the course of the training programme. The selection of the problem should be sanctioned by the railway management, obliging itself to consider implementation of the solution to be proposed by the participant. (This mechanism could also support the selection of participants.)

When selected, the participants would attend a training course at the regional railway training center with lectures covering mainly the theoretical aspects of the field. Based on the contents and quality of individual and group work the participants for a follow up (complementary) workshop in Switzerland will be selected. In Switzerland the participants will be exposed to demonstrations of technology and its practical applications in the fields related to the subjects covered by the training programme; they will also be given the opportunity to study in-depth their specific problems.

On return to the railway company the participant would be expected to elaborate a paper describing the solution of the problem and/or the measures required to implement the proposal. (This may include a request for technical cooperation.)

167. As stated by SWISSRAIL, such a workshop would be more effectively implemented with SFR as the main HTO, with SWISSRAIL only organizing supporting interventions by its member companies (industry). The willingness of SFR to play this role was not investigated.

Chapter 8**LESSONS LEARNED**

Some of the Conclusions have general validity and can be considered as lessons learned from the evaluation:

168. In the case of awareness raising workshops conducted in areas with extensive needs for awareness raising and/or training, a programme can be relevant even without systematic detailed needs analysis carried out in the field. It must, however, be prepared for a well defined homogenous target group.

169. In spite of the gap between the technology applied by railway companies in the developing countries and that demonstrated at the workshop, the technology demonstrations have the value of setting reference standards which might help the railway companies in, for example, formulating technical specifications for tenders and evaluating these. Nevertheless, it must be acknowledged that - in general - the closer the gap between the technologies, the more relevant the demonstrations of the advanced technologies for the developing country.

170. Management systems and technology demonstrations accompanied by supporting documentation are effective and powerful means of transfer of knowledge.

171.. Economic considerations and methodologies for economic assessment of technological and managerial changes should be an integral part of workshops upgrading technological and managerial knowledge.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION**In-depth evaluation of Railway Transport Development
Workshop Programme Organized by UNIDO in co-operation
with the Government of Switzerland****TERMS OF REFERENCE****I. Background**

National railway systems in many developing countries are faced with a number of problems with respect to effective operations of the railway system such as maintenance, repair and spare parts production; there is a need in the developing countries to develop and strengthen local capabilities in those and other areas. To support human resource development in the railways systems UNIDO has been conducting a number of group training programmes and workshops.

The group training programmes usually last 2 - 3 months; in some cases they are held partly in a developing country. The joint UNIDO/SWISSRAIL Workshop on Railway Transport Development differs from such group training programmes in terms of duration (one week only) and objectives and outputs: while the output of a standard GTP would be defined in terms of additional skills, knowledge and attitudes acquired by the trainees, the project document for the most recent workshop (US/RAF/93/012) under the present evaluation stipulates the following objectives and outputs:

(a) Project objectives

(i) To provide up to 20 high level railway engineers, technicians and managers from developing countries with information on and demonstration of the latest techniques in management, safety, repair and maintenance, spare parts production and the manufacture of railway equipment; and

(ii) To provide the opportunity to review and discuss these techniques, their applicability in the participants' countries and the possibilities for introducing them.

(b) Output:

(i) A technical report on the methodology and modalities of the development of national level programme and rolling stock, R&D engineering services and technical manpower development, including an outline of an interregional training programme project for interested developing countries.

- (ii) *Based on the individual country papers prepared by the participants before the workshop, elaboration of national level project proposals with each of the participants from the developing countries on the individual technical assistance requirements for strengthening the "national engineering service and training" for submission to his her government for implementation under UNDP/IPF finances or through other sources of finances.*
- (iii) *Tentative agreements for industrial cooperation activities between SWISSRAIL members and the participating developing countries.*

As of date, the following joint UNIDO/SWISSRAIL Workshops have been carried out:

<u>Dates</u>	<u>HTO</u>	<u>No. of Participants</u>	<u>From</u>
1. 22-28 November 1987	Zurich	15	Ghana, Indonesia, Jordan, Nigeria, Pakistan, Philippines, Turkey, Zimbabwe
2. 23-29 April 1989	Zurich	12	Argentina, Brasil, Ecuador, Ghana, India, Indonesia, Malaysia, Turkey, Zimbabwe
3. 22-28 April 1990	Baden	19	Bangladesh, India, Indonesia, Iraq, Kenya, Malawi, Malaysia, Philippines, Turkey, Uganda
4. 15-19 March 1993	Fribourg	18	Algeria, Cameroon, Ivory Coast, Madagascar, Mali, Morocco, Romania, Senegal, Tunisia

The first three workshops were conducted in English while the last one was targeted primarily at French speaking African countries.

Before extending further support to the programme, the Federal Office for Foreign Economic Affairs, Bern, decided to undertake an in-depth evaluation of the programme (see fax to UNIDO/FMD dated 6 June 1994). It is the desire of the Federal Office that the terms of reference of the evaluation follow closely the project document, that training beneficiaries and their managers be interviewed (or answer a questionnaire) to verify the impact of the training in the work of the workshop participants.

2. Purpose, scope and method of the evaluation

Purpose The purpose of the evaluation is to assess relevance, effectiveness, efficiency and impact of the joint UNIDO/SWISSRAIL Railway Transport Development Workshop programme.

Scope While the evaluation will cover all four programmes implemented since 1987, the analysis of the project document will focus on its most recent version which should have reflected the recommendations of the self-evaluations carried out in the past.

The principal issue to be addressed by the evaluation is the extent to which the outputs were produced and used to achieve objectives of the programme as defined in the project document (effectiveness) and the extent to which the group training experience and knowledge acquired was put to productive use at the participants' place of work and the improvements achieved as a result (impact). It will be important to identify the conditions which have facilitated or affected the application or transfer of the programme results. These conditions may include: the duties of the participant; his or her personal or organizational ability to influence decisions; the number of participants from the same railway system; the size of the railway system; the stage of economic and technological development of the participant's country; financial capabilities of the company, the nature of its economic management (centrally planned, mixed or market). This list is not exhaustive. Other conditions may be identified.

In addition to analyzing the effectiveness and impact of the programme the evaluation will also assess the relevance of the programme (compliance of the programme with actual needs for HRD in the national railway systems) and its efficiency (by comparison with similar training programmes or alternative strategies of HRD in the national railway systems, and possibilities to reduce cost, etc.)

In particular the following issues will be covered by the evaluation:

Relevance

Origin of the project

Needs analysis and its role in project planning

Adequacy of project planning

- clarity and relevance of the purpose in relation to the needs analysis

- clarity and adequacy of the outputs in relation to purpose

- clarity and adequacy of the intended participants' profile

Perception of the relevance of the programme by the participants and their managers

Efficiency of project implementation

Procedures for recruitment and selection of participants

Administration and logistics

Delineation of project management responsibilities (including UNIDO backstopping)

Monitoring and evaluation of projects

Cost structure

Comparison with alternative approaches (location in a developing country, limited number of countries, longer duration...)

Effectiveness

Actual profile of the participants - experience, qualifications, level and area of responsibility
Quality of the programme
Acquisition of the knowledge and information as specified by the projects document(s)
Quality of the technical report emanating from the workshop and its use
Quality of the interregional training programme proposal
Number, nature and status of the national-level project proposals for technical cooperation
Number, nature and status of agreements for industrial cooperation between SWISSRAIL members and the participating countries

Impact

Application of the knowledge and information acquired at the workshop
Dissemination of the knowledge and information to others
Changes in the railway system resulting from the application of the knowledge and information and from contacts established at the workshop
Follow up of the interregional training programme proposal
Follow up of the national-level project proposals
Follow up of the tentative agreements for industrial cooperation.

Method The final evaluation report will be based on the result of a desk study (analysis of the project documents, training materials, files on implementation, etc.), interviews with relevant sections in UNIDO (HRD, substantive branch, support services), interviews with the HTO and interviews with former participants of the programmes and their supervisors (when applicable) in the following countries: India (8 participants), Tunisia (3 participants) and Turkey (4 participants). The countries are selected with consideration of number of participants, travel costs for the evaluation mission and geographical distribution.

Another country with a larger number of participants (5) is Indonesia. A national short-term consultant will be recruited to conduct the interviews with the participants from that country.

Questionnaires will be sent out to at least 10 additional participants in other countries.

3. Evaluation team

The evaluation will be carried out by a team comprising UNIDO staff (Evaluation Section) and an external consultant selected by UNIDO and agreed upon by the Swiss authority. It would be an advantage if the external consultant had knowledge of UNIDO group training programmes (GTPs).

4. Report

The evaluation report (in English) will follow the structure outlined in UNIDO/DG/B.106 and adopt the following main headings:

1. Summary of conclusions and recommendations
2. Background to the evaluation
3. Design and documentation
4. Implementation
5. Results
6. Conclusions
7. Recommendations
8. Lessons Learned

- Annexes:
- I. Terms of Reference
 - II. Evaluation team
 - III. Work programme and itinerary
 - IV. Persons consulted
(other annexes ad lib.)

The evaluation team's report will be submitted to the Director-General of UNIDO and to the Government of Switzerland. The evaluation team will be required to make an oral presentation of the findings and recommendations at UNIDO Headquarters.

5. Work Programme

see Table I: Work Plan

6. Budget

BL 15	Local travel	900
BL 16	Evaluation Consultant briefing and interviews in Vienna (1 day), briefing and interviews in Switzerland (4 days), field missions to Tunisia (2 days), Turkey (3 days), report writing in Vienna (5 days), home base (3 days), travel and weekends (5 days)	15,600
	fee 9,200	
	DSA 3,400	
	travel 3,000	
BL 16	UNIDO staff (Evaluation Section) Interviews in Switzerland (4 days), field missions to Turkey (3 days) and India (3 days)	5,900
	DSA 2,000	
	travel 3,900	
BL 17	National Short-term Consultant in Indonesia	1,000
BL 35	Meetings for interviews	500
BL 51	Miscellaneous (communications with the field, etc.)	800
TOTAL		----- 25,000 =====

Evaluation Phases and Itinerary of Mission

The evaluation exercise was conducted in three phases:

<u>Phase</u>	<u>Date</u>	<u>Description</u>
1st phase UNIDO Headquarters	31/10/94 to 2/11/94	Desk review of programme documentation, technical reports, interviews, discussions with relevant substantive officers backstopping the programme.
2nd phase Field missions	3/11/94 to 13/11/94	Field trips as identified in the Terms of Reference. Meet/discuss/interviews with former participants to the programme.
3rd phase UNIDO Headquarters	14/11/94 to 18/11/94	Follow-up interviews, synthesis of findings, preparation of the evaluation report and presentation of conclusions and recommendations to relevant parties at UNIDO Secretariat

JV - Joris Verbiest
JM - J.S. Mundrey
JN - Jaroslav Navratil
IF - Imran Farooque

Phase I

31/10/94	Desk review of programme documentation	JV, JN, IF
2/11 to 3/11/94	Discussion/meetings at UNIDO HQ with officers backstopping the programme (UNIDO HQ staff from the Engineering, Human Resource Development Branch and former Non-Governmental Organizations Section.)	JV, JN, IF

Phase II**Itinerary**

3/11/94 a.m.	Bern	Ms. Robert Mr. Ferroni Federal Office of Foreign Economic Affairs	JV, JN
3/11/94 p.m. and 4/11/94	Winterthur	Mr. Dürmüller, SWISSRAIL	JV, JN
5/11/94 to 7/11/94	Bucharest	Mr. Olievschi (Vice President CFR) Mr. Dincescu, CFR Mr. Simion, CFR	JV, JN
8/11/94	Ankara	Ms. Ozogul, UNDP Mr. Haluk Tecer, Turkish Railways	JV, JN
9/11/94	Istanbul	Mr. Ekrem Onal, private industry	
10/11 to 11/11/94	Tunis	Mr. Klibi, Mr. Ghardaddou, Mr. Salma , Tunisian Railways	JV
7/11/94 to 11/11/94	New Delhi	Messrs. Hathi, Pitchumani, Kamal Raj, Raizada, Agarwal (Indian Railways)	JM, IF

Phase III

14/11 to 18/11/94	UNIDO HQ	Synthesizing the findings to form the evaluation report. Presentation of the conclusions and recommendations to relevant UNIDO/HQ Staff	JN, JV, IF
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Questions to former participants

1. Name
2. Job title (present)
3. Who suggested or decided that you should apply?
4. Is there any manpower development plan? Any training needs analysis?
5. Were administrative arrangements satisfactory?
6. Were you satisfied with the information you received about the programme in advance? Did your experience correspond with this information?
7. Did you prepare a country paper?
8. Were the TOR for the country paper clear enough?
9. Was the total duration of the UNIDO programme right? Is it possible to make oneself available for more than one week?
10. Do you think the content of the programme was well organized and presented, in lectures, demonstrations, practical activities, study visits etc.?
11. Were you given any training or reference material? Have you made use of it for training or reference?
12. Were the technology and working practices which you observed in Switzerland relevant to your work or applicable on your own railway? If not, why?
13. Did you learn from discussions with other participants? If so, describe.
14. Do you keep contact with some of the participants from other countries? If so, from which countries?
15. Is occupational homogeneity of participants desirable? What are the advantages, disadvantages?
16. Which specially good points or bad points stick in your mind concerning the programme? What new information was particularly useful?
17. Did you take any particular technical problem for discussion during your programme? If so, did you come away with a solution?
18. Was your country paper discussed at the workshop?
19. Have you prepared any technical cooperation proposals for strengthening the "national engineering service and training"?
20. Have you concluded any tentative agreement for cooperation with SWISSRAIL members? If not, why?
21. When you returned from the workshop, did you report on it to your supervisors or colleagues?
22. Have you been able to apply knowledge or information acquired on the programme?
23. Can you give us an example of a specific change (new process, new procedure, new equipment) which has been introduced on the basis of information you acquired during the programme?
24. If the answer is no, why not? Irrelevance of programme content? Lack of financial or other resources? You are not in a position to initiate change?
25. Is there any corporate strategy (Business Plans) to introduce improvements?
26. Do you think a larger number of participants from one country can increase the impact?
27. Do you think further programmes should be run of the same kind? If so, have you any recommendations for improvements?
28. In which field is there a high demand for training/ awareness raising?
(see the "Structure ...")
29. Do you know about the other UNIDO railway-related training programmes?
30. Other development cooperation agencies providing technical assistance to the Railway in HRD?
31. Who paid 25% for the balance of the travel costs? Would you consider it feasible to request the participants/ their companies to cover a part of the costs?

Tentative questions to supervisors of former participants

1. Name of the company/organization
2. Name
3. What position do you hold in the company/organization?
4. Was the participant selected to attend the workshop recommended by you - if so - what factors/issues contributed towards that decision?
5. Is it possible to release the participants for more than one week?
6. Did the workshop in Switzerland form part of a corporate performance improvement or organizational development programme? Is there any corporate strategy (Business Plans) to introduce improvements? Is there any manpower development plan? Any training needs analysis?
7. Were the materials and handouts provided at the workshop submitted by the participant to other fellow colleagues in the company?
8. After the workshop, did the participant make a presentation for others?
9. Did the participant make use of the newly acquired information and knowledge? How? (Proposals regarding new equipment, maintenance, procedures)
10. Have any measures (proposed by the participant as a result of the workshop) been implemented? If so, what was their impact?
11. Did the participant bring back any technical assistance proposal for strengthening the "national engineering service and training"?
12. If so, was the proposal followed up?
13. Did the participant bring back any proposal for industrial cooperation with SWISSRAIL?
14. If so, was the proposal followed-up? What is the current status?
15. Would you consider sending your staff again to such a workshop or would you recommend the workshop to other staff?
16. Would you consider it feasible to cover part of the costs (travel, DSA) by the company/organization?
17. In which fields is there high demand for training/awareness raising?
18. Other agencies providing technical assistance to the Railways in HRD?
19. Do you know about the other UNIDO railway-related training programmes?

STRUCTURE OF POTENTIAL TRAINING NEEDS IN THE FIELD OF RAILWAYS

1. GENERAL MANAGEMENT

1.1 General

1.1.1 Deregulation, privatisation

1.1.2 Corporate planning, economical studies, investments

1.1.3 Public relations

1.1.4 Safety regulations

1.1.5 Legal affairs

1.1.5 Financial Management (central & analytical accountancy, ...)

1.2 Output

1.2.1 Passenger traffic output

A Marketing studies

B Sales strategy (tarification, special packages, ticketing by computers)

1.2.2 Freight traffic output

A Marketing studies

B Sales strategy

1.3 Human Resources Management

1.3.1 Staffing

A Recruitment

B Training

1.3.2 Payroll management

1.3.3 Social security (retirement, health care, housing, ...)

1.4 Data Processing

1.4.1 Needs analysis

1.4.2 System design, software production & purchase, ...

1.4.3 Management information system (MIS)

1.5 Materials Management

1.5.1 Purchase

1.5.2 Stock management

1.5.3 Quality Assurance & Control

2. OPERATIONS

- 2.1 Rolling stock and train personnel rostering**
- 2.2 Running time calculation**
- 2.3 Line dispatching (traffic control)**
- 2.4 Rolling stock tracking (follow-up of wagons, coaches, locomotives)**
- 2.5 Train and station personnel management and training**
- 2.6 Marshalling yard operations and management**
- 2.7 Intermodal transport**

3. ROLLING STOCK

3.1 Passenger coaches, electric motor units, diesel railcars

- 3.1.1 Design, standardisation**
- 3.1.2 Purchase strategy**
- 3.1.3 Maintenance and repair**
 - A Workshop organisation & layout**
 - B Equipment needs study**
 - C Personnel management and training**

3.1.4 Rehabilitation

3.2 Locomotives

- 3.2.1 Design, standardisation**
- 3.2.2 Purchase strategy**
- 3.2.3 Maintenance and repair**
 - A Workshop organisation & layout**
 - B Equipment needs study**
 - C Personnel management and training**

3.2.4 Rehabilitation

3.3 Freight wagons

- 3.3.1 Design, standardisation**
- 3.3.2 Purchase strategy**
- 3.3.3 Maintenance and repair, renewal**
 - A Workshop organisation & layout**
 - B Equipment needs study**
 - C Personnel management and training**

4. INFRASTRUCTURE

4.1 Buildings, bridges, tunnels

4.1.1 design, studies and construction

4.1.2 maintenance

4.2 Telecommunications

4.2.1 Signalling

A Regulations

B Conception, technical design

C Maintenance

4.2.2 Data transmission

A Telephone

B Telex

C Radio

D Computer Data transmission

4.3 Electric Traction Power Supply

4.3.1 Design

4.3.2 Dispatching

4.3.3 Implementation and maintenance

4.4 Track

4.4.1 Track renewal and maintenance

A Methodology

B Inspection, measuring technology

C Machinery, equipment

4.4.2 Installation of new lines

4.4.3 Track rehabilitation

5. RESEARCH, NEW TECHNOLOGIES

5.1 (non) destructive testing, mineral & organic analysis, measuring devices

5.2 environmental studies

5.3 high speed trains technology

PERSONS CONTACTED**UNIDO Headquarters, Vienna**

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