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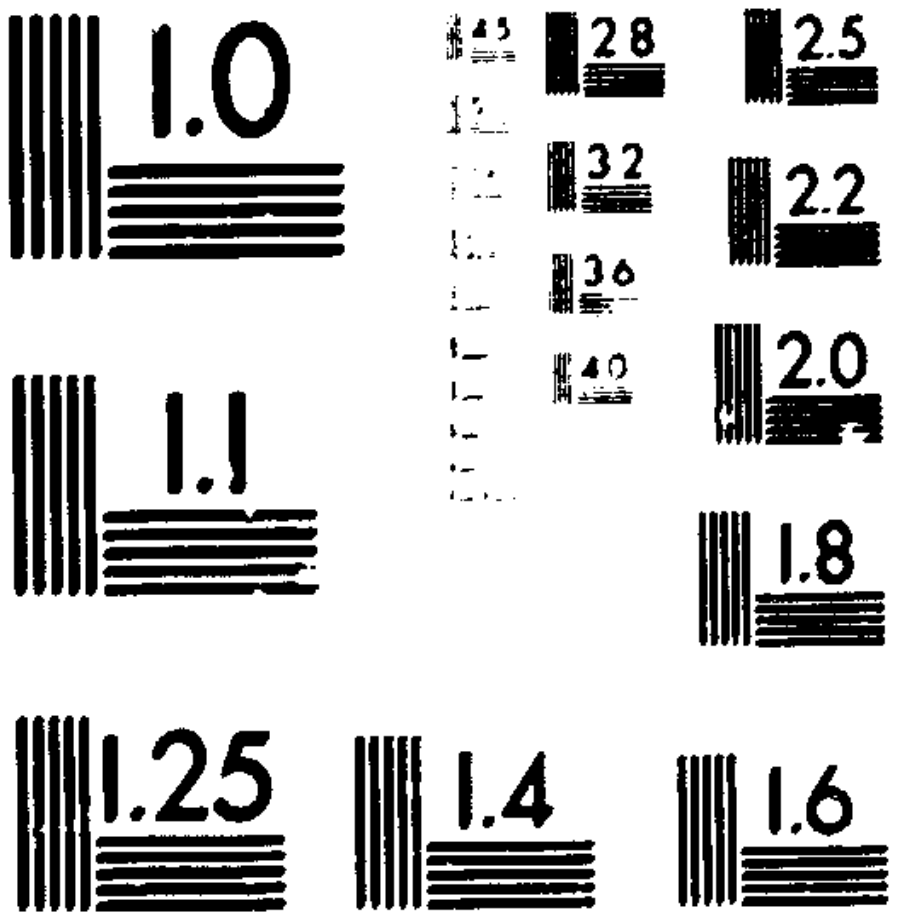

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

14470

IN-PLANT GROUP TRAINING PROGRAMME IN THE FIELD OF MAINTENANCE AND REPAIR OF RAILROAD EQUIPMENT

PREPARATORY ASSISTANCE

ARGENTINA, COLOMBIA AND MEXICO

FINAL REPORT

CONTRACT No: 84/36/RT

PROJECT No: UC/RLA/83/183

DATE: FEBRUARY, 1985

SENER

TABLE OF CONTENTS

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1. SUMMARY

Our Consultant Mr Juan Visa has toured Mexico, Colombia and Argentina interviewing officers of their National Railway Companies, visiting their facilities and meeting as well officers from other organizations thought to be of importance for the successful implementation of UNIDO'S "In-Plant Group Training Programme in the Field of Maintenance and Repair of Railway Equipment".

The information gathered in this field trip points towards grouping Latin American countries according to the status of their Railway operations in three major groups:

- Those countries where the railway already plays a major role within their transportation networks.

- Countries where their Governments are committed to stop the progressive deterioration of their actual network, up to the point of becoming again a significant transportation mode within the national economy.

- Those countries where the railway plays only a marginal role and where no major change is expected within a foreseable period.

The Maintenance and Repair needs detected in the first group of countries call for the adaptation of UNIDO'S programme so as to cater to the needs of Shop Floor Foremen lacking in formal schooling.

On the other hand, the engineering staff of the countries lumped into the second group are perceived as targets of a training programme aimed towards honing the skills necessary to upgrade and effectively modernize their existing rolling stock fleets if their Government commitment is to be successful.

No action is contemplated for the third group of countries.

Finally, regarding a future on which the training programmes might be transferred from Spain to Latin America, the following are recommended as potential future training sites,

- Argentina's facilities for the implementation of UNIDO's modified programme.

- Mexico's installations for the upgraded programme targeted towards the engineering staff of the middle group of countries.

2. BRIEF OVERVIEW OF THE RAILWAY NETWORKS CALLED UPON

The field trip by Mr Juan Visa took place according to the agenda enclosed on appendix I. The trip involved Mexico, Colombia and Argentina as directed by UNIDO.

Mr Visa called upon the national Railway Companies of each host country as well as on other relevant organizations, thought to be of importance, for the future implementation of the training programme. During each stay, Mr Visa attempted to accomodate within his tight schedule, visits at all levels of operation, that is, upper management, professional and shop floor levels.

The attached tables 2.1 through 2.4, gathered in situ, portray the overall characteristics of the visited railway companies. Namely, "Ferrocarriles Nacionales de Mexico", "Ferrocarriles Nacionales de Colombia", "Ferrocarriles Argentinos", and the Buenos Aires Subway Company.

1. INFRASTRUCTURE:

Total length of installed track	=	20000 Kms approx.
Track width	=	1435 mm
Allowable load per axle	=	22-30 tons

2. ROLLING STOCK

Number of powered units	=	1564
Number of freight cars	=	41379
Number of passenger cars	=	1067

Type of powered units.

Diesel-Electric Locomotives supplied by General Electric, General Motors and ALCO (They operate a total of 59 different locomotive models)

3. FACILITIES

Number of maintenance and Depot Facilities = 64

Head maintenance shops located at:

- S. Luis Potosi (Locomotives) manned by 3500 employees
- Aguas Calientes (Cars) manned by 3800 employees

4. MANPOWER

Total number of employees	=	74.882
Maintenance and Repair employees	=	20.000 (approx)
Number of training Centers	=	6

(Main schools located at S. Luis Potosi and Aguas Calientes)

TABLE 2.1= OVERALL CHARACTERISTICS OF "FERROCARRILES NACIONALES DE MEXICO", MEXICO

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1. INFRASTRUCTURE:

Total length of installed track	=	3170 Km
(2000 Kms being presently in operating condition)		
Track width	=	914 mm
Allowable load per axle	=	15 tons

2. ROLLING STOCK

Number of powered units	=	158
Number of freight cars	=	5700
(3700 presently in operating condition)		
Number of passenger cars	=	500
(180 presently in operating condition)		

Type of powered units:

Diesel-Electric locomotives suppied by General Electric and General Motors

3. FACILITIES

Number of maintenance and repair facilites = 6

4. MANPOWER

Total number of employees	=	10500
Maintenance and Repair employees	=	2164

TABLE 2.2 = OVERALL CHARACTERISTICS OF "FERROCARRILES NACIONALES DE COLOMBIA", COLOMBIA

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1. INFRASTRUCTURE:

Total length of installed track	=	34071 Kms
Track width =		it ranges from 750 mm
		up to 1676 mm

2. ROLLING STOCK

Number of powered units	=	1185
Number of freight cars	=	30563
Number of passenger cars	=	1848

Type of powered units:

Diesel Electric Locomotives (726)

Diesel Power cars (57) and

Electric Powered Cars (402) supplied by General Electric, ALCO, General Motors and FIAT.

3. FACILITIES

Number of maintenance and repair facilities = 25

4. MANPOWER

Total number of employees	=	103803
Maintenance and Repair employees	=	20000 (approx)

TABLE 2.3 = OVERALL CHARACTERISTICS OF "FERROCARRILES ARGENTINOS", ARGENTINA

1. INFRASTRUCTURE:

Total length of installed track	=	33 Kms
Track width	=	1435 mm

2. ROLLING STOCK

Number of powered units	=	362
Number of trailer units	=	85

Type of powered units:

Electric powered cars supplied by SIEMENS, G.E., FIAT and others from Belgium and U.K.

3. FACILITIES

Number of maintenance and repair facilities = 5

4. MANPOWER

Total number of employees	=	3000
Maintenance and Repair employees	=	600

Training Schools (closed down since 1962)

TABLE 2.4 = OVERALL CHARACTERISTICS OF BUENOS AIRES SUBWAY, ARGENTINA

3. MAINTENANCE FACILITIES AND POLICIES OF THE RAILWAY NETWORK CALLED UPON

The existing maintenance facilities and the maintenance policies being followed in the visited railway networks are described below:

3.1 MEXICO

"Ferrocarriles Nacionales de Mexico" posseses a total of 64 maintenance and depot facilities manned by close to 20.000 employees. Among them, those located at S Luis Potosi (Locomotives) and Aguas Calientes (Cars) are particularly important, employing 3.500 and 3.800 people, respectively.

The maintenance facilities at Pantaco and Valle de Mexico were actually visited. These premises house a total of 1.500 employees ranked according to the following work categories:

- Superintendent ("Superintendente")
- Assistant to the Superintendent
- Master Mechanic ("Maestro Mecanico")
- Assistant Master Mechanic
- Master Builder ("Maestro Constructor")
- Foreman ("Mayordomo")
- Foreman Assistant
- Mechanics, electricians, etc.

It must be pointed out that work progression up to the Foreman level is strictly on a seniority basis without formal training. This state of affairs is a direct result of the control exercised up to that particular level by the Railway Labour Union.

On the other hand, the appointements down to the Master Builder category are awarded by the company on a merit system.

The maintenance policies, applied at these facilities, are, as explained by the Engineers Messrs Fernandez (Cars) and Olivares (Locomotives), the following

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a) Locomotives

I. Trip Inspection (after 400Km) involving brakes and lighting systems

II. Monthly Inspection - Filter changes

III. Half yearly Repair - Injector changes

IV. Yearly Repair (equivalent to 150/200.000 Kms)

b) Cars

I. Preventive Maintenance and Minor Repair Work - "Spot System"

II. Mayor Overhauling

Actual review of the ongoing work during the visit to the shop did reveal, however, a predominance of repair work due to accident or malfunction over work targeted towards preventive maintenance.

3.2 COLOMBIA

"Ferrocarriles Nacionales de Colombia" was created back in 1954 by nationalizing different private companies which operated independently up to that point.

Their theoretical track length of 3170 Kms, comes down to 2000 Kms of actual operating line along the corridors Bogota-Sta Marta and Medellin-Puerto Berrio.

The railway officers interviewed revealed that from 5700 freight cars only 2000 may be put into service and from 500 passenger cars available in their stock, only 180 are in operating order.

An actual visit to any of their 6 Rolling Stock maintenance Facilities could not be accomodated in the trip schedule, however, above figures are meaningful enough, regarding their maintenance status.

The railway engineers did also mention that their maintenance policies were simply those recommended by the rolling stock manufacturers.

Their maintenance organization is arraged as follows:

- Shop Floor Director
- Department Heads (Diesel and Production)
- Section Chiefs
- Mechanics, Electricians, etc.

A particular feature of their organization is that after 15-20 years of service. the employees may (and do) opt for retirement with full benefits. This results in a particularly high turnover of personnel.

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3.3 ARGENTINA

3.3.1 - "Ferrocarriles Argentinos"

"Ferrocarriles Argentinos" has a network of up to 25 Shop Floor and 100 Depots serving their main 6 Railway lines. Namely:

Railway Line	Shop Floors
Roca	Bahia Blanca, Remedios de Escalada, El Maiten, Spurr
Mitre	Perez, Rosario, Villa Diego
S. Martin	Junin, Mendoza, Alianza
Sarmiento	Liniers, Villa Luro
Urquiza	Parana, Monte Caseros, Lych
Belgrano	Cordoba, S.Cristobal, Laguna Paiva

The facilities serving locomotives (Mendoza, Perez, Spurr, Liniers, Villa Luro, Parana and Cordoba) employ 3707 people, while the other facilites serving mainly cars retain 6456 employees.

Generally, repairs of groups, assemblies and sub-assemblies are carried out in the Shop Floors, while changes of these elements and short cycle inspections take place in the Depots.

The Shop Floor organization is as follows:

- Shop Floor Chief
- Production Chief, who supervises the Diesel Section Chief, the Electrical Section Chief and the Assembly and Disassembly Chief.
- Control and Plannig Chief who supervises the Supplies Chief, Plant Maintenance Chief, Planning Chief and Methods and Times Chief.

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2.3.2 - BUENOS AIRES SUBWAY COMPANY

The Buenos Aires Subway Company operates five shop floors employing 600 people. They perform periodic inspections although major overhauling is usually subcontracted. Specifically, they review their cars every 3000 Kms, which is equivalent to twice monthly. This imspection involves 2 hours approximately, coincident with the line demand valleys. Mayor overhauling takes place every 200-250.000 Kms, involving 5000 manhours per unit over a two month period. This work is generally subcontracted to third parties, although the work is supervised by the Buenos Aires Subway engineers.

The shop floor organization includes:

- Shop Floor Chief
- Shop Floor Assistant to the Chief
- Intermediate Staff
- Shop Foremen

The first three levels correspond to college graduate engineers, while Shop Foremen do not necessitate of formal schooling.

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4. ESTIMATED TRENDS IN THE FUTURE DEVELOPMENT OF THE LATIN AMERICA RAILWAY NETWORKS

In addressing the railway transportation within Latin America, it is enlightening to note that three countries alone, Mexico, Brazil and Argentina, own 75% of the total network and 80% of the manpower resources. The attached table 4.1 shows the relative importance within each Latin American country of railway transportation, expressed in terms of passenger-kilometers and ton-kilometers.

Other than the three mentioned countries, a second group may be assembled to represent those countries where the railway is of growing importance, within the national economy, for the transportation of goods. Colombia, Chile, Peru and Uruguay might be placed within this group.

The third group would be comprised of those countries where the railway has only a marginal role to aply within the national transportation networks, as exemplified by most Central American countries.

Before addressing the actual differences within those groups, the reader should be aware of the common traits. In this regard, it must be remembered that most Latin American Railway operations began at the turn of the century as private enterprises ferrying goods from interior locations to the export harbours. In the late forties, a nationalizing movement swept throughout the continent resulting in the consolidation of very different systems under a single organization. This in turn provoked very serious maintenance problems in terms of spare parts scarcity, lack of new investments and accelerated aging of the infrastructure and the rolling stock.

This state of affairs led to an increase in the number of accidents and a subsequent drop in revenues both for passenger and freight transport, due to the public growing distrust in this mode of transportation.

Therefore, we might summarize the common traits of Latin America Railway Networks as follows:

- Predominance of transportation of goods over transportation of passengers, with the exception of a few isolated corridors

- Rolling stock fleets involving too many different models which hinders the implementation of an efficient approach to the management of stocks and the succesful application of preventive maintenance programs

- General lack of new investments to improve the existing infrastructure. This implies that the resultant accidents and malfunctions call for repairs that tie-up the resources that could, otherwise, be dedicated to preventive maintenance operations.

- Dependance of many countries on outside sources for the supply of spare parts

The trends which are foreseen in the future development of the Latin American networks are necessarily tied to the solution of some of above problems which are shared by most Latin American countries.

Countries like Argentina, Brazil and Mexico where the railway already represents a prime mode for the transportation of goods are expected to address more easily the problems posed, as a natural outgrowth from their present operations.

Colombia,on the other hand, exemplifies those countries (Chile, Peru, Uruguay, ...) where the Governments appears to be committed to improve their railway network, in spite of their present difficulties which call for a radical shake-up to streamline their operations.

Their present status, in the case of Colombia, is highligthed by the following:

- Infrastructure (i.e.: only 65% of installed track in usable conditions)
- Rolling stock (i.e.: only 35% of equipment in operating conditions)
- Manpower (i.e.: low productivity, high turnover)

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Tangible examples of the Colombia Government commitment are the construction of both the new line for the transport of coal from the Cerrejon mines and the Medellin Subway.

Countries outside those two groups are not expected to undergo major changes.

	SURFACE ($x10^3$ Km^2)	ESTIMATED POPULATION ($x10^6$)	LENGTH OF TRACK (Kms)	NUMBER OF EMPLOYEES	PASSENGER-KILOMETERS ($x10^6$)	TON-KILOMETES ($x10^6$)
. EL SALVADOR	21	4.5				
F.N. de E.S.			602	1647	14	31
. GUATEMALA	132	7.1				
F. de G.			927	3301		91
. HONDURAS	112	3.6				
F.N. de H.			205	6	7.8	28.8
. MEXICO	1967	69.3				
F.M.			19908	96992	5286	43801
. NICARAGUA	148	2.65				
F. de N.			345	1106	14.6	6.4
. PANAMA	77.1	1.9				
F. de P.			118	250	37.6	10.3
. PARAGUAY	407	3.2				
F.C.C.A.L.			488	826	21.7	23

TABLE 4.1 (Cont'd)= OVERALL COMPARISON OF LATIN AMERICA RAILWAY TRANSPORT

	SURFACE ($x10^3$ Km^2)	ESTIMATED POPULATION ($x10^6$)	LENGTH OF TRACK (Kms)	NUMBER OF EMPLOYEES	PASSENGER-KILOMETERS ($x10^6$)	TON-KILOMETERS ($x10^6$)
. ARGENTINA	3761	28.0				
F.A.			35396	95804	11258	9260
Subway B.A.			37	3437	766	--
. BOLIVIA	1099	5.7				
E.N. de F.			3838	6989	482	631
. BRAZIL	8512	122.				
R.F.F.S.A.			24325	87337	10018	31807
FEPASA			6668	19356	2536	6893
Subway S.P.			56	4012	1460	--
Subway R. de J.			36	2827	405	--
. CHILE	2007	11.3				
E.F. del E.			7882	9238	1544	1300
. COLOMBIA	1142	29.				
F.N. de C.			3403	9788	235	625
. CUBA	111	10.1				
F. de C.			5302	25610	1571	1904
. ECUADOR	281	8.7				
E.F. del E.			965	2622	65	32

TABLE 4.1= OVERALL COMPARISON OF LATIN AMERICA RAILWAY TRANSPORT

	SURFACE ($x10^3$ Km^2)	ESTIMATED POPULATION ($x10^6$)	LENGTH OF TRACK (Kms)	NUMBER OF EMPLOYEES	PASSENGER-KILOMETERS ($x10^6$)	TON-KILOMETERS ($x10^6$)
. PERU	1285	18.3				
ENAFER				5861	456.5	566
E.N.C.P.			272	652	38.5	121
. URUGUAY	176	2.95				
A.F. del E.			3004	10545	338.6	221
. VENEZUELA	912	14.6				
F. del E.				788	9.7	13

SOURCE: 1981 STATISTICAL YEARBOOK

FROM A.L.A.F. ("ASOCIACION LATINOAMERICANA DE FERROCARRILES")

TABLE 4.1 (Cont'd)= OVERALL COMPARISON OF LATIN AMERICA RAILWAY TRANSPORT

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5. PRELIMINARY FINDINGS REGARDING TRAINING NEEDS

The field survey has revealed that Mexico and Argentina are staffed at their upper levels of their Maintenance and Repair Departments by competent graduate engineers with solid backgrounds on the techniques of preventive maintenance and on the operation of Repair Shop Floors. They appear to be lacking, however, at their shop foremen level of the necessary theoretical background which would boost their hands-on experience and upgrade their leadership capabilities.

Mexico has excellent training facilities geared towards shop floor practices, but not beyond a level which would be suitable for foremen. Argentina again suffers from the lack of foremen with formal schooling.

Colombia, as representative of the second group of countries, requires a two-fold approach. First, as Argentina and Mexico, their foreman level might greatly benefit from a theoretical program to complement their practical experience. Second, their Maintenance and Repair upper staff necessitates of a training program addressed to enhance their advisory position in front of their Company upper management regarding future equipment purchases and infrastructure investments. As discussed before, Colombia and the assimilated countries, require a mayor shake-up intended to:

- Streamline their maintenance and repair operations by upgrading present practices regarding shop floor operations (work planning, management of stocks, quality control procedures, etc.) and the effective implementation of preventive maintenance policies.

- Standardize their rolling stock fleet in order to diminish their present awesome range of required spare parts.

It is worth of note as well to draw attention to the fact that throughout all the visited countries, the present state of the railway track infrastructure may be blamed for a high number of accidents and equipment malfunctions.

Therefore, upgrading present practices on the proper care and rehabilitation of the track, track equipment, sleeper ties, ballast and sub-grades and superstructures is deemed of at least equal importance to that to be applied to the rolling stock.

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6. PRELIMINARY RECOMMENDATIONS ON FUTURE TRAINING PROGRAMMES

The preliminary recommendations on future training programmes are obviously intertwined with the preliminary findings regarding training needs detected during the field trip and discussed on the previous article. Thus, the recommeded training programs are envisaged at two different levels:

- LEVEL I:

  Training programs targeted for Shop Floor Foremen and intended to complement their practical experience in connection with shop floor practices, and fill-out their present lack of formal training.

  The contents of the program should therefore correspond to a scaled-down version of the training programme, already implemented by UNIDO in the African-English-speaking countries (i.e.: Project No US/RAF/84), with greater emphasis on theoretical aspects.

  The targeted population would comprise the foremen of both the countries in the first group (Argentina, Brazil and Mexico) as well as in the second group (Colombia, Chile, Peru, Uruguay, ...).

- LEVEL II:

  Training programmes targeted for University graduate engineers with present responsibilities in the area of maintenance and repair in those countries assimilated to the second group (Colombia, Chile, Peru, Uruguay, ...).

  The training programs should then correspond to an upgraded version of the programmes already implemented by UNIDO in Africa, with special emphasis on:

  - Management of spare parts stock
  - Renewal and standardization of rolling stock
  - Impact assesment unto railway operations of track and substructure maintenance procedures
  - Contracting practices
  - Short and long-term investment planning,

  with liberal use of the case-history approach.

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7. PRELIMINARY SELECTION OF THE TRAINING SITE

The existing training infrastructure in Latin America is reviewed, being followed by the training site alternatives and preliminary recommendations.

7.1 EXISTING TRAINING INFRASTRUCTURE IN LATIN AMERICA

The existing training facilities in the subject countries, as disclosed by the field trip, are as follows:

a) MEXICO

"Ferrocarriles Nacionales de Mexico" has a training infrastructure comprising 6 training schools with 75 full-time instructors and 200 assistants.

S. Luis Potosi and Aguas Calientes are the location of the better staffed facilites, with other important training centers in Veracruz, Valle de Mexico and Monterey. The schools have welcomed in the past trainees from other Latin American countries.

The visit to the Valle de Mexico school confirmed the adequacy of the material facilities, even though a closer look might show certain disparity between written programme goals and actual achievements.

b) COLOMBIA

"Ferrocarriles Nacionales de Colombia" has a training staff of up to 20 full-time instructors, even though they do not have training facilities as such and the programmes, are said, to be imparted at the workstations themselves. They admit to having sent in the past trainees to the Mexican Facilities.

c) ARGENTINA

"Ferrocarriles Argentinos" has a training organization numbering some 120 full-time instructors plus an extra 200 to 300 instructors who might be called upon if necessary. Again their training programmes are aimed towards specific shop floor practices, while relying on local universities to cater for the training needs of their engineering staffs. They also

rely on the CONET ("National Council of Technical Education") on an adisory and consulting capacity regarding the continuing education of instructors.

The Buenos Aires Subway Comoanv discontinued back in 1962 their ongoing training programs and again they rely on outside organizations for the training needs of their staff.

Other than the Railway organizations themselves, the cooperation of the following organizations might prove helpful in the implementation of the training programme:

- A.L.A.F. (Latin American Railway Association) who is committed to the promotion and development of Railway transport within Latin America, fostering the technical exchange and education among member countries.

- The General Directorate of Railways from the Communications and Transport Secretary of the Mexican Government who showed their willingness to collaborate on such a programme.

7.2 TRAINING SITE ALTERNATIVES AND RECOMMENDATIONS

At present, Spain, because of its experience and resources, is the ideal candidate to host training programmes for Latin American Railway Officers.

Upon the belief that in some distant future, it might become feasible and desirable to move over to Latin America these training programmes, the field trip has included also a review of the available training facilities.

Based on these visits, both Mexico and Argentina merit to be considered as future host countries of the subject training programmes.

As the site for the training programme referred as Level I, Mexico however has the drawback of an all too powerful Labour Union whose cooperation might be difficult to coordinate vis a vis the Mexican Railways and the Mexican Government's General Directorate of Railways.

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On the other hand, Mexico offers distinct advantages as host country to the so called Level II programme because of their well supplied training installations (S. Luis Potosi and Aguas Calientes) and its proximity to the United States for educational field trips to rolling stock manufacturing plants.

Therefore,

1) For the immediate future, Spain is considered the most suitable site for both Level I and Level II training programmes.

2) For that future, on which it becomes feasible to transfer to Latin America, these training programmes:

   Argentina is recommended as the site for the Level I training programme targeted for Shop Floor Foremen of countries such as Argentina, Mexico, Colombia, Chile, Peru and Uruguay, counting on the back-up of

   a) "Ferrocarriles Argentinos"
   b) A.L.A.F.
   c) and, possibly, C.O.N.E.T.

   Mexico is recommended as the site for the Level II training programme aimed to the engineering staffs of countries such as Colombia, Chile, Peru and Uruguay, counting on the back-up of

   a) "Ferrocarriles Nacionales de Mexico"
   b) The General Directorate of Railways from the Mexican Government
   c) A.L.A.F.

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APENDIX I

FIELD TRIP AGENDA

SENER

I.I. - MEXICO

ARRIVAL DATE : JULY 12, 1984
DEPARTURE DATE : JULY 19, 1984

ORGANIZATIONS CALLED UPON:

a) UNIDO, on July 13 and on July 17

People contacted:

Messrs Gustavo Silva and Hans Steer

b) "FERROCARRILES NACIONALES DE MEXICO" on July 13, 16 and 17th

People contacted:

Mr Ramon Recio Flores. Assistant Manager for Powered and Trailer Units

Mr Enrique Palau Castillo. General Superintendent for Powered and Trailer Units

Mr Manuel Fernandez Espinosa. Engineer in charge of cars maintenance

Mr Felipe Olivares. Engineer in charge of Locomotives maintenance

Mr Joaquin Orellana. General Foreman of Pantaco Shop Floor

Mr Gonzalez Aguirre. Director. Training School

Mr Manzano. Assistant Director. Training School

c) "ASOCIACION DE INVESTIGACION DEL TRANSPORTE" on July 18th

People contacted:

Miss Cristina Smith. Field Representative

d) "DIRECCION GENERAL DE FERROCARRILES" from the Communications and Transport Secretary of the Mexican Government on July 18th

People contacted:

Mr Matias Carrasco Carmona. Director of Technical Analysis and Control

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I.2. - COLOMBIA

ARRIVAL DATE : July 19th
DEPARTURE DATE : July 24th

ORGANIZATIONS CALLED UPON:

a) UNIDO on July 23rd

People contacted:

Messrs Luis Thais and Gabriel Mendoza (over the phone)

b) FERROCARRILES NACIONALES DE COLOMBIA on July 23rd

People contacted:

Mr Jose Joaquin Vargas. General Director of Shop Floors
Mr Nestor Rojas. Chief Engineer. Training Department

c) BOGOTA SUBWAY COMPANY on July 23rd

People contacted:

Ms Lucila Castro. Financial assistant Director

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I.3. - ARGENTINA

ARRIVAL DATE : JULY 24th
DEPARTURE DATE : JULY 28th

ORGANIZATIONS CALLED UPON:

a) FERROCARRILES ARGENTINOS on July 26 and 27th

People contacted:

Mr Tzicas. General Director
Mr Iliquelli. Training Director

b) BUENOS AIRES SUBWAY on July 26 and 27th

People contacted:

Mr Eduardo Mariategui. Technical Director
Mr Ariel G. Mercado. Planing Department Director
Mr Testa. Shop Floor Superintendent

c) ASOCIACION LATINOAMERICANA DE FERROCARRILES on July 25 and 27th

People contacted:

General Flouret. President
Mr Angel Ceci. Training and Technical Assistance

Remark:

Throughout the three countries visited, it appeared as if the UNIDO field representatives were not forewarned of Mr Visa's trip.

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

IN-PLANT GROUP TRAINING PROGRAM IN THE FIELD OF MAINTENANCE AND REPAIR OF RAILROAD EQUIPMENT

PREPARATORY ASSISTANCE

ARGENTINA, COLOMBIA AND MEXICO

DRAFT REVISION

TO THE

DRAFT PROJECT PROPOSAL

CONTRACT NO.: 84/36/RT

PROJECT NO.: UC/RLA/83/183

DATE : SEPTEMBER 6, 1983

SENER

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

DRAFT PROJECT PROPOSAL

PART A: BASIC DATA

COUNTRY/REGION : REGIONAL LATIN AMERICA

PROJECT NUMBER : US/RAL/....

PROJECT TITLE : IN-PLANT GROUP TRAINING PROGRAMME IN THE FIELD OF MAINTENANCE AND REPAIR OF RAILROAD EQUIPMENT

Training Programme LEVEL I

Target Population : Shop Floor Foremen

DURATION : 6 weeks

ORIGIN AND DATE OF OFFICIAL REQUEST : UNIDO's proposal

GOVERNMENT COUNTERPART AGENCY :

UNIDO CONTRIBUTION :

GOVERNMENT CONTRIBUTION :

CURRENCY REQUIRED : US $ 83,168

. FOR UNIDO INPUT :
. CONVERTIBLE :
. OTHER :

UNIDO SUBSTANTIVE BACK-STOPPING SECTION : Training Branch, DIO

PROGRAMME COMPONENT CODE: 31.5.C

SENER

COUNTRY/REGION : REGIONAL LATIN AMERICA

PROJECT NUMBER : US/RAL/....

PROJECT TITLE : IN-PLANT GROUP TRAINING PROGRAMME IN THE FIELD OF MAINTENANCE AND REPAIR OF RAILROAD EQUIPMENT

Training Programme LEVEL II

Target Population : University Graduate Engineers

DURATION : 4 weeks

ORIGIN AND DATE OF OFFICIAL REQUEST : UNIDO's Proposal

COVERNMENT COUNTERPART AGENCY :

UNIDO CONTRIBUTION :

GOVERNMENT CONTRIBUTION :

CURRENCY REQUIRED : US $ 70,116

. FOR UNIDO INPUT :
. CONVERTIBLE :
. OTHER :

UNIDO SUBSTANTIVE BACK-STOPPING SECTION : Training Branch, DIO

PROGRAMME COMPONENT CODE: 31.5.C

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PART B: NARRATIVE

I. OBJECTIVES

(a) Development Objective:

The development objective of the project is to assist recipient countries in improving the transport system by having rolling stock, through improved maintenance systems and practices, in better working conditions, thus assisting all sectors of economy.

(b) Immediate Objective:

The immediate objective is to upgrade the knowledge and provide experience to participants in the field of systems and practices of maintenance and repair of railway rolling stock equipment, as well as to assist them in their efforts to renew efficiently their rolling stock fleet.

II. SPECIAL CONSIDERATIONS

One of the most important constraints faced by the railway companies in developing and improving their network services, namely as support for transport of industrial goods, consists of the lack of engineers and technicians qualified in the field of maintenance and repair.

III. BACKGROUND AND JUSTIFICATION

Within the framework of its in-plant group training programmes, UNIDO initiated in 1971 a training programme in the field of maintenance of railway equipment (rolling stock), financed as contribution in kind by the Government of the Federal Republic of Germany, which was organized three times for English

speaking participants. The project has been successful and it was found that this type of training meets a realistic need in most developing countries.

Therefore similar in-plant group training programmes were organized from 1976 until 1981 in Belgium by the "Société Nationale des Chemins de Fer Belges" for French-speaking countries. Since 1981 this programme has been partially transferred to the Ivory Coast and Upper Volta, the participants being trained in the workshops of the Régie Abidjan-Niger (RAN) after the completion of the programme in Belgium.

Considering, however, the problems faced by the railway companies in English-speaking African countries, the Union of African Railways suggested that a programme on maintenance of railway equipment should be reinstated by UNIDO for the English-speaking countries.

Thanks to a special contribution of the Government of the United Kingdom to the United Nations Development Fund (UNIDF), UNIDO will organize again a programme for participants from African English-speaking countries.

Considering that railway companies in Latin America are also facing important maintenance problems, it is proposed to organize in Spain an in-plant group training programme in Spanish in the field of railway equipment taking into account the experience gained in Belgium, Ivory Coast, Upper Volta and the United Kingdom.

IV. PROJECT OUTPUT

15 participants from Spanish-Speaking developing countries in Lating America will be trained in maintenance techniques and management of railway rolling stock equipment.

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V. PROJECT ACTIVITIES AND MODALITIES OF IMPLEMENTATION

V.A PROGRAMME LEVEL I

This programme, intended for Shop Floor Foremen and having a total duration of 6 weeks, will be arranged as follows:

(a) Theoretical Residence Course (2 weeks)

This part of the programme will cover lectures and discussions on the following topics:

1. Basic Economic Principles of the maintenance of Rolling Stock
2. Relation of Maintenance to investments in new rolling stock (LEVEL I)
3. Organization of Maintenance Schedules (statistical background)
4. Short and long-term planning of workshop performance
5. Analyses of workshop operation and Progress Control (LEVEL I)
6. Technical and Economic Control (LEVEL I)
7. Machinery, Equipment and Methods in Repair and Maintenance Workshops
8. Spare Parts Purchasing
9. Stocks Management. Use of Computers

10. Accounting Methods. Use of Computers

11. Training Methods (LEVEL I)

(b) Practical In-Plant Training (3 weeks)

Application of some of the principles and techniques covered in the above theoretical course by actual case study review.

(c) Factory Visit and Programme Evaluation (1 week)

Visits will be paid to nearby Locomotives and Car manufacturers.

Feedback will be obtained from the participants in order to improve the future implementation of the training programme.

V.B PROGRAMME LEVEL II

This programme, intended for University Graduate Engineers and having a total duration of 4 weeks, will be arranged as follows:

(a) Theoretical Residence Course (2 weeks)

This part of the programme will cover lectures and discussions on the following topics:

1. Economic Principles of the Maintenance of Rolling Stock

2. Impact into Rolling Stock Performance of Railway Infrastructure Maintenance

3. Relation of Maintenance to Investments in new Rolling Stock (LEVEL II)

4. Investment Analyses and Contracting Practices

5. Advantages of Rolling Stock Standardization

6. Organization of Maintenance Schedules and Resultant Planning of Workshop Operation

7. General Principles of Railway Infrastructure Maintenance

8. Analyses of Workshop Operations and Progress Control (LEVEL II)

9. Technical and Economic Control (LEVEL II)

10. Spare Parts Purchasing, Stocks Management and Accounting Methods

11. Training Methods (LEVEL II)

(b) Factory Visits and Programme Evaluation (2 weeks)

Visits will be paid to Locomotives and Car Manufactures within Spain (C.A.F, MACOSA, Babcock & Wilcox, Talgo, etc.).

Feedback will be obtained from the participants in order to improve the future implementation of the training programme.

VI. PROJECT INPUTS

- International travel for 15 participants including 10 kg excess luggage for return;

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- Daily subsistance allowance for the total duration of the seminar;

- Internal travel in the country necessary for the implementation of the programme;

- Training fees requested by organizing institution;

- Mission of UNIDO staff member to evaluate de programme;

- Sundries

VII. EVALUATION PLANS

A UNIDO staff member will evaluate the programme at its completion through individual and group discussions and by having the participants complete and end-programme evaluation questionnaire.

VIII. ENVISAGED FOLLOW-UP

Providing its successfull implementation the programme will be repeated on a pluri-annual basis, as this is the case for the French and English programmes.

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PROJECT BUDGET

LEVEL I	US $
- International travel for 15 participants including 10 kg excess luggage for return, for an estimated average distance and for the average of excursion and regular tariffs	22,800
- Daily subsistence allowance for the total duration of the seminar (6 weeks) + 2 days for travel : US $ 55 x 44 days x 15	36,300
- Internal travel in the country necessary for the implementation of the Programme	2,000
- Training fees requested by the organizing institution	10,000
- Missions of UNIDO staff member to prepare and evaluate the programme (1 round trip plus 3 days DSA)	1,500
- Sundries	1,000
Subtotal	73,600
+ 13% overhead	9,568
LEVEL I - TOTAL	83,168

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LEVEL II	US $
- International travel for 15 participants including 10 kg excess luggage for return, for an estimated average distance and for the average of excursion and regular tariffs	22,800
- Daily subsisterte allowance for the duration of the theoretical course:	
US $ 55 x 30 days x 15	24,750
- Internal travel in the country necessary for the implementation of the programme	2,000
- Trainning fees requested by organizing institution	10,000
- Missions of UNIDO staff member to prepare and evaluate the programme (1 round trip plus 3 days DSA)	1,500
- Sundries	1,000
Subtotal	62,050
+ 13% overhead	8,066
LEVEL II - total	70,116

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LEVEL I + LEVEL II GRAND TOTAL = US $ 153,284

BUDGET ESTIMATE FOR A 4 YEARS PROJECT

Taking into consideration an increase of 5% per year, the budget would be of:

LEVEL I US $	LEVEL II US $	TOTAL	
83,168	70,116	153,284	for 1984
87,326	73,622	160,948	for 1985
91,693	77,303	168,996	for 1986
96,277	81,168	177,445	for 1987
358,464	302,209	660,673	for the period 1984-1987