OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

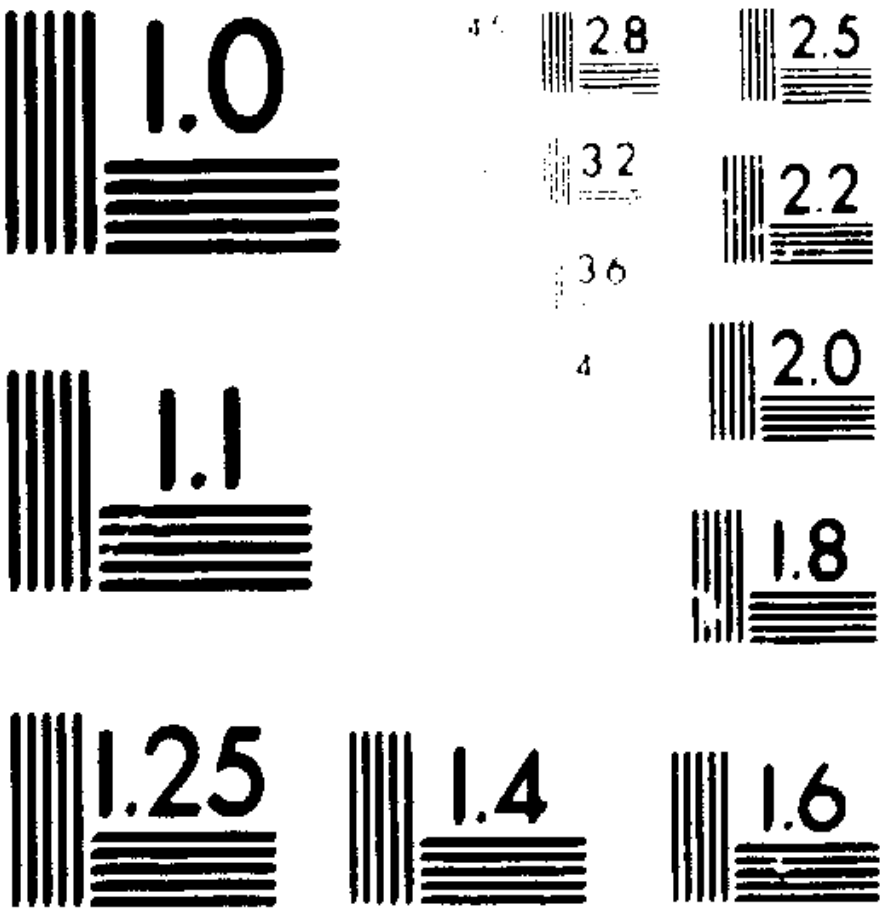
FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org



09997

UNITED NATIONS INDUSTRIAL DEVELOPMENT

ORGANISATION

PROJECT: DP/PER/72/027/11-03/02

Peru.

Advice in the Training of Project Personnel for the Nazca Iron and Steel Project

~~INTERIM REPORT~~
(Half-Yearly)

by

ING° BENEDICT FERNANDEZ, BE(Mech). BE (Elect) F.I.E.

UNIDO EXPERT

AUGUST, 1975

UNITED NATIONS INDUSTRIAL DEVELOPMENT

ORGANISATION

PROJECT: DP/PER/72/027/11-03/02

Advice in the Training of Project Personnel for the Nazca Iron and Steel Project

INTERIM REPORT

(Half-Yearly)

by

ING° BENEDICT FERNANDEZ, BE (Mech). BE (Elect) F.I.E.

UNIDO EXPERT

AUGUST , 1975

CONTENTS

1. INTRODUCTION

1.1 My appointment was, and technically speaking still is, to the post of "Advisor in the training of project personnel for the Nazca Iron and Steel Project", though, since some time I have also been requested to advise on the aspect of manpower planning and training for the steel sector in Peru as a whole.

1.2 On arrival in Lima on February 11th, 1975, I was taken around by Mr. P. Lamarche, Asst. Field Advisor, UNIDO in Lima, introduced to the Resident Representative, UNDP, and the officials of the Ministry of Industries and Tourism, under whose direction falls the development of the steel industry in Peru. Since INDUPERU, a Government of PERU undertaking, is charged with the task of examining the feasibility studies for the Nazca project I was attached to this organisation, with whom I have been working from February 12th, 1975.

1.3 I have already sent to UNIDO headquarters the following two reports:

a) A Preliminary Report, under cover of my letter dated 17th March, 1975.
b) An Interim Report, dated 16th April, 1975 with two enclosures.

These reports have been examined by the Metallurgical Industries Section at Headquarters, and I have made a note

of their comments. I have noted also, that the procedure being followed by me in the matter of manpower planning and training for the Hanoa Project has their general approval.

1.4 In the process of following the Programme of Work sent along with my Preliminary Report, I discovered that the manpower situation here, in respect of availability of qualified persons for training, was quite disconcerting. A massive training programme in depth would have to be planned and implemented without delay. The problem would have to be attacked from various directions simultaneously. This was pointed out by me to the relevant Government officials and departments. Sir Maurice Fiennes, UNIDO Advisor to the Government of Peru on the Strategy of developing the national Steel Industry, and Mr. P. Cuevas-Cancino, Senior Technical Field Advisor were kept informed by me of the situation.

1.5 Sir Maurice Fiennes was quick to grasp the realities of the situation and was greatly instrumental in getting the Government authorities to act quickly. In view of the magnitude of the problem, the complexities, and the urgency, the Government of Peru, after consulting me, requested the extension of my services by six months. This has since been approved by UNIDO in Vienna.

1.6 It was pointed out that, among other things, in any plan for the training of steel plant personnel, the Chimbote plant of SIDERPERU, would have to bear a major portion of

the load of actual training. SIDERPERU is a Government of Peru undertaking, charged with the responsibility of developing, managing and operating the steel industry in Peru. It presently manages and operates a small steel plant of 450,000 tons/year capacity at Chimbote, about 450 Km. north of Lima. It's department of development of personnel, should therefore be actively involved in any plan for the training of steel plant personnel. I therefore requested that my counterpart be the head of this department, and Sir Maurice Fiennes too, in one of his memorandums to the Director Superior, Ministry of Industry and Tourism, strongly advised such a course of action.

1.7 The Ministry accepted this advice, and effective from May 13th, I was requested to advise and assist SIDERPERU, in addition to continuing my assignment with INDUPERU in connection with the Nazca Project. I was given a counterpart in Ingº Isaac Patron, Director of Development of Personnel, Chimbote Works of Siderperu. Since my work would have country-wide implications involving other ministries too, I was requested to maintain close liaison with the Ministry of Industries and Tourism, and work under its overall direction.

1.8 This Interim Report (half-yearly) in addition to detailing the work done since the submission of my last report, also indicates a strategy and action plan, with emphasis on implementation. An attempt has been made to be brief, since the enclosures contain in detail my comments, ob-

servations, recommendations and proposals. Further, I have avoided going into the technical details of the proposed projects in regard to technology, equipment, processes etc. as all these have been very well covered by Sir Maurice Fiennes in his Interim Report of May 75, a copy of which he has given me.

1.9 This Interim Report (Half-Yearly) is accompanied by FIVE Enclosures, which have all been prepared since sending my report of April 75, and which have not so far been sent by me to UNIDO Headquarters. To avoid repetition, the enclosures sent by me in March and April 1975 with my earlier reports, are not being sent with this Report.

2. DEVELOPMENTS IN THE STEEL SECTOR IN PERU

2.1 Introduction

Sir M. Fiennes, in his Interim Report of May 75, has given in detail the relevant techno-economic aspects of the proposed development of the Steel Industry in Peru. I am concerned primarily with manpower planning and training for the steel industry in Peru. Hence, it is not necessary that I include in this report, these details, except in so far as they relate to my area of work. In this section, I have therefore given a brief account of the developments to make a reading of the remaining sections more understandable, as well as make this report self-contained and complete.

2.2 The Nazca Project and Induperu

Induperu, a Government of Peru undertaking, had made, at the request of the Government, preliminary studies for establishing a steel-works in the NAZCA region about 500 Km. south of Lima. The locations proposed are close to Peru's Marcona iron ore deposits. The basis of the pre-feasibility study was the production of semi-finished steel in the form of slabs and billets for export, thus adding higher value content to Peru's ferrous resources, currently being sold as pellets and ferrous concentrates.

In 1972, Induperu commissioned Atkins Planning of England, to make a long-range market study for Peruvian steel both

for internal consumption and for export. In 1973 and 1974, Induperu commissioned two feasibility studies of the Nazca Scheme, using the Atkins Market Study as a base.

One study was by Tiajpromexport (TPE) of Moscow, USSR. My comments and detailed estimates of manpower requirements were sent to UNIDO in Vienna in April 1975. As a part of their contract, a Russian team of TPE spent one month in June 1975 with Induperu, for final discussions, explanations and further clarifications where necessary. I had two sessions with them on Personnel and Training, during which I discussed my analysis and detailed estimates, as well as my plans for recruitment and training. They were in full agreement with my analysis of requirements, as well as my proposed plan of action.

The second study was by a consortium, viz. Bufete Industrial (of Mexico), Arthur G. McKee (of Cleveland, Ohio, USA) and Motlima Consultores S.A. of Lima, Peru. My comments on personnel have been given to Induperu. A copy is enclosed with this report as ENCLOSURE I.

2.3 Siderperu and Chimbote Works

The only steel producer in Peru, is at Chimbote about 450 Km. north of Lima. It was started in the 1950's primarily as an electric smelting plant using iron ore shipped from Marcona about 500 Km. south of Lima. In the late 1960's the plant was taken over by the Government, and a new en-

terprise - SIDERPERU - was formed to operate it. It was expanded and the process route and products changed. The expanded plant suffered several set-backs, and only in 1974 was it able to reach its rated capacity of 450,000 tons of liquid steel a year. The main units of the plant are:

1 - 5 metre hearth Blast Furnace, operating on Marcona ore pellets and imported coke.
2 - 30 ton Electric Arc Furnaces, operating to a large extent on imported scrap
2 - 30 ton Basic Oxygen Furnaces, with continuous billet caster
1 - Combination Merchant Bar and Rod Mill,
1 - 100" wide 2 - High / 4 - High Combination Breakdown and Plate Mill (Dúo-Cuarto),
1 - 54" Steckel Reversing Hot Strip Mill.
1 - Pickle Line,
1 - Reversing Cold Reduction Mill, with Skin-Pass Mill,
1 - Batch Annealing Plant,
Cut-up lines and Galvanizing Line.

The "Dúo-Cuarto", in its 2 - High configuration rolls 7 1/2 ton ingots into slabs; and as a 4 - High, it either rolls these slabs into plates, or slabs into breakdowns for the Steckel Mill, which rolls them into hot rolled strip (coils).

Growing output revealed bottle-necks, and the company decided on a "Balancing Project" which would not only re -

lieve the bottlenecks, but also marginally raise production to 700,000 tons of liquid steel per year. Siderperu, with the assistance of SOFRESID, their French consultants, have now prepared detailed project reports for an expansion of the plant as follows:

a) Phase A of expansion, to reach a capacity of 1'550,000 tons/year by 1979; and
b) Phase B of expansion, to reach a capacity of 2'350,000 tons/year by 1984.

The plans envisage extensive changes more akin to building a new integrated steel plant.

2.4 Demand Forecasts

A reference has been made to the long-range market study for Peruvian steel, made by Atkins Planning of England. Siderperu in preparing their Project Report for expansion made their own domestic market forecast (August 1974). The "Plan de Desarrollo Siderúrgico Nacional" (PSN) issued by the Ministry of Industry in July 1974, made three forecasts of internal demand - "conservative", "probable" and "optimistic".

In summary, the liquid steel forecasts for 1988 are:

a) A.G. McKee (viz Atkins Planning less foundry iron) 2.025 million tons per year

b) Siderperu		2.215
c) P.S.N.	- conservative	2.95
	probable	3.40
	optimistic	4.03

(a) and (b) show tolerable agreement, and (c) has been found to have a technical discrepancy. It is not my intention to go into the correctness or otherwise of these forecasts. Sir Maurice Fiennes in his report has dealt with this aspect extensively in his report. It appears however, that a case exists for expansion of the steel making capacity in Peru by about 2 million tons of liquid steel per year, and on this basis, both McKee's and the Russian Consultants, have prepared their feasibility studies for a 2 million ton integrated steel plant. Siderperu's project report also envisages an expansion by 2 million tons per year.

3. MANPOWER REQUIREMENTS

3.1 Categorisation for the purposes of recruitment and training

In a project of this type, involving the recruitment and training of several thousand persons, it is necessary to form broad categories or occupational levels, specifying qualifications, skills, experience, etc. desirable for each level, based on the human resources position in the country. It is also necessary to analyse the requirements in terms of these categories initially on a broad basis for the purpose of recruitment, location of training facilities and initial training. In the next stage, the specialised skills and knowledge requirements are determined based on equipment running, so as to draw up training programmes for individual positions and arrange for the required training.

The broad job classifications or categories I have prepared are given below. The qualifications, experience and skills desirable have been indicated in my earlier reports.

1. Senior Supervisors

   Assistant general foreman, general foreman, Assistant Head of the Department and above, and of equivalent rank.

2. Junior Supervisors

   Young Graduates with professional qualifications who will occupy Junior Supervisory positions, like fore-

man, Assistant Foreman, Technician and equivalent designations.

3. Senior Operatives

Those who are in charge of operation of the processes at a senior level, and different from maintenance personnel.

4. Junior Operatives

Those required to perform operation jobs of a less-skilled nature (excluding maintenance work), and who are next in line to senior operatives.

5. Skilled Workers

These are persons working in the repair shops or departmental maintenance, having high skills in various shops and maintenance trades.

6. Semi-skilled Workers

Men engaged in maintenance work assisting the skilled workers.

3.2 Broad Estimates of manpower requirements - Nazca Project

I give below broad estimates of manpower requirements for the Nazca Project based on my analysis.

a) Senior Supervisors
b) Junior Supervisors / Technicians

Profession or Discipline	WORKERS REQUIRED (a) Senior Supervisor UNIVERSITY	(b) Jr. Sup./Technician POLYTECHNIC
Metallurgy	116	145
Mechanical Engr.	98	108
Electrical Engr.	43	54
Chemical Engr.	10	14
Refractories	17	17
Instrumentation	16	20
Fuel Technology	7	9
Civil Engineering	7	11
Telecommunication	6	6
Computer Science	31	7
	351	391

c) Senior Operatives

Metallurgy from Polytechnic or Pure Science Degree (with Physics Chemistry and Mathematics)	1449

d) Junior Opertatives

2 years course in Science, at University or Polytechnic, or Colegio Regional (after Secondary School)	450

e) Skilled workers (for maintenance and repair shops)
High School General (with Science)
or High School Industrial or
Approved Apprenticeship in required trades 958

f) Semi-skilled craftsmen 526

GRAND TOTAL 4125

3.3 Broad Estimates of manpower requirements - Chimbote Expansion

This is a rough estimate. Exact figures will be available from the Siderperu Report. However, these figures will suffice to indicate the magnitude in terms of numbers to be trained, and the requirements of personnel with professional qualifications etc.

a) Senior Supervisors

with University degree or
equivalent in various technical disciplines 466

b) Junior Supervisor / Technicians

with Polytechnic education or equivalent in
various technical disciplines 524

c) Senior Operatives

with Polytechnic qualification in Metallurgy,
or Science Degree (with Physics, Chemistry and
Maths) or equivalent 1990

d) Junior Operatives

with 2 years Science Course in University or
Colegio Regional (after Secondary School) or
equivalent 604

e) Skilled Workers (for maintenance and repair shops)

High School General (with Science) or High
School (industrial)
or

	approved Apprenticeship in required trades	1264
f)	Semi-skilled Workers (for maintenance)	764
	GRAND TOTAL	5549

3.4 Observations

A final decision on whether to expend Chimbote or build a new steel plant in the Nazca region, has not yet been taken by the Government.

But, whatever the decision, action has to be taken right now in regard to manpower planning and training of personnel for steel plant operation and maintenance. According to present estimates, in either case, the number of persons to be trained would be of a high order

- about 5,500 for the Chimbote expansion, or
- about 4,500 for the Nazca project.

If the National forecast for steel demand is accepted, the Chimbote expansion will not be able to cater to this demand, and another plant, probably in Nazca will have to be started in 1979 or 1980, necessitating the training of an additional 4,500 persons to be in position by 1985.

4. A NATIONAL TRAINING STRATEGY AND ACTION PLAN

4.1 Availability of personnel for training

In industrially developed countries, for any industrial project, quite a large number of the required work-force can be obtained readily from the market. The educational system, both vocational and professional, is also well-geared to supply suitable men, who with the minimum amount of training, can fill various occupations at the required levels. In a developing country, the situation is different in regard to ready availability of industrial personnel for steel plant training and employment. From a quick survey I have made, I estimate that as much as 80% of the total trained work-force of about 5000 required for the steel sector expansion, will have to be the fresh output of the educational, vocational and professional institutions in the country.

On a preliminary analysis made by me, I find that at present, not enough young men are coming out of vocational schools and professional institutions, within the required time-scale, and with educational preparation suitable for steel plant training. The facilities for such education are inadequate, and not in the required disciplines. Even if the facilities existed, there are not enough qualified people to teach them.

This situation has to be remedied immediately, by increasing and improving facilities, organising and conducting

specialised and accelerated courses, diverting students to the required disciplines etc. The time-element is important, as the fresh output from vocational and academic institutions require a longer and more intensive training duration than those with some industrial work experience.

4.2 Facilities for training

In regard to training, from the mid-fifty's to mid-60's, we in India were confronted with a similar problem, when the Government of India decided on the construction of 3 integrated steel plants more or less simultaneously. However, we had reasonably sufficient young men studying in vocational and professional institutions to select from, and to be trained and employed. I was closely connected with the Government's plans for training the large number of engineers, technicians, operators and skilled maintenance men that were required. All the training resources of industry in the country were mobilised, since the steel sector in the country was very small - the 1 million ton plant of Tata Steel, and the 1/4 million ton plant of Indian Iron and Steel Co., both privately owned steel plants. I was at that time the assistant head of the Training department of Tata Steel, and over a period of years we trained over 2000 persons for Hindustan Steel Ltd., the Government-owned steel industry. This number was however only a small fraction of the 18,000 odd men that were required for the 3 steel plants.

We will have to attack the problem of training here in Peru in a similar fashion, and I envisage the following five

main sources for training of about 5000 personnel that will be required for manning skilled and supervisory positions.

i) Training in the existing steel plant.
ii) Training in related and other industrial establishments, factories in Peru
iii) Training of craftsmen in vocational training centres
iv) Training abroad for a limited number of key personnel, in steel plants, and factories of equipment suppliers.
v) Training at the plant during construction, erection, trial runs and operation, after some initial training earlier.

4.3 Planning in depth

It is obvious that the present 450,000 ton plant, can only contribute a little to this problem. A massive training programme in depth would have to be planned, and early and vigorous action taken, backed by substantial resources. Since the ultimate responsibility would be that of Siderperu in implementation and action, its training department would have to be strengthened and reorganised. The Ministry of Industry and Tourism requested me to recommend an overall Training Plan for the whole Peruvian Iron and Steel Industry, based on my discussions with them. The plan should take care of the industry's current and future needs, and I should include in it my recommendations for the training of personnel for the Chimbote expansion, with the Nazca project fitting into

this overall plan. I was also requested to suggest measures for ensuring the availability of persons with the necessary educational, vocational and professional preparation, for being selected and trained for steel plant work.

4.4 A National Training Strategy and Action Plan

I gave this matter a great deal of thought. In view of the urgency of the situation, I did not want to prepare a voluminous Report which would adorn one of the shelves in the offices. Action was needed, and immediately. I therefore prepared a recommended National Training Strategy and Action Plan (for the steel sector), highlighting the problems and what needs to be done. Implementation could be done in stages to ensure meeting the steel industry's current needs, and the needs of the proposed expansion of steel making capacity in the country. I submitted this brief report to the Ministry towards the end of April 1975.

ENCLOSURE II is a copy of the National Training Strategy and Action plan I have recommended.

4.5 Reaction

I am pleased to state that the strategy and Action I have proposed, has been broadly approved by the Government and Siderperu, and I have been requested by the authorities to advise and help in implementing the various proposals.

5. A TRAINING PLAN FOR SIDERPERU

5.1 The role of Chimbote Works of Siderperu

One of my important recommendations was the need of a "Comprehensive Training Activity at Chimbote" (see recommendation 5, page 5, of the National Training Strategy and Action Plan). In any plan for the training of steel plant personnel, the Chimbote plant of Siderperu would have to bear a major portion of the responsibility and the work involved. In the first place though small, it is the only steel plant in Peru. Secondly, Siderperu has been charged with responsibility of managing and operating the steel industry in the country. It's department of training would therefore have to be re-organised, expanded and strengthened to take up this responsibility.

5.2 Outline of a Training Plan

One of my proposals immediately taken up by the Ministry of Industries and Tourism and Siderperu, was that for strengthening the training department of Chimbote Works. I was requested to suggest suitable measures to assist the training department in this task, and recommend a Training Plan for SIDERPERU. Based on a study made earlier during a visit to Chimbote in March 75, and the over all assessment I had made since, of the training needs of the steel industry in the country, I prepared a 2 page Outline of a Training Plan for Chimbote. See ENCLOSURE III.

The implementation of any proposals can only be done with the cooperation and assistance of the existing training department. To obtain this assistance and cooperation, it would be necessary first to explain the proposals, convince the director and staff of the usefulness of the proposals, get their view-points and suggestions, and finally obtain broad acceptance of recommendations.

I accordingly went to Chimbote, and had 4 days of prolonged and fruitful discussions from May 13th to 16th with the Director, Division of Development of Personnel and his staff. With an exchange of views we were able to make improvements, and come to general agreement on the main issues.

5.3 Discussions with El Comandante, Luis Cáceres Craziani, General Manager of Siderperu

Again, for any far-reaching recommendations to be implemented, the approval of top management, in this case the General Manager at Chimbote, would be necessary. I accordingly, along with the Director of Development of Personnel, had a lengthy meeting with him. We gave him a review of our findings and obtained the benefit of his views. He was quick in appraising the various proposals, and gave his general approval, requesting us to start taking action.

5.4 A Training Plan for Siderperu, Chimbote Works

I returned to Lima, and then elaborated my outline of the plan, and prepared a Report on a "Training Plan for Sider-

peru, Chimbote Works". I formally presented a copy of this Report to El Comandante, the General Manager of Siderperu, at Chimbote on June 11th 1975, and to the Director Division of Development of Personnel. I explained the contents further. The Report has been very much appreciated, and I have been requested to proceed with implementation.

On my return to Lima, I reported to UNIDO here the action taken and gave a copy of the Report to Mr. P. Cuevas-Cancino, Sr. Technical Field Advisor. I also reported to the Ministry of Industries and Tourism, and handed over copies of the Report to Ingº Magdalena Fajardo de Savaraín, Dirección de Cooperación Técnica, and Sir Maurice Fiennes.

A copy of this Report on a "Training Plan for Siderperu, Chimbote Works" is enclosed as ENCLOSURE IV.

5.5 Implementation

In preparing this Training Plan, the focus has been on action. The recommendations made are not in chronological order in terms of action to be taken; nor is it suggested that all facilities be installed before a start is made on implementation. Some activities can be taken up immediately. Others can be progressively implemented as facilities are installed, programmes developed, staff trained and appointed, so that in a few years, the Division will be fully equipped and staffed to carry out all

steel training and development activities.

With the G. M's concerned and dedicated interest in the training and development of personnel, and the high calibre of staff he has in his present Dirección del Desarrollo del Personal, backed by adequate resources, and the cooperation and determination of Siderperu's management, it will not be difficult to implement the various proposals and produce a strong steel cadre, capable of operating a modern integrated steel plant.

Formal approval for all the recommendations is yet to be obtained, but I have been requested to proceed with implementation. This is being done, and separate approval is being taken as specific proposals are taken up.

6. PRESENT COURSE OF ACTION

6.1 The need for urgency

Since I would have to advise on the training of project personnel for the Nazca project, and this project was in the study stage, I felt initially that my arrival here was premature. But I soon realised, that the conditions in Peru were peculiar in regard to human resources and their training, presenting a more complex situation, which has been explained earlier in this report. Such problems have been confronted in the past, and with a well-worked out plan, and given good determination and adequate resources, it can be done here.

I feel that I have not come a day too early, considering the amount of work to be done, and the time taken in co-ordinating the different areas involved. Considerable time is taken in knocking at the doors of the various Ministries connected with manpower development - Industry, Education and Labour - and as is natural, things move slowly due to procedural bottlenecks. But there has been considerable enthusiasm and cooperation and a realisation of the existing gaps, and the Government is taking steps to bridge these gaps.

6.2 Procedure being followed

In a situation like this, where something has to be done on various fronts, it is not possible to select a parti-

cular recommendation and follow it up to fruition, before moving on to the next, much as one would like to. I have therefore been working on separate issues simultaneously, and getting the officers concerned involved intimately, for follow-up action. In doing so, I am sure I will be able to pass on the knowledge and experience I have in this field to those working with me.

6.3 Work in hand at present

In line with what I have mentioned earlier, I am at present working simultaneously on serveral jobs. In this report, I will only list them, and will report periodically to headquarters. Regular and frequent reports are however being made by me to the Sr. Technical Field Advisor here and his assistance asked for when needed.

1. Availability of men for training

I have been visiting various Vocational training Centres, Polytechnics and Engineering Universities, to assess the physical facilities they have, their enrolment pattern in various disciplines, the possibility of introducing disciplines required by the steel industry etc. The study so far reveals that there are insufficient facilities for metallurgical education, and even where this discipline exists, the number enrolled is much too small. I feel that UNIDO and UNESCO will have to come to their rescue, in making available equipment and laboratories

for giving metallurgical or steel technology education, both at the University and Polytechnic level. The same situation applies to vocational training centres, from where we should normally obtain the bulk of our maintenance craftsmen. A glaring deficiency is the absence of such a technical training workshop at the Chimbote Works.

My proposals in these areas are being discussed with Mr. P. Cuevas-Cancino here, and he will process them for assistance from UNIDO and UNESCO, after we discuss them here.

We are also conducting an inventory of surplus personnel in the existing steel plant at Chimbote, to identify the number and the men who would be available for further training and deployment to the new facilities.

2. Locating training facilities

a) Training abroad

I have made a review of Siderperu's identification of key positions for training abroad, and my comments are being given in ENCLOSURE V. The figure of 434 out of a total of 5549 persons required seems to be in order, but I am scrutinising it further, to see whether it can be reduced, since the cost involved is of the order of $ 5.5 million. The Govt. of Peru will have to seek assistance from other

Governments to help them in this national task, as well as seek the assistance of U.N. agencies.

b) Training in other industries in Peru

A team consisting of the Director of Development of Personnel Siderperu, a representative of the Ministry of Industries and Tourism, and myself is visiting the various industries in the country, to locate training facilities, determine the number of men that can be accepted for training in dif - ferent skills, specialities etc. This survey, will not only help the steel sector, but also the Govern ment of Peru in its other programmes for industrial development. The response so far has been good.

c) Training at Chimbote Works

Programmes of training are being initiated, to enable as a large a number as possible to be trained at the existing Chimbote works.

3. Strengthening the Training department of Siderperu

A reference has already been made to the Report submit ted. Action has been initiated on the following recom mendations.

a) Manpower planning. An inventory card has been designed by me for use. The card is to be used more

for a survey of the existing human resources of the plant, the availability of persons for movement horizontally and vertically, the training needs of the plant, identification of personnel suitable for further development etc. The essential information from these cards will be computerised.

b) Training for expansion. The staff of this section have been instructed on how to make a detailed analysis of expansion requirements, according to the equipment manning lists given in the Project Reports. This work is on hand, and will be ready in a month's time for being matched with the availability of men and training facilities, which are being studied separately.

c) Graduate or Management Training Course. Work on developing such a course for young graduate engineers has been initiated. There is a dearth of good managerial talent to man the new facilities that will come up either at Chimbote or Nazca, and hence the need to urgently prepare a strong managerial cadre. In the next few years, we can recruit and train each year, a batch of 15 to 20. The duration of training I envisage will be about 1 1/2 years for this category of personnel.

d) Professional development of existing supervisors and future supervisors

In the past people have been promoted from the ranks without paying sufficient attention to the incumbents' professional knowledge and competence. A great deal of future training will have to be on-the job, imparted by line supervisors. There is a need therefore to up-date and up-grade their profes sional knowledge. Work has been initiated on start ing knowledge-based part-time courses in various specialities.

4. Recruitment and Training of personnel for steel expansion

a) Establishing minimum standards for recruitment

For recruiting suitable persons for training, it will be necessary to lay down minimum standards of academic/professional educatien, duration and nature of experience age etc, based on equipment manning schedules. These standards are necessary for the purpose of advertisement and recruitment.

Work is in progress in this area. Suitable advertisements are being drafted, based on the situation in the country, and these will be used through the medium of mass communication in the country to attract the best talent in the country for steel plant training.

b) Detailed training programmes

Based on the estimates of manpower for various units, I am assisting the staff of Siderperu Training Department in preparing detailed training programmes, which will be used for imparting training in the various locations now being studied. These will be specialised training programmes for specific positions and posts.

7. CONCLUSION

7.1 In conclusion, I would like to say that, though I have been simultaneously connected with INDUPERU, SIDERPERU and the MINISTRY OF INDUSTRIES and TOURISM, I have received excellent cooperation from all their officers I have worked with. They are as keen as I am, in seeing that the country's steel expansion programme does not suffer from lack of trained manpower. The training of personnel, fresh from academic institutions, to man a steel plant, takes longer than actual construction and erection of the plant itself, and it is fortunate that a start has been made at least now.

7.2 I have mentioned earlier the need for adequate resources in terms of training abroad, setting up of facilities here, training of teachers and instructors etc. In this area, I am looking forward for assistance of UNIDO, and through UNIDO, that of UNESCO and other U.N. and Governmental agencies. The actual and specific needs will be processed through UNIDO here.

7.3 In assignments of this type where important policy decisions are delayed, there is a hold-up in progress of work of the expert. I feel particularly satisfied however, that none of my work so far has been a wasted effort. It has also been a source of encouragement to me, to find that my proposals have obtained general acceptance here. More encouraging has been the request by the Ministry and Siderperu, to help them in implementation, and their cooperation and collaboration in this task. This is a

challenging assignment, and with the cooperation and assistance of all concerned, I trust I will be able to contribute to the maximum in manpower planning and training for the steel sector in Peru.

7.4 This Interim Report (Half-yearly) and the five enclosures, contain a lot of reading material. Nevertheless, I look forward to the comments and suggestions from headquarters staff to assist me in this assignment.

ENCLOSURE I

INDUPERU

THE PERUVIAN IRON AND STEEL INDUSTRY

A NATIONAL TRAINING STRATEGY

and

ACTION PLAN

- Ingº Benedit Fernandez
Asesor de ONUDI

THE PERUVIAN IRON AND STEEL INDUSTRY

A NATIONAL TRAINING STRATEGY

I. OBSERVATIONS

1. Based on demand forecasts, the Government of Peru has decided on the expansion of its steel-making capacity from the present 450000 tons/year to about 2.4 million ton by 1982/1983. Two proposals are under consideration:

   a) to expand the present Chimbote plant from its present 450,000 tons/year to 2.35 million tons/year, in two stages, and maybe later if the demand for steel warrants it, to build a new steel plant in Nazca; and

   b) to build a 2 million ton integrated steel plant in the Nazca area on green field site, with a possibility of expansion to 4.00 million tons at minimal cost.

2. Whatever the decision, action has to be taken right now in regard to manpower planning and training of personnel for steel plant operation and maintenance. According to present estimates, in either case, the number of persons to be trained would be of a high order -

   - about 5,500 for the Chimbote expansion, or

   - about 4,500 for the Nazca project.

   If the National forecast for steel demand is accepted, the Chimbote expansion will not be able to cater to this demand, and another plant, probably in Nazca will have to be started in 1979 or 1980, necessitating the training of an additional 4,500 persons to be in position by 1985.

3. A modern steel plant requires highly specialised operation and maintenance personnel at different levels, ranging from skilled maintenance and operation workers, to technicians, supervisors and efficient management personnel. This calls for a particular type of educational and vocational preparation, before being selected and placed on specialised training for steel plant positions. Training for positions in a steel plant is itself a long process. The duration would vary from anything like 6 months to 3 years, depending upon the educational, vocational preparation of the men, their experience

their ability to absorb training, and positions and levels for which they are being trained.

4. It will be agreed, that in Peru, at its present stage of development as far as the steel, metallurgical and engineering industries are concerned, persons with suitable qualifications related skills and experience will not be readily available for training for steel plant work. It is expected therefore, that the bulk of the men selected for training, about 80%, will have to be from the fresh output from educational, vocational and professional institutions in the country. From a cursory study of this position, it is seen, that the educational system, specially at the professional level is not geared to meet the situation.

5. The steel plant at Chimbote, being the only one in the country, and its training department, will necessarily have to take the major load in the overall training activity for steel development.

II. CONCLUSION

It will be seen from the above that immediate steps are called for to draw up a long-term strategy and action plan, in regard to manpower planning, education and training of steel plant personnel for the Peruvian Iron and Steel Industry, and the simultaneous implementation of this plan, to meet both its immediate and long-term requirements.

III. RECOMMENDED STRATEGY AND ACTION PLAN

(Note: The five major areas covered below, are not necessarily in chronological order in terms of action to be taken).

1. Detailed Estimation of Manpower Requirements

Based on the facilities to be included in the expansion of steel making capacity a detailed estimation of men required, at various levels, in different skilled trades and professional disciplines, will have to be made. The timings of these requirements depending on the construction schedule is important in order to plan recruitment and training.

2. Vocational/Professional Preparation of Manpower for Steel Training

a) Investigate enrolment, capacity, quality, outputs, etc. of the educational system with special reference to the

Industrial schools, technical training centres, Polytechnics, ESEP and Engineering University.

b) Based on this investigation, suggest measures to ensure the availability of sufficient and qualified personnel for steel plant training. Among the measures to be taken, the following maybe suggested to the authorities concerned.

- increasing seats in required disciplines
- arrenging accelerated courses in disciplines in which there is a shortage(Polytechnic,University)
- introducing special condensed steel technology courses in Polytechnics, University, etc.
- improving laboratory facilities, equipment in workshops, etc.
- guiding students to enrol in courses required by the steel industry.
- indicating to industrial school, vocational training centres, SENATI, the requirements in regard to skilled trades.

3. Industrial Training for Steel Plant

a) for expansion:

i. Based on level-wise requirements in different units, draw up and prescribe standards in respect of skills, experience, educational/professional preparation, age etc, with suitable equivalents.

ii. Draw up training course outlines in terms of knowledge, skill and attitude to be acquired, the duration, and progressive evaluation of training, etc.

iii. Locate facilities for training in the country - the existing steel plant, technical training centres, allied industries, equipment suppliers, etc, and abroad - with equipment suppliers, in foreign steel plants, etc.

iv. Finalise training requests with the parties concerned including cost commitments.

v. Arrange for recruitment and selection of personnel to be trained, and plan their deputation for training in

facilities that have been identified and committed.

vi. Work out cost implications of the whole scheme

b) for present and expansion needs:

Re-organise, strenghen and introduce new facilities and programmes in the Siderperu Training Department at Chimbote. (This is spelt out in greater detail in 5 below)

c) for long-term needs

Keep ready a training organisation and project for the proposed Nazca plant, ready for implementation if and when the scheme is approved. This training activity will have to fit into the overall training plan of Siderperu.

4. Development of Steel Plant Personnel

a) Draw up a plan for the continuous training and development of existing and future steel plant personnel, for improved performance on the job, for up-dating, and for promotion and growth within the plant and within the organisation.

b) Ensure that all levels of personnel are covered, and emphasis laid on key maintenance and operation personnel.

c) Introduce and follow scientific appraisal systems for workers, supervisors and management personnel.

5. A Comprehensive Training Activity at Chimbote

Because of the vital role the department of training and development of Siderperu at Chimbote has to play, both to meet its own current needs, as well as the future needs of the steel industry in Peru, the following specific measures are suggested:

a) Structural reorganisation of the department and its activities, to include the new activities proposed.

b) Introduction of pre-employment training schemes for fresh recruits for injection at selected and strategic levels.

c) Review, and introduction of new courses for the development of existing employees, both workers and supervisors, with emphasis on acquiring skills.

d) Establishment of a training shop or Institute for imparting practical training to fresh recruits and improving the practical skills of existing maintenance workers

e) Introduction of an In-plant training service.

f) Budgetary arrangements and control for conducting approved departmental activities.

IV. MANPOWER PLANNING, EDUCATION, TRAINING and DEVELOPMENT FOR THE STEEL SECTOR IN PERU

A country sets before it national targets for outputs in various sectors of the economy, to meet its social, cultural, economic and political goals for the overall benefit of its people. A chain of relationships connects production with the educational and training requirements of the human resources it employs, as follows:

industrial composition of output
↓
industrial structure of employment
↓
occupational composition of employment
↓
training requirements
↓
qualifications in terms of educational preparation

These relationships are not clear, stable or well-defined; they vary from country to country and with time. It is therefore necessary to consider each link in the chain to the extent possible, and according to the conditions in the country concerned.

V. A GRAPHICAL REPRESENTATION

An attempt has been made in the attached chart to give a graphical representation of this process, as far as the steel sector in Peru is concerned.

APPENDIX I

SUMMARY REQUIREMENTS OF MANPOWER, HAZCA STEEL PROJECT

a) Senior Supervisors

b) Junior Supervisors / Technicians

Profession or Discipline	WORKERS REQUIRED (a) Senior Supervisor UNIVERSITY	(b) Jr. Sup./ Technician POLYTECHNIC
Metallurgy	116	145
Mechanical Engr.	98	108
Electrical Engr.	43	54
Chemical Engr.	10	14
Refractories	17	17
Instrumentation	16	20
Fuel Technology	7	9
Civil Engineering	7	11
Telecommunication	6	5
Computer Science	31	7
	351	391

c) Senior Operatives

Metallurgy from Polytechnic
or
Pure Science Degree (with Physics Chemistry and Mathematics) 1449

d) Junior Operatives

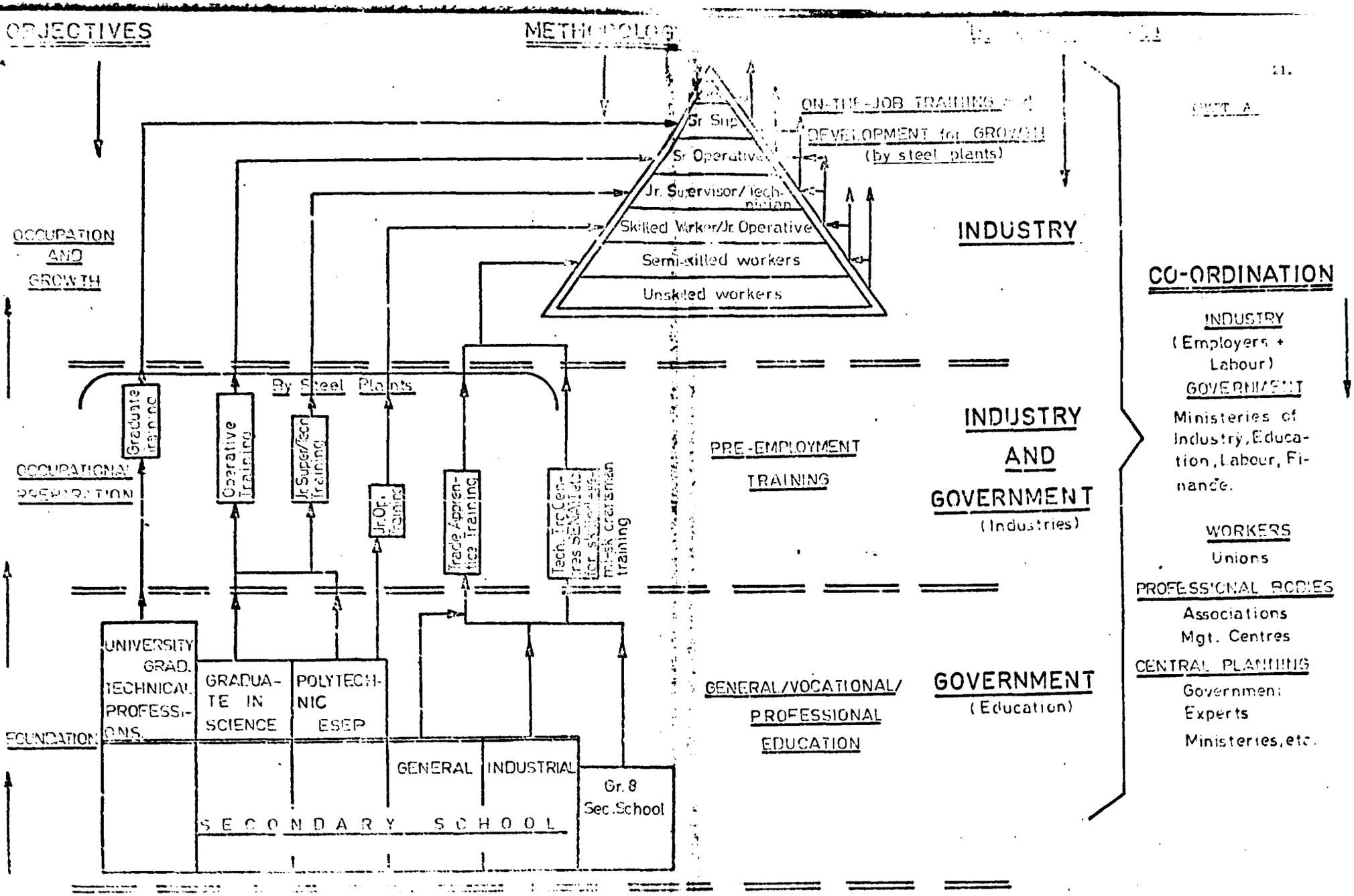
2 years course in Science, at University or Polytechnic, or Colegio Regional (after Secondary School) 450

e) Skilled workers (for maintenance and repair shops)
High School General (with Science) or High School Industrial or Approved Apprenticeship in required trades 958

f) Semi-skilled craftsmen 526

GRAND TOTAL 4124

ANNEX A



MANPOWER PLANNING, EDUCATION, TRAINING AND [illegible] STEEL SECTOR

ENCLOSURE II

INDUPERU

THE NAZCA IRON AND STEEL PROJECT

Comments on the Personnel Requirements aspect of McKee's Report N°2, April 1975.

- B. L. FERNANDEZ

PERSONNEL

1. TOTAL MANPOWER REQUIREMENTS ESTIMATED

1.1. McKee's in their report have correctly stated that the manning schedules indicated in their report for the various facilities proposed, are subject to review and adjustment. This review will be necessary to suit changed conditions which may be developed during final design engineering.

1.2 The estimate of manpower requirements have first been worked out on a U.S.A. basis. Then in order to compensate for the lower degree of productivity in developing countries due to various factors, a multiplying factor of 1.8 has been used to work out the manpower needed for the Nazca project. While the basis for arriving at the figure of 1.8 is not known, the final totals for major departments, and the works as a whole, are figures which can be reasonably accepted for an integrated steel plant of this size.

1.3 The total as per McKee's report comes to 5030. From a scrutiny of the details, it appears that some facilities seem to be over-manned, while others seem to have less men than required. Some major facilities have not been listed separately. It is not clear whether they have been included in the other major facilities. The highest figure in the Russian report is 5398, but they have not provided for the "Yards and Docks" facilities included by McKee's in their report.

1.4 Taking the above factors into consideration, it is reasonable to assume a total manpower requirement of 5500 for plant operation and maintenance.

2. FACILITY-WISE SUMMARY ESTIMATES

2.1 In reproducing below the figures given by McKee, the multiplying factor of 1.8 assumed earlier, has been used. It leads to a more realistic total number, as well as for the major facilities. It is obvious that this factor cannot be used for all levels of personnel, but as an average for the purpose of estimation it suffices, and assists in framing an overall plan for recruitment and training.

2.2 Summary estimates

Function	Number of employees
Plant Administration and Technical Services	820
Coke plant	280
Blast furnace	207
Steel making and Continuous casting	810
Hot strip and Plate mill	343
Central Maintenance	1030
Yards and Docks	910
Utilities and Oxygen plant	171
Services	459
	5030

Peruvian Basis including all allowances for holidays, leave, off, absenteeism, continuous operation, productivity, etc.

2.3 While it is agreed that departmental manpower requirements depend on the equipment and processes etc, in the author's opinion, the following facilities seem to be under-manned. For a comparison, the Russian figures for their facilities are given alongside:

	McKee	Russian
Continuous casting	326	374
Laboratories	183	484
Power plant, turbo-blower house and oxygen facilities	262	511

2.4 Similarly, the following facilities seem to be over-manned, if the multiplying factor is applied. McKee's have included in their Plant Administration and Technical Services, Production and Maintenance management, Marketing, Engineering and Construction.

	McKee	Russian
Central Maintenance (Repair Shops)	1023	821
Services	640	227

2.5 No manpower estimates seem to be included for the following functions:

Electrics of Power Complex
Power distribution system
Site water supply and sewerage
Gas facilities

It is not clear whether they have been included in other activities shown.

2.6 For the purpose of drawing up a plan of recruitment and training for the production units, the estimates given will be helpful. More detailed figures however will be required to assess the knowledge and skill requirements for various levels, in order to arrange for training in Peru. Key personnel for being trained abroad in steel plants and with equipment suppliers and manufacterers, can be assessed from the manpower estimates given by McKee.

3. JOB CLASSIFICATIONS AND EDUCATIONAL LEVELS

3.1 McKees's have indicated in paragraph15.3, a preliminary analysis of job classifications and educational levels. While this may be in order under conditions in the U.S.A., it will not be appropriate for a developing country. Peru still lacks the industrial culture and environment necessary to give persons the background and aptitude to assimilate quickly the technology and skills required for steel plant operation and maintenance. Further, with the sophisticated technology and equipment proposed in their study, there is an imperative need that the persons selected for steel plant training and employment, possess the educational/vocational/professional preparation in relevant areas.

3.2 Jobs classifications.

Since it is known that trained and experienced personnel will not be readily available form the market, the bulk of persons selected will have to be specially trained for steel plant work. For the purpose of initial training, the following job classifications are more appropriate:

1. Senior Supervisors

Assistant general foreman, general foreman, Assistant Head of the Department and above, and of equivalent rank.

2. Junior Supervisors

Young Graduates with professional qualifications who will occupy Junior Supervisory positions, like foreman Assistant Foreman, Technician and equivalent designations.

3. Senior Operatives

Those who are in charge of operation of the processes at a senior level, and different from maintenance personnel.

4. Junior Operatives

Those required to perform operation jobs of a less-skilled nature (excluding maintenance work), and who are next in line to senior operatives.

5. Skilled Workers

These are persons working in the repair shops or departmental maintenance, having high skills in various shops and maintenance trades.

6. Semi-skilled Workers

Men engaged in maintenance work assisting the skilled workers.

3.3. Education levels, experience, etc.
Based on the pattern of general and technical education in the country, the following educational levels etc, are more appropiate for Peru, than those indicated by McKee's:

Senior Supervisors

Age	:	30 to 40 years depending on position for which recruited
Qualifications	:	University degree in Engineering or Metallurgy
Experience	:	AGF and GF - 5 years to 10 years, and Asst. Supdt and Supdt more than 10 yrs,

in a steel plant in a relevant supervisory or managerial position, preferably in the area of speciality.

Junior Supervisor

Age: 22 to 30 years
Qualifications and Experience
1) University Degree in Engineering and Metallurgy without any experience, but specially trained for steel plant position.
or
2) 2 to 3 years professional course in a technical discipline in a Polytechnic or "Nivel Intermedio" institution or equivalente; and

3 years experience in heavy industry or a steel plant.

Senior Operative

Age: 27 to 35 years
Qualifications and experience
1) 2 to 3 years professional course in Metallurgy in a "Polytechnic" or "Nivel Intermedio" institution or equivalent or Graduate in Science (with Physics, Chemistry and Mathematics); and

3 years experience in heavy industry or steel plant
or
2) Secondary Industrial School; and
5 years experience in metal industry
or
3) SENATI Apprenticeship or equivalent in metal trade; and 4 years experience in metal industry
4) Secondary School General; and
7 years experience in appropriate steel plant area

Junior Operative

Age : 21 to 27 years
Qualifications and experience
1) 2 to 3 years professional course in Metallurgy in a "Polytechnic" or "Nivel Intermedio" institute, or equivalent; and
1 year experience in heavy industry or steel plant
or
2) Secondary School Industrial; and
3 years experience in metal industry
or
3) SENATI Apprenticeship or equivalent in metal trade; and
2 years experience in steel plant or heavy industry
or
4) Secondary School General; and
5 years experience in appropriate steel plant area.

Skilled Workers

Age : up to 40 years
Qualifications and experience
1) Industrial Secondary School; and
3 years experience as a skilled craftsman in the trade concerned.
2) SENATI Apprenticeship; and craftsman in the trade concerned
2 years experience as a
3) 3 years Apprenticeship specially for steel plant with on-the-job training in a steel plant.

4. AVAILABILITY AND PERSONNEL PROCUREMENT

4.1 McKee's have assumed that the new steel plant will employ for its technological and administrative functions, Peruvian University graduates and technically trained personnel of other Latin American Steel companies. As far as is known, the objective will be to employ only Peruvian citizens and any foreign personnel employed will be limited and only under Technical Assistance schemes for specific durations until their Peruvian counterparts acquire the necessary know-how and skills. In regard to the ready availability of skilled tradesmen in Peru, this is again a moot point.

4.2 In view of this, the bulk of the manpower required will have to be the fresh output from the educational system in the country, who will have to be given intensive training for relatively long periods, even before being allowed to participate in the various phases of engineering, construction and erection, and being given possible job assignments

4.3 In view of the lack of sufficient people with adequate professional preparation , particularly for Technician/ Junior Supervisory positions and above, classroom training will have to start much in advance, and later specific class-room instruction for the relevant jobs, given by supervisors in each department.

5. TRAINING PROGRAMMES

5.1 McKee's have very briefly indicated some of the methods that might be adopted for imparting training to prospective steel plant employees. All these methods will have to be used, as well as new methods devised, to enable us to get the large complement of trained work-force necessary.

5.2 The tentative training programme indicated for various plant personnel, gives broad indications of areas of training and durations. These will have to be worked out in greater detail, depending on the educational qualifications, skills and experience of the men available and selected for steel plant positions.

5.3 Because of the magnitude of the job, and the prevailing conditions in Peru, manpower planning, education and training of personnel for the new steel plant, have to be dealt with on an urgent basis, taking all factors into consideration. An assessment of the availability of personnel and facilities for training must start right now, and actual work on training will have to commence at least when the decision is taken to proceed with the project.

5.4 The training and development of personnel, as has been rightly mentioned by McKee, will have to continue until the satisfactory production and sales goals are met.

6. TECHNICAL ASSISTANCE

6.1 As stated by McKee, it will be necessary in Peru, to retain the services of technical consultants, qualified to act on behalf of the Peruvian owners. The appointment of one firm of consultants to advise the owners, and be in overall charge of co-ordinating, engineering and reviewing the work of various sub-contractors, would be the best arrangement from all points of view.

6.2 In the matter of personnel training, particularly abroad, and during design, construction and erection activities, such a consulting firm would be of great assistance in securing training facilities and making available the best training to the future steel plant personnel.

5.3 Technical assistance arrangements in respect of training of personnel to be negotiated and settled satisfactorily should include:

a) The training of an adequate number of key personnel by steel firms and equipment suppliers, abroad and during construction, prior to start-up of operation and production.

b) The retention of a selected number of foreign key personnel for varying durations after start-up, for among other things, imparting the technical know-how

and skills to their Peruvian counter-parts.

6.4 6.3 (a) and 6.3 (b) above should be negotiated separately with the firms concerned and the overall Consultants, and entered into the contracts. This is necessary to achieve the proper training of Peruvian personnel and a smooth transition when the Peru owners take complete responsibility for administration, management and operation of the new steel plant.

6.5 From their experience, McKee's have quoted a period of 2 years after start-up when 75% capacity is achieved; 3 years to achieve 95% and 4 years for 100% capacity production. It would be expected therefore that the foreign key personnel listed should have normally a 4 year (48 months) assignment in Peru.

6.6. It is felt, that a few more foreign key personnel at the senior operative level would be necessary to retain, for the production departments, for periods upto ? years, viz - Coke Plant, Blast Furnaces, B.O.F. Plant, Continuous Casting Plant, and Hot Strip and Plate Mill.

ENCLOSURE III

OUTLINE OF

A TRAINING PLAN FOR SIDERPERU, CHIMBOTE

Siderperu has a "Dirección de Desarrollo del Personal" in Chimbote, which is carrying out several activities in the area of training and development. There is a need however for establishing an overall Training Plan to meet current and long-term needs of the company for the preparation of personnel for non-management and management jobs, and their development and advancement to levels of higher performance and responsibility. The Training Plan should also be such that it will cater to the needs of personnel that will be required for the proposed expansion of the iron and steel industry in Peru.

OUTLINE OF PROPOSED WORK

1. Study of Siderperu's present Training and Development activities.
2. Analysis of the present needs of the plant, and the extent to which they are being met.
3. Introduction of new courses for
   a) Pre-employment training of fresh recruits for injection at various levels.
      1. Maintenance craftsman training
      2. Junior Supervisor/Technician training
      3. Senior and Junior Operative Training
      4. Graduate Training for senior supervision.

   b) Employee development of existing employees, both workers and supervisors, for improved performance on the job, for

up-dating and for up-grading for promotion and growth in the organization.

1. Worker-development in maintenance skills and knowledge.
2. Refresher courses for operation personnel.
3. Knowledge-based part-time courses for workers to move into supervision.
4. Supervisory development courses.
5. Training of Instructors.

4. Establishment of a Training Shop or Institute for imparting practical training to fresh recruits, and improving the practical proficiency of existing maintenance workers.

5. Introduction of an In-plant training service to co-ordinate and conduct inplant, on-the-job-training.

6. Formulation of Scientific Appraisal systems.
   a) Trade-testing for skilled worker positions
   b) Supervisory appraisal
   c) Executive appraisal

7. Budgetary Control of departmental activities.

8. Functional reorganization of the Division of Development of Personnel, with organisational structure, to meet current and future needs.

ENCLOSURE IV

UNITED NATIONS INDUSTRIAL DEVELOPMENT

ORGANISATION

REPORT

ON

A TRAINING PLAN

FOR

SIDERPERU, CHIMBOTE WORKS

by

BENEDICT L. FERNANDEZ

ONUDI CONSULTANT

JUNE, 1975

PREFACE

The Government of Peru is considering a substantial increase in steel making capacity in Peru. Even while the feasibility reports were being studied, the Government realised that staffing of the new facilities to increase the capacity in the country by about 2 million tons, would be a complex and formidable problem. Trained manpower required would be of the order of 5000, and a massive training programme in depth would have to be planned and implemented without delay. UNIDO in Peru was approached by the Government for the services of an expert or consultant, and with the concurrence of the Government of Peru, the undersigned was requested to accept this assignment.

On arrival in Lima, in February 1975, to take up this assignment, I started work with INDUPERU, who were studying the techno-economic aspects of the feasibility reports submitted by the foreign Consultant firms concerned. A detailed analysis of manpower required at different levels was prepared based on these reports. For preparing an overall training programme, it was also necessary to assess the availability of persons, with suitable educational/vocational/professional preparation for steel plant training. It was further necessary to make a survey of facilities available in the country for training, since the majority of the personnel required, would have to be trained in Peru itself. The cost of training abroad would limit the number to only certain key positions.

The undersigned thus arranged for, and had meetings and discussions with the authorities concerned in the Ministry of Industry and Tourism, the Ministry of Education and the Ministry of Labour.

Visits were paid to SENATI, which trains craftsmen in several maintenance trades, and the steel plant and training department of SIDERPERU at Chimbote. Discussions were held with INDUPERU and SIDERPERU engineers and administrators in Lima, other UNIDO experts working at the Chimbote plant, and Sir Maurice Fiennes, who is a UNIDO consultant advising the Ministry of Industry and Tourism on the strategy of developing the national steel industry.

From time to time, the undersigned had discussions with the Senior Field Advisor, and Asst. Field Advisor of UNIDO in Lima, and the Director, Cooperación Técnica y Económica Internacional of the Ministry of Industry and Tourism (M.I.T.), Lima, to brief them about my findings, and advise on problem areas. In April of 1975, at the request of MIT, I prepared and submitted an outline of a National Training Strategy and Action Plan for the Peruvian Iron and Steel Industry to take care of its current and long-term needs. This paper was based on the studies conducted so far, the discussions with the several officials mentioned earlier, and my observations of the situation in Peru in regard to manpower for the steel industry in particular.

It was pointed out that, among other things, in any plan for the training of steel plant personnel, the Chimbote plant of SIDERPERU, would naturally have to bear a major portion of the load, as it is, though small, the only steel plant in the country. Its Division of Development of Personnel, would therefore have to be strengthened to take up this responsibility. The undersigned was requested to suggest suitable measures to assist the Training Division in this task, and recommend a Training Plan for SIDERPERU, with the accent on action and implementation.

Based on my observations during my earlier visit to Chimbote, and an assessment of the training needs for the steel industry in

Peru, an outline of a Training Plan was prepared and taken to Chimbote, for further explaining the various proposals.

From May 13th to 16th, prolonged and fruitful discussions were held with Ingº I. Patron, Director, Dirección del Desarrollo del Personal, SIDERPERU and his staff at Chimbote, so that, with an exchange of views, further improvements could be made. On May 15th, Ingº I. Patron and I had a meeting with El Comandante Luis Cáceres Graziani, General Manager, SIDERPERU, to give him a preliminary review of our findings, and obtain the benefit of his views. He was quick in appraising the various proposals, and gave his general approval, with a request for action.

The undersigned has accordingly prepared this report on a "Training Plan for SIDERPERU", giving his findings and recommendations in greater detail, for an overall training activity in SIDERPERU.

In preparing this Training Plan, the focus has been on action. The recommendations made are not in chronological order in terms of action to be taken; nor is it suggested that all facilities be installed before a start is made on implementation. Some activities can be taken up immediately. Others can be progressively implemented as facilities are installed, programmes developed, staff trained and appointed, so that in a few years, the Division will be fully equiped and staffed to carry out all steel training and development activities.

I respectfully submit this report to El Comandante Luis Cáceres Graziani, General Manager of Siderperu.

With his concerned and dedicated interest in the training and development of personnel, and the high calibre of staff he has in his present Dirección Del Desarrollo del Personal, backed by adequate resources, and the cooperation and determination of Siderperu's management, it will not be difficult to implement the various proposals and produce a strong steel cadre, capable of operating a modern integrated steel plant.

I look forward to the task of assisting the staff of the Division of Training and Development in implementing approved recommendations.

I am grateful for the cooperation received from all persons I had discussions with in different quarters, which has been of immense help in formulating these proposals. I also appreciate the staff and secretarial assistance provided by INDUPERU in the preparation of this report. In particular I wish to express my appreciation for the facilities provided by Siderperu, the active and enlightened participation of Ingº L Patron in finalising the various proposals, and above all, the personal interest shown, and encouragement given by el Comandante, Luis Cáceres Graziani, General Manager of Siderperu.

Lima, Perú
June 1975

Benedict L. Fernandez
UNIDO Consultant

TABLE OF CONTENTS

SECTION I

PRESENT SIDERPERU TRAINING

1.1 INTRODUCTION

1.11 Siderperu's steel plant at Chimbote was started about 15 years ago as a mini-steel plant, with small electric furnaces. Later, about 8 years ago, new facilities were installed, to increase the capacity to produce billets and flat products. These units included a small blast furnace B.O.F. shop, continuous casting plant, streckle mill, billet mill and a Galvanising plant. The production is about 450,000 tons per year at present. A balancing programme is under way to increase the capacity to 700,000 tons/year by 1976/77.

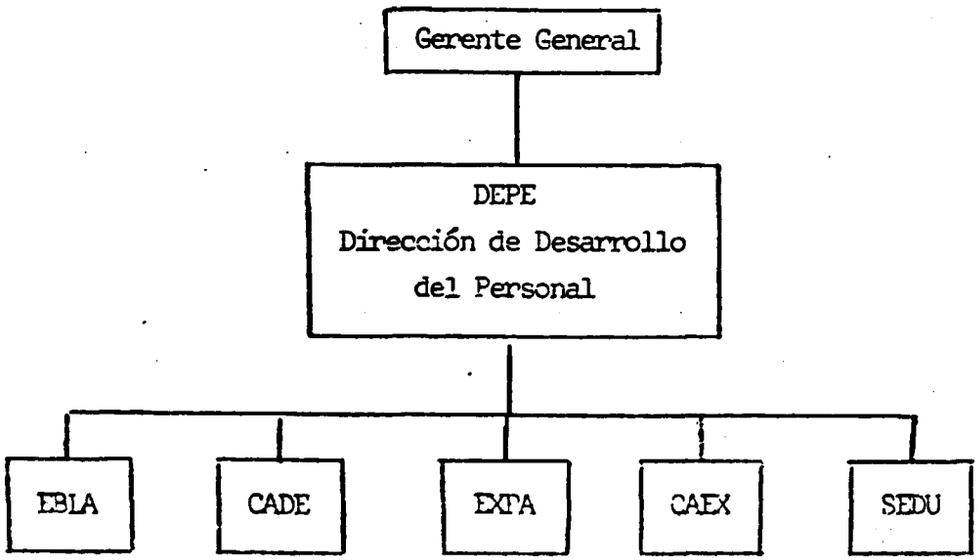
1.12 The personnel requirements were few. A number of key personnel were trained abroad, but the majority of operatives and workers, were trained in the plant, acquiring skills as they went along. The plant has a large number of surplus personnel. as can be seen from the employment figure - a work force of 4800 for a plant of approximately 1/2 million ton capacity. Initially, there seemed to have been no systematic prescribing of qualifications and skills for various posts. Also, a large number of persons rendered unemployed form the fishmeal industry in Chimbote, were given employment in the steel plant. Thus, a large number of steel plant personnel do not have adequate professional qualifications, and the literacy rate among the wor-

kers is low. This has created its own peculiar problems in personnel and manning, which the company is trying to set right.

1.13 To tackle its problems, as well as to plan for the future, Siderperu has established a "Dirección de Desarrollo del Personal" in Chimbote. The emphasis at present, is mainly in raising the basic educational levels of the workers, and conducting a few development courses for technicians and supervisors.

1.2 PRESENT ORGANISATION OF CHIMBOTE TRAINING

The following chart indicates the organisation in terms of activities presently being carried out.



EBLA Educación básica laboral
(Basic education for workers)

CADE Capacitación dentro de la Empresa
(Training within the Company)

EXPA Externa capacitación para la ampliación
(Training for expansion)

CAEX Capacitación externa
(External training)

SEDU Servicios Educativos
(Educative Services)

1.3 PRESENT SIDERPERU TRAINING AND DEVELOPMENT ACTIVITIES

1.31 EBLA - Educación básica laboral

Because of reasons stated in the introduction, and the illiteracy among the present workers of as high as 60%, Siderperu, as a policy matter, has decided that itembark on this programme of raising the educational and general standards of its workers. There are 3 such programmes:

1. Líneas Graduadas

In these courses the subjects of mathematics, social science, Natural Science and Languages are taught.

Workers can later go into Secondary School, later even take up technical courses in Polytechnics.

2. Líneas no Graduadas

In these courses, the emphasis is on the general development of the person; the areas covered are Physical education, Arts and crafts, neighbourhood promotion.

3. Formación laboral

These are basic technical and refresher courses proposed to be introduced. Practical skills and specialised knowledge on-the-job are expected to be imparted by the line-supervisors, technicians, engineers, etc.

The programme of Basic Education conducted by Siderperú was the first project of this type in Peru. A first group of 22 has just gone through Gr. V.
The standards are similar to the present school system and are recognised by the Education Ministry. Permission was originally given to conduct classes from Primary to Gr. III, but now permission has been accorded to go up to Gr. V, after which these workers can enroll in a night school for secondary education - which would take 6 years (part-time).

The minimum age for admission is 15 years. The courses are open to all workers and their families including parents. The employees of firms servicing Siderperu are also eligible. This education is given free of cost, and the expenses borne by Siderperu. The courses are

very popular; 520 enrolled in 1972, 580 in 1973, 1220 in 1974, and it is estimated that about 1500 will enroll in 1975. The drop-out is only about 20%. The courses are not only aimed at raising the educational standards of the people, but also their overall development as a citizen. Included therefore are cultural programmes, games and sports, sight-seing trips and participation in various company and community activities. There are 2 ciclos of 6 months each in a year, and in order to enable participants to attend outside their duty hours, there are 3 classes per day from 8.oo to11.00, 2:30 to 5:30, and 6:00 to 9:00 pm. The staff consists of a principal and 21 teachers (called co-ordinators) and supporting office staff.

1.32 CADE - Capacitación dentro de la empresa

This section has 4 sub-sections as follows:

i) OFTE - Technical office for planning of training
ii) CAOC - Occupational Training
iii) CATP - Technical and profesional training
iv) FORP - Vacation or Co-op training for students

1.32.1 OFTE - Planning of Training

This section makes a study of departmental problems, in as far as training needs are concerned, studies the various occupations in a department, the nature of operations, and the knowledge, skill and attitude requirements. It also makes an inventory of personnel, and then, to bridge the gap, develops training programmes - both individual and

group. The Committee that makes such studies and analyses, are line executives and supervisors assisted by personnel from CADE. The section is also responsible for evaluation of participants and courses, statistical control economic evaluation of such courses, control of costs and budgets.

1.32.2 CAOC - Occupational Training

Based on the studies made, this section is responsible, in cooperation with the line-staff for the conduct of training on the shop-floor, its programming evaluation. etc.

1.32.3 CATP - Technical and Professional training

This section is responsible for the conduct of training for professional development. Various short duration part-time courses have been developed and are being conducted at different levels, ranging from skilled workers to executives. During 1974, 3962 persons participated in the 95 courses conducted.

3 year, part-time, professional courses have also been developed in the following disciplines.

a) Metallurgy of Iron and Steel
b) Production Engineering
c) Electrical Engineering
d) Electronics
e) Administration

These have been submitted to the Ministry of Education for approval, as it is proposed, that on successful completion, students will be awarded a Bachelor's degree (equivalent to Polytechnic or ESEP). A total of 900 hours of tuition are proposed to be given in the 3 years.

No fees will be charged. Initially the courses will only be open to workers of Siderperu. Admission will be restricted to those who have graduated from the Basic Education programme, and those workers who have passed Industrial or General Secondary School. There are about 800 people with such qualifications working in Siderperu. In another 3 years about 600 more will qualify from the Company's Basic Education programme.

There are no physical facilities for conducting such technical courses. There is a propcsal to utilise the rooms, laboratories and workshops and staff of the Colegio Regional about 10 Km from Chimbote, which has a capacity of 1000 students/shift or 2000 in 2 shifts, but which presently has an enrolment of only 250-300 students.

1.32.4 FORP - Co-op Training

Not much is being done in this area, as there are not many requests for co-op training .

1.32.5 General

There is no permanent Training Advisory Committee as such, but Ad-hoc committees are formed when discussing particular problems. For the various

activities listed in this section, it is heavily understaffed. Against a requirement of 56 indicated by CADE, they have only 13 staff.

1.33 EXPA - Training for Expansion

1.33.1 Balancing and expansion

Siderperu's master plans include:

a) Balancing Scheme to raise production to 700,000 T/year by 1976 / 77;
b) Phase A of expansion to reach a capacity of 1'550,000 T/year by 1979; and
c) Phase B of expansion by 1984 to go up to a capacity of 2'350,000 T/year.

So far, only the "Balancing Scheme" has been approved by the Government, and steps are being taken for implementation.

1.33.2 Personnel requirements

For "Balancing" and "Phase A of Expansion", the engineering studies have been submitted, giving details of units to be installed, the proposed construction and erection schedules, the equipment manning, and manpower requirements. A total of 5549 additional persons will be required to be trained to man facilities to be installed for the expansion programme.

1.33.3 Arrangements being made

Pert charts are being prepared for the various units, indicating the schedule of training to be followed, both in the country and abroad. In collaboration with the plant operation staff, a list has been prepared of key positions, for which training is to be given abroad. This number is estimated to be 434, consisting of 157 Maintenance and 277 operation personnel.

Of this total of 434 key personnel, the professionals are 126 (29%) and skilled workers 308 (71%). The total cost of this foreign training is estimated at $ 5'357,335.oo.

1.33.4 Foreign training commitments.

The following commitments have been obtained: 17 in Venezuela, 7 in Canada, 11 in the U.S.A., and 11 in other Latin American countries. A high-powered Committee will select from amongst existing plant personnel, those who to be sent abroad for training as key personnel. The qualifications, experience and skill requirements have been determined by this Committee. The training programmes in foreign countries were drawn up in consultation with the Governments and compa - nies concerned. An officer of Siderperu had gone abroad earlier for this purpose.

1.34 CAEX - External Training

This section is responsible for arranging training outside of Siderperu, both in Peru and abroad. It scrutinises screens and processes all such facilities of a training and development nature. External training in this section, involves the following types:

a) Scholarships received through the Ministry
b) Training invitations by firms
c) Official missions, and special technical seminars and conferences abroad.

Based on the relative usefulness of these offers, CAEX makes the final selection in collaboration with plant executives.

Proficiency in the language of the country is necessary. Those selected, sign a contract to serve Siderperu for a period equivalent to double the period of training abroad. Trainees send monthly progress reports while abroad, and on their return, there is a close follow-up on the shop-floor. They are also required to train the persons working under them and share their knowledge with their colleagues. This follow-up is done by CAEX in close co-ordination with CADE which is in charge of in-plant training.

Siderperu, also approaches the Ministry for specific types of training scholarships required by it.

1.35 SEDU - Servicios educativos

This section looks after the dissemination of technical information to company staff, and students attached to DEPE. It has the following activities:

- Translation service, of foreign technical articles, etc.
- Technical library for journals magazines and books.
- Technical information service.
- Language courses for English and Italian
- Audio-visual aid unit, which provides such services, including P.A. equipment for meetings, conferences etc.

This section is still in the development stage and is not fully staffed or equipped.

SECTION II

COMMENTS ON PRESENT SIDERPERU TRAINING

2.1 THE ABSENCE OF PRE-EMPLOYMENT APPRENTICESHIP AND INJECTION LEVELS

Consequent on the development of steel plant technology and the mechanisation that has been introduced using complex and sophisticated equipment and machinery, there is a need for a formal apprenticeship training by the steel industry, and the injection of such trained persons at various levels in the organisation. The injection points will depend on the knowledge and skill requirements at these levels. The entrants to these apprenticeship courses, will be the fresh products of academic and professional institutions in the country. The apprenticeship programme has to be so designed as to bridge the knowledge, skill and attitude gap between that acquired in the educational system and that required at the ocupational level.

The first striking observation is the complete absence of any formal pre-employment apprenticeship for injection of properly trained personnel at pre-selected levels. A judicious combination at different levels, of freshly trained young men and men developed and promoted from down the line, gives vitality and dynamism to the organisation and the company.

2.2 IN-PLANT TRAINING SERVICE

One of the most important constituents of an effective industrial training programme, is the on-the-job or in-plant training involved. In-plant training is not only a part of the training and development of existing employees, but also of that of the fresh recruits in the pre-employment apprentice ship schemes. It is most essential that this important phase of training is scientifically and systematically carried out with the

professionalism that is called for. In Siderperu the surplus staff are being prepared for expansion. The absence of a training plan for in-plant training, and training personnel to carry out such training, is a serious deficiency which will adversely affect the effectiveness of in-plant training.

2.3 THE NEED FOR A TRAINING SHOP AND TECHNICAL INSTITUTE

Modern steel plants require high calibre maintenance personnel - both workers and supervisors. In terms of numbers today, the proportion of maintenance personnel for departmental maintenance and centralised repair services is of the order of as much as 30 to 35%. There are practical difficulties in imparting basic skills in a variety of maintenance trades, on-the-job. The most effective method is to impart such basic training in a separate well-equiped Training Shop and Institute, by qualified training staff, and follow it up by on-the-job training in the plant.

Particularly in the prevailing situation where there is lack of such training facilities in the country, it is all the more incumbent that such facilities be installed by the company. The investment though high, will be a permanent asset and will pay in the long-run. It will not only provide manpower specially trained for steel plant maintenance, but also provide facilities for training the large numbers of personnel that will be required for expansion and subsequent attrition. The absence of such facilities for updating the knowledge and skills of existing maintenance workers is already having adverse effects on general plant maintenance.

2.4 BASIC EDUCATION

There is a need, at the present time, for this activity in the Siderperu training system, both for the cultural and general development of the individual, as also for remedying the defects in, or lack of education prior to employment. It should however be understood, that this is not strictly steel plant training; the base in being prepared for future tech - nical training and development. More and more emphasis should be gradually laid on the technical and professional training and development for steel plant work.

2.5 PROFESSIONAL DEVELOPMENT OF OPERATIVES, TECHNICIANS AND SUPERVISORS

Steel plant operation training is essentially on-the-job, and it is the responsibility of plant operatives and supervisors to train the people working under them. This is only possible if the plant senior operatives and supervisors possess the technical knowledge and expertise to the extent required to impart such job training and guidance. It is imperative that a start is made immediately in developing and conducting specially designed technical refresher courses in various specialities, to update the knowledge of the present senior operatives, technicians and supervisors. A crash programme is called for, especially when we are contemplating expansion of the steel sector in the country.

2.6 APPRAISAL SYSTEMS

There is a need to draw up effective L.O.P.(" Line of Promo- tion") charts for different sections and departments, and simultaneously introduce evaluation systems for certifying

and qualifying personnel to move along such promotion and growth channels. Both in the interest of efficient plant operation and maintenance and employee motivation, this is necessary. The system should be as objective as possible, and should be followed impartially. In addition to drawing up LOP schemes, it is also necessary to have an objective trade-testing system for skilled workers, and objective appraisal systems for supervisors and executives. The absence of this is being keenly felt in deciding on selection of personnel for expansion assignments and training.

2.7 UTILISATION OF TRAINING STAFF

2.71 Training staff

The department has a fairly competent and well qualified training staff. It has the infra-structure for reorganisation and implementation of various new training activities. The existing activities will need some amount of re-grouping, giving the staff more time for the substance of training rather than its administration. There are severe shortages in certain areas, which will have to be made good, after approval of recommended schemes, and redeployment of existing staff.

2.72 Training and Development Advisory Committee

A high-powered Training Advisory Committee should be constituted to advise the top management on training and development requirements, introduction of new programmes, approval of courses and course contents, etc, and in general to discuss policy matters. Such a committee to be effective must have the General Manager or Manager (Operations) as its Chairman, 6 or 7 senior

line and staff executives as members, and the head of the training department as Secretary. Involvement of line and staff in the training activities of the company will be greatly enhanced.

2.8 BUDGET AND COST CONTROL

2.81 Expenditure on training activities

THe impression gained was that, as and when new schemes were introduced, the cost estimates had to be worked out, submitted for approval, sanction obtained, and then only could the schemes be implemented. Apart from the delay in such a procedure, an effective control on costs is difficult to maintain. An annual revenue budget sanctioned at the beginning of the year by the Board of Directors could leave the department free to concentrate on the implementation of its activities.

2.82 Financial evaluation of schemes

A great deal of time and effort seemed to be spent on the financial evaluation of a training programme. It has now been realised that training is a long-term investment in human resourses, and very seldom is it possible to evaluate it in financial terms, as one could do in the case of materials, machines and money. Often, development programmes, such as T.W.I., Human relations Skills, Communication, Basic Supervision, do not lead to immediate financial returns. The returns must be viewed from a long-term point of view and due consideration given to other beneficial effects of training and development on the overall morale of the workforce, the motivation they provide, the attraction it offers to new person

nel, the improvement in industrial relations, improved performance on the shop-floor, reduction in accidents, etc. A close financial evaluation is only possible in training courses designed to meet very specific and limited objectives.

2.83 Budgetary control

Based on the Company training policy, and the approval of training and development activities on an annual basis, the department should work within an annual Revenue Budget. Equipment and articles of a capital nature, should be separately provided and processed under the capital expenditure policies and schemes of the company.

2.9 TRAINING FOR EXPANSION

2.91 A case for immediate action

The supply of trained manpower, irrespective of where a new 2 million tons steelworks is located , is perhaps the most formidable problem in the entire proposal for expansion of steel production in Peru. It requires planning in depth, and early and vigorous action, backed by substantial resourses. About 80% of the people selected for training will have to be the fresh output of academic, technical and professional institutions in the country. This means that about 4500 young men have to be selected and trained over a period of 5 to 6 years. The period of training will vary from 2 to 3 years for the fresh output of academic institutions, depending upon their basic qualifications, and the levels for which they are being trained. A cursory investigation reveals that at the professional level there are at present very few in the disciplines required, presently

enrolled in professional institutions.

2.92 Location of human resources and training facilities

While some good work is being done by EXPA in this area, the emphasis is naturally on the approved projects for the Balancing Scheme, and tentatively for the first phase of expansion of Chimbote. There is a need to make a systematic survey of qualified manpower for recruitment and training, and secondly, the location of training facilities in Industry in Peru. Nearly 4000 out of the 4500 estimated requirements must be trained in the country, and hence the urgent need of immediately locating suitable training seats.

SECTION III

THE IDEAL PATTERN FOR MANPOWER PLANNING EDUCATION, TRAINING AND DEVELOPMENT OF STEEL PLANT PERSONNEL

3.1 HUMAN RESOURCES IN INDUSTRY

Advances in engineering and technology have opened the way to large-scale industrial production. This in turn has led to a large-scale demand for skilled labour and professional technicians and management personnel. Moreover, the infrastructure required to service and co-ordinate manufacturing industry creates a need for many other skills. It is increasingly recognised today, that human resources, rendered more efficient through education and training, have at least as great an impact on industrialisation in developing countries, as has the accumulation of capital. Many developing countries, however, are still short of the skilled and qualified manpower needed for economic and industrial development. They continue to emphasise the factors of capital and natural resources over that of manpower, although lack of adequately trained personnel is sometimes the most serious handicap in carrying out industrial development programmes.

3.2 THE BASIC OBJECTIVES

The basic objectives should therefore be;

a) to generate new and specialised skills quickly and
b) to make efficient use of those that exist.

To achieve these objectives, we will have to subject the manpower problem to rigorous analysis, giving it the same priority as to a major economic sector such as agriculture or communications.

3.3 MAN, THE CORE OF ANY ACTIVITY

A chain of relationships connects the ultimate production and distribution of a service, with the human resources employed to achieve the targets set. In the formulation of a nation's political, economic, cultural and social goals, it is being realised all over world, that "man" is no longer "a means to an end". He is the beneficiary of the services he has helped in producing. The development of human resources must therefore concentrate on the overall and alround development of the individual, not only to assist in the development of the sector in which he works, but also to enable him to participate fruitfully in the society of which he is a member.

3.4 THE THREE MAIN STAGES INVOLVED

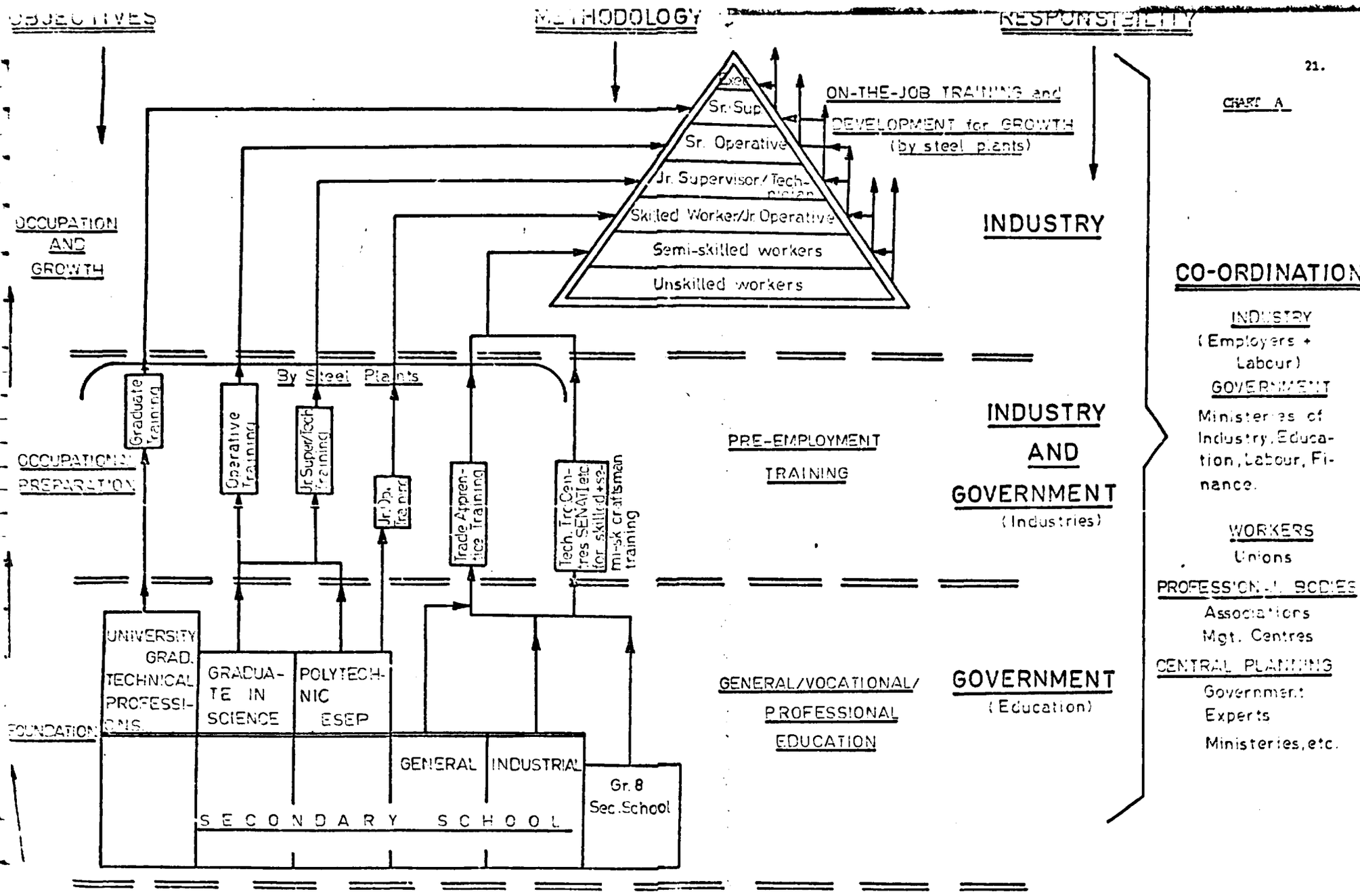
In the overall development of the individual, the following 3 stages may be recognised.

1. Education — to give him the foundation for any developmental activity-social, cultural, economic, or political.
2. Training — to prepare him for an occupation of his choice, within the limits imposed by conditions in the country.
3. Development — to provide for his growth in his occupation, and for his contribution to the society in which he lives.

3.5 A GRAPHICAL REPRESENTATION OF THE PROCESS

The following chart illustrates the process of Manpower Planning, education, training and development for the Steel Sector. An attempt has been made to indicate briefly the objectives of each stage in the development of the individual, the methodology to be followed, on whom the responsibility lies for each stage, and a system of co-ordination so essential for planned development.

CHART A



MANPOWER PLANNING EDUCATION, TRAINING AND DEVELOPMENT FOR THE STEEL SECTOR

SECTION IV

SUMMARY OF RECOMMENDATIONS

4.1 INTRODUCTION

4.11 A comprehensive training and development activity at Chimbote

This summary describes in brief, the principal recommendations of the consultant. It indicates the changes to be introduced in respect of activities, programmes, systems, facilities and organisation to form a comprehensive training and development activity at Siderperu's Works in Chimbote. In doing so, care has been taken to cater to every level in the organisation, right from unskilled workers to management personnel.

4.12 Current activities and present needs

In making these recommendations, the present training and development programmes of Siderperu (see SECTION 1) have been considered in detail, and the current and future needs of the Company for the preparation of personnel for non-management and management jobs, and their development and advancement to levels of higher performance and responsibility. The objective has been to strengthen and consolidate existing programmes and facilities where needed, and introduce new ones to fill the gaps as has been indicated in SECTION 2.

4.13 The concept utilised

The overall concept combining the complementary functions of manpower planning, education, training and development of steel plant personnel, explained in the previous section (SECTION 3) has been followed as closely as

practically possible, considering the existing constraints. This will ensure a sustained supply, maintenance and growth of a steel cadre, so vital for the growth of the steel industry in Peru.

4.2 MANPOWER FOR EXPANSION

The country is definitely committed to a phased programme of expansion of steel-making capacity in the country. While the existing steel plant at Chimbote, cannot by itself, train and supply about 5000 skilled and supervisoy personnel that will be required for such expansion , it will have to bear a major role in this activity. Manpower planning on a systematic basis, recruitment of personnel, arrangements for their training in the steel works, in industry in the country, and abroad, etc. are all major tasks, which SIDERPERU will have to undertake. In the recommendations that follow, all these factors have been kept in mind, and necessary provisions made.

4.3 RECOMMENDATIONS

4.31 Formal pre-employment apprenticeship

There is a need to introduce formal pre-employment training or apprenticeship courses for fresh recruits from academic / vocational / professional institutions in the country, who, on successful completion of training, will be injected at pre-selected levels in the Plant organisation. A judicious combination of freshly trained young men injected at various levels, and experienced employees developed and promoted from down-the-line, gives strength, vitality and dynamism to the organisation.

The following four programmes are proposed to be introduced.

a) Trade Apprenticeship Course

This is a course for Maintenance craftsman training, having a duration of 2, 3 or 4 years depending on the trade. Students who have passed out from Secondary or Industrial School, or Vocational Training centres will be selected for this apprenticeship.

b) Technician / Line-supervisor Training Course

This is a combined theoretical and practical training course of 2 years duration for students of Polytechnics, ESEPS and equivalent professional institutions, who will be trained to occupy positions of technicians and first-line supervisors.

c) Operative Training Courses

These are special pre-employment training courses to produce Junior and Senior operatives or operation personnel such as steel makers, rollers, etc, as distinct from maintenance, for work in the operation and producing units of the steel plant. A duration of 1 1/2 year is envisaged for Junior Operative trainees, and 3 years for Senior Operatives. The training will be job-oriented and will consist of maximum on the job practice, with related theoretical instruction.

Admission qualifications will be a Diploma in Metallurgy (from Polytechnic, ESEP) or Graduate in Science for the Senior Operative Course, and a correspondingly lower level for Junior Operative Course.

d) Graduate Training Course

This course will consist of 2 years intensive theoretical and practical training. Admission will be restricted to University Graduates in various disciplines, who will be trained and prepared to occupy positions in senior supervision in operation, maintenance, administration, sales and other specialised functional areas.

4.32 Training and development of workers and supervisors

Simultaneously with the injection of properly trained personnel at various levels, there is a need to develop existing employees - both workers and supervisors - for improved performance on the job, for up-dating knowledge and skills, and for up-grading for promotion and growth in the organisation. Besides giving strength to the organisation at various levels, it is an important source of motivation and boosts the morale of the total work-force.

Courses and programmes are suggested under the following three categories.

a) Worker development

i) Worker development in maintenance skills and knowledge

ii) Refresher courses for operation workers.

iii) Knowledge-based part-time courses for workers to move into supervision

b) Development of supervisors and senior operatives

i) Supervisory development programmes

ii) Training of training personnel

iii) Knowledge-based part-time courses to move into higher supervision

c) Management training

i) Management development courses at the plant level.

ii) Need-based seminars, forums, technical discussions at plant level.

iii) Deputation to need-based external courses.

4.33 Establishment of a Training Centre (Workshop and Institute)

a) The needs in terms of knowledge, skill and attitude are special to a steel plant. If we desire a higher efficiency and output from the work force, training and development should as far as possible, be conducted by the Steel plant itself according to its special needs. With the proposals for introducing several new courses, the necessity for the Chimbote plant to have its own Training Centre, with training workshops, laboratories and classrooms, becomes more evident. The facilities to be provided should be sufficient to impart practical and theoretical training to the fresh recruits under the pre-employment training schemes, and to conduct courses meant for the development of practical proficiency of existing maintenance workers.

b) Specifically the Centre's facilities will be needed for the following:

i) Basic Education Courses

ii) Practical Shop-training for various categories of apprentices and trainees in the Training Work-shop.

iii) Part-time practical training to unskilled and semi-skilled workers for up-grading, and up-dating practical proficiency.

iv) Related Technical theory and allied courses.

v) Refresher courses (technical) for operation and maintenance personnel.

vi) Part-time professional (technical)courses for qualifying personnel.

vii) Trade testing of workers for certification and/or promotion.

c) Such a Centre, adequately provided with buildings, machinery, equipment etc. will require large financial resources. The costs can be reduced to a minimum, if we plan a training capacity that will cater to the normal needs of the plant after balancing or expansion. If we wish to look ahead and plan for the future, there is a dire need for such a facility.

4.34 In-plant Training Service

In-plant training is an important activity presently being carried out in Chimbote. The modifications suggested are to increase the scope of this service and make it more effective. This is necessary, particularly in view of the new programmes proposed to be introduced, and the large scale inplant training that will be called for to cater to the steel industry's expansion needs. It is proposed to make this service more plant-oriented, with the departmental superintendents and supervisors recognising and accepting their responsibility for the development of their own, and the company's staff.

a) Major activities in this area

The following major tasks are envisaged.

i) Conducting and supervising all in-plant training of Graduate, Operative, Line-Supervisor/Technician and Trade Apprentices.

ii) Assessment of departmental training needs, and development of courses for departmental employees.

iii) Imparting on-the-job instruction, and conducting on-the-job training for departmental employees.

iv) Evaluation of programmes, and personnel being trained on-the-job and in-plant.

v) Assisting in the appraisal of departmental workers and supervisors, and co-ordinating with line-staff, their developmental and training needs.

b) Organisational set-up for this service

The works department Superintendents or Chiefs, must be recognised as the key persons in training within their departments, just as they are in all other activities of their departments. There is a need, however, to assist them in this, because they personally do not have the time, nor have they experience with training methods and techniques to be able to meet all the departmental training needs that will arise. They have need for someone to whom they can delegate this responsibility to help carry out the training activities which they approve. They require expert advice in this field of training which is becoming a specialised profession.

In the organisational set-up for this section, it is recommended that a Training Engineer be established in each major works department, on the following basis:

i) The Training-Engineer will assist the Superintendent of the department in all training activities conducted in that department, or

for that department's personnel.

ii) The person assigned this position should be selected from the senior supervisory staff, who has knowledge and experience in depth of the department's operations, adequately backed up by professional knowledge.

iii) The Training Engineer will be <u>administratively</u> (directly) responsible to the department's Superintendent and <u>functionally</u> (indirectly) responsible to the Plant's Training Department.

iv) The Training Engineer selected, should be thoroughly instructed in training techniques and practices to enable him to perform his functions.

v) The Training Engineer should retain his status, rights, benefits and seniority of his substantive position in the department, but work as a Training Engineer on a full-time basis. He will, of course, continue to be available for departmental emergencies at the discretion of the superintendent.

vi) <u>Reporting functionally</u> to the Training Superintendent, he will advise on all departmental training problems, seek and obtain staff assistance of the Training and Development Division.

vii) He will perform, alone, or with assistance of departmental supervisors, all the duties shown under (a) of this recommendation, viz 4.34 (a)

4.35 <u>Planning for Manpower and its development</u>

The author has had the opportunity of developing a

scientific approach to Manpower Planning at the level of the enterprise, and operating such a programme for the last 9 years in a major steel Company in India. It's success lies in studying and reviewing on a continuing basis, the whole range of occupations in the firm, determining short-term and long-term targets, and making concrete proposals for obtaining the company's manpower requirements, both in terms of quality and quantity, at the time when they are required.

In making its recommendations on a plant-wise basis, individual departmental heads are required to participate actively. An inventory is also made of the existing human resources of the organisation, and the possibility of their development.

It is proposed to create a new department to undertake this important function for the company. Its major activities will be

i) Manpower planning at all levels.
ii) Manpower inventory for all departments.
iii) Development of appraisal systems for supervisors and executives, and follow-up on their use.
iv) Co-ordination, and nomination to external courses, both within and outside the country.
v) Expansion manpower planning.
vi) All foreign training, including formalities for clearance, deputation, costs, etc.

4.36 Introduction of Scientific Appraisal Systems

It is recommended that appraisal or personnel evaluation systems be introduced at three levels:

i) At the worker level, by an objective TRADE TESTing procedure, laying down minimum standards.

ii) At the supervisory level, using properly designed forms to be completed and submitted annually by departmental heads.

iii) At the executive level, covering assistant departmental heads and equivalent, and above.
A separately designed "Executive Appraisal Form" will be used for this category of staff, to be completed and submitted annually, by the divisional heads concerned.

In the interests of attaining production and maintenance targets, and in the interests of the workers themselves, a realistic and objective method of assessing worker's skills and knowledge in relation to a particular post, is most essential. Not only are we assured that men having the ability and knowledge are placed in or promoted to skilled posts, but it also ensures the safety of the workers themselves. Furthermore, it provides a worker with the incentives and motivation to improve himself, if this assessment is used for certification, and as a minimum requirement for promotion to particular positions along well established promotional channels, within the department, or in the whole organisation. In operating this trade-testing scheme, the close collaboration of the line-staff will obviously be necessary.

In regard to "supervisory" and "executive" appraisals, however, the objectives will be not so much centred on performance ratings for the purpose of punishment or

reward, but more for discovering the strengths and weaknesses of the individual, and assisting him in making up his short-comings, and building on his strengths for his overall development and growth. The system should be so designed, that the appraisal is an "objective" one, and not likely to be "subjective". The advantages of "appraisal" systems are obvious. The success of the scheme however depends on the design of the process, the participation and interest of line-executives, and the proper utilisation and follow-up of the findings of the appraisals.

4.37 Budget and Cost Control

The consultant's observations on this subject have been given in 2.8 of SECTION 2 of this report. The following specific recommendations are being made.

a) Annual Revenue Budget

At the policy making level, the Company must first indicate and approve the programmes and courses to be conducted and the activities and functions of the Training and Development Division and its constituent departments. Based on this policy, and specific approval, the Division of Training and Development will frame and submit to management , a REVENUE BUDGET based on the company's training needs, at least 3 months before the commencement of the ensuing financial year. After scrutiny by the Training and Development Advisory Committee, the Plant Finance Manager, and the General Manager, sanction should be

accorded, taking also into consideration the finances available. This sanction should be given at the beginning of the financial year in question, and the Division should then be free to implement the various programmes within the sanctioned budget.

b) Capital Budget

Items of a capital nature, such as buildings, machinery, equipment etc. should be separately included in a separate CAPITAL BUDGET for the division, and submitted and processed according to the normal procedures of the Company. Sufficient justification will have to be given for the purchase of goods of a capital nature. The management's sanction will depend on its total capital budget allocation, and of course urgency of requirements. After approval of the capital budget, the Training and Development Division, will follow up the approved proposals through the normal channels, which are usually - finance , purchasing and engineering.

c) Budgetary Control

Each department of the division will exercise control on the expenditure/receipts sanctioned for it. An overall control on expenditure, with special reference to budget sanctions, will be exercised by the Director, through his secretariat, where there should be a Budget or Accounts officer. A properly framed and correctly estimated Revenue

Budget, showing separate main and sub-heads of expenditure and receipts, is essential for exercising this control. A monthly or quarterly cost statement from the Accounts Division, will indicate expenditure trends well in time to exercise control. Normally, a deviation of not more than ± 5% should be allowed under major heads, and the total budget sanctioned.

d) Size of the Revenue Budget

The expenditure sanctioned for Training and Development activities, will necessarily depend on training needs and activities and availability of finance. At times, the amount will be rather high, particularly at a time of expansion. when manpower requirements are abnormally high. At normal times, however, a reasonable expenditure on training and development activities should be of the order of 1% of the annual wage bill of the Company, upto a maximum of 1 1/2%.

4.38 Organisation for training and Development of Personnel

A separate section, SECTION 5, in this report has been devoted to this recommendation, as it involves the merging of some of the existing activities, the redistribution of some, the amplification of others, and the introduction of new functions.

4.4. FINANCIAL IMPLICATIONS OF THE PLAN

The financial implications will have to be worked out under three separate heads:

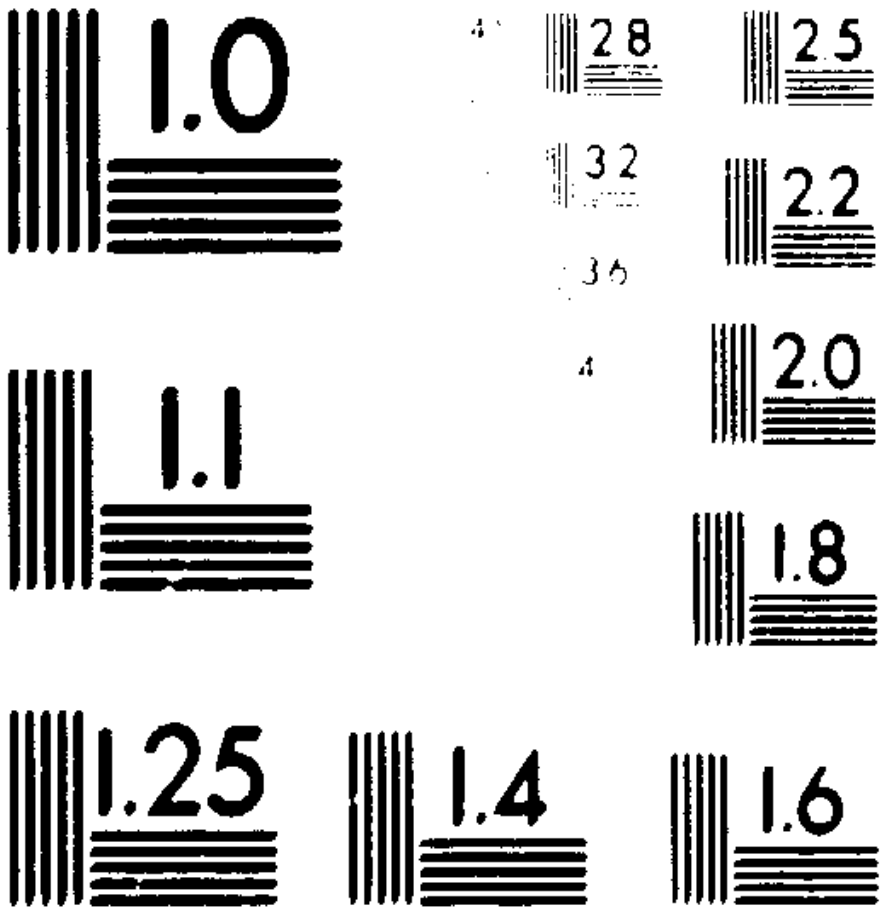
i) Annual revenue expenditure under normal times - ie. present conditions.

ii) Capital expenditure for introduction of new activities and facilities

iii) Expenditure on manpower requirements for expansion.

It is necessary to keep these 3 areas separate in order to make a realistic appraisal of the financial implications, and charge them to appropriate company budget heads.

Because of the various factors involved, and further studies necessary, it is not possible to indicate here the costs for these 3 items. It may be mentioned however, in regard to (i) above, that the expenditure will be in the neighbourhood of 1% to 1 1/2% of the annual wage bill of the Company.



SECTION V

ORGANISATION FOR

TRAINING AND DEVELOPMENT OF PERSONNEL

5.1 INTRODUCTION

In order to provide fully effective training in Siderperu, it is essential that the structure of the training organisation and the functions allocated to various sections and depart - ments be clearly defined. This section sets forth the views of the Consultant on these considerations. It is believed important that the training and development division at Chimbote be expanded and strengthened, not only to take care of Siderperu's current needs, but also future needs that will arise due to the expansion of steel making capacity in Peru. With a clear cut delineation of responsibility, capable indi - viduals can be designated to plan and implement the necessary training and development activities at all levels of the company.

5.2 FACTORS CONSIDERED IN RECOMMENDING ORGANISATION STRUCTURE

5.21 Existing activities of the Division

There is a need for continuing the existing activities, in modified form, being undertaken by the various sections and departments at present viz. EBLA, CADE, EXPA, CAEX and SEDU. In the recommended organisation structure, the attempt has been at rationalisation. To avoid duplica - tion of efforts, and provide a more co-ordinated control, the present activities, have been suitably allocated to the new sections and departments. Where necessary, modi- fications have been suggested.

5.22 Expanding specific areas

In view of the importance of certain activities, mentioned in SECTION 4, specific suggestions have been included for expanding certain areas. In the proposed re-organisation therefore new and separate departments have been proposed or redesignated, in view of the importance and full-time nature of these areas.

5.23 Introduction of new programmes

Several new and specialised activities have been proposed, falling within this whole area of Training and Development of Personnel. Some of them have been grouped in the appropriate section or department, and for others, new sections or departments have been proposed.

5.24 An Action-oriented organisation

From the far-reaching recommendations proposed in this TRAINING PLAN for SIDERPERU it will be obvious that some will take time to develop and implement. This should not hold back implementation of other schemes, which do not involve much time and expense, and which can be introduced, more or less immediately. The recommended structure has kept this in mind so that the proposed organisation can be properly manned at the appropriate time to work on the new schemes.

5.3 RECOMMENDED ORGANISATION STRUCTURE

5.31 Proposed organisation chart

The following CHART B , gives the recommended organisation structure for the Training and Development Division.

5.32 Nomenclature used

The nomenclature given to the various departments and sections, has been so chosen as to indicate , more specifically, the functions alloted to them. Suitable abbreviations, if required, can be worked out.

5.33 Description of functions and activities

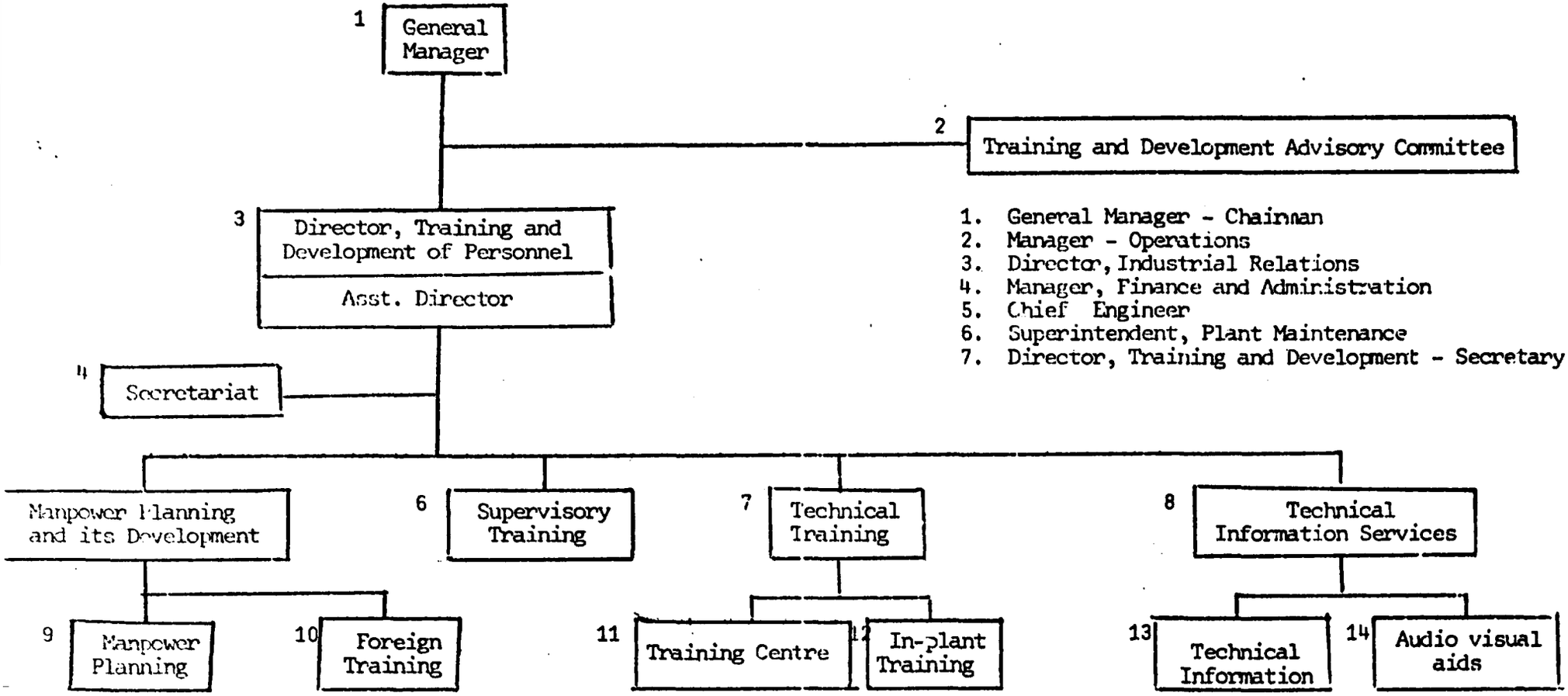
Immediately following the organisation chart are statements 5.3 (a) to 5.3 (d), which give a brief description of the functions and activities proposed to be carried out by the major sections and departments shown in the proposed organisation chart.

NOTE: Those activities marked with an asterisk* are proposed new activities or programmes.

PROPOSED ORGANISATION CHART FOR THE

DIVISION OF TRAINING AND DEVELOPMENT OF PERSONNEL

SECTION 5.3
CHART - B
(In English)

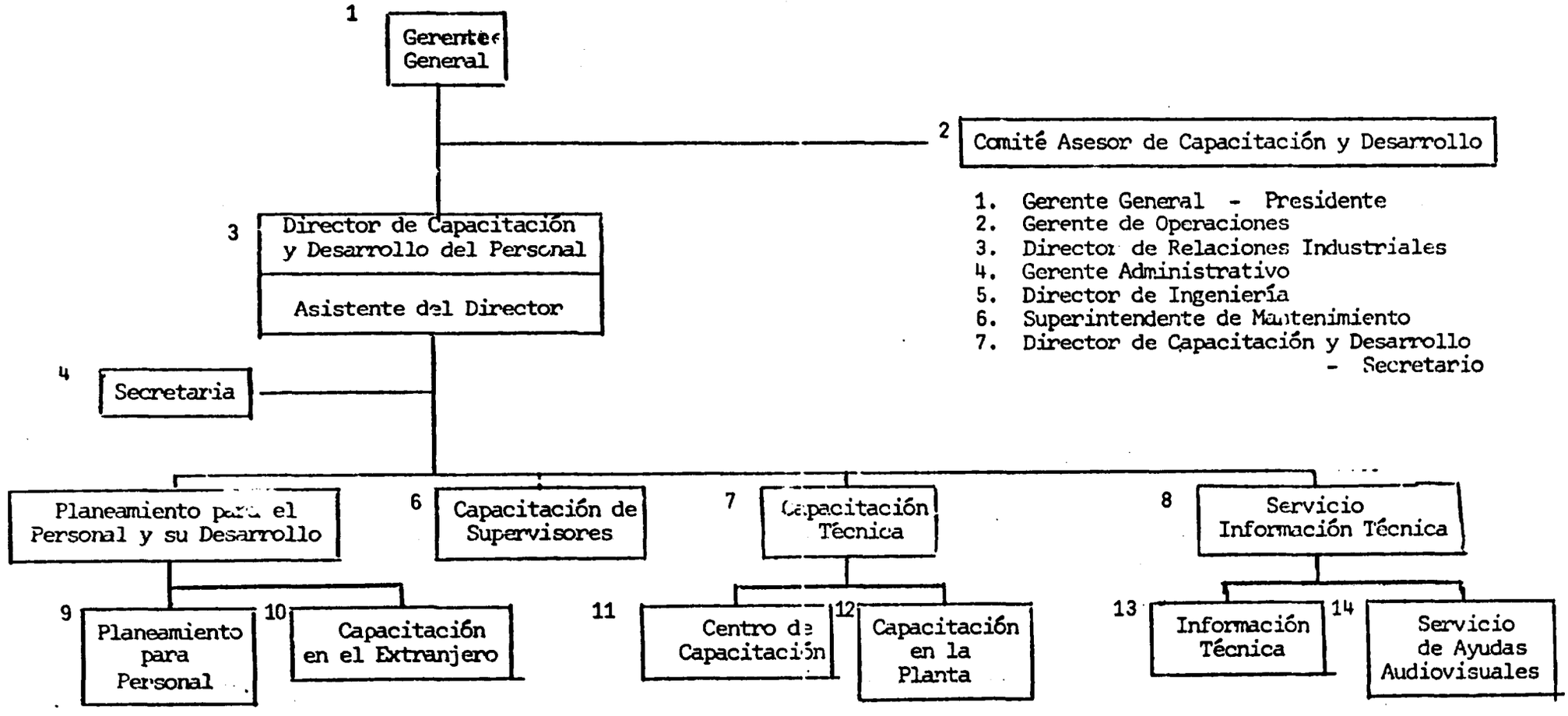


1. General Manager - Chairman
2. Manager - Operations
3. Director, Industrial Relations
4. Manager, Finance and Administration
5. Chief Engineer
6. Superintendent, Plant Maintenance
7. Director, Training and Development - Secretary

GRAFICO PROPUESTO PARA LA ORGANIZACION DE LA

DIRECCION DE CAPACITACION Y DESARROLLO DEL PERSONAL

SECTION 5.3
CHART - B
(en castellano)



5.3 (a)

3. DIRECCION DE CAPACITACION Y DESARROLLO DEL PERSONAL

i) Reports directly to the General Manager, and advises management on training and developmental needs of the Steel Plant.

ii) Within the Company's approved training policy, plans the various training and development activities, including physical facilities.

iii) Implements, directs and controls the various activities through the departmental heads under him.

iv) Is responsible for the selection of personnel recruited from outside for being trained for specific steel plant jobs.

v) Co-ordinates the activities of the various departments in his Division, for the smooth, efficient, effective and economic implementation of training policies.

vi) Evaluates the progress and effectiveness of the various training activities, and after review, recommends addition or changes to the Company Training Plan in consultation with the Training and Development Advisory Committee.

vii) Prepares and submits Annual Revenue and Capital Budgets and after approval, operates the same, and exercises control on expenditure.

viii) Maintains the necessary statistics and records of the division and departments' activities, and submits annual and other reports to the management.

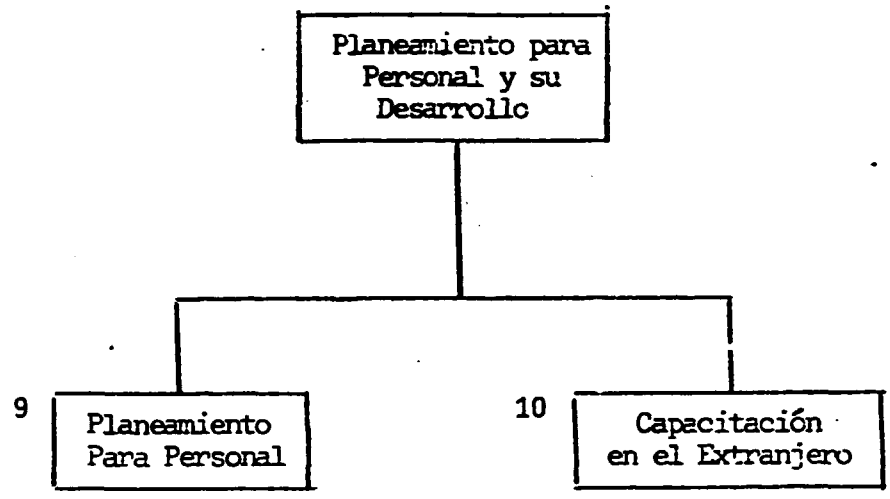
4. SECRETARIA

i) Secretarial assistance to the Director and Division, and processing of all papers.

ii) Maintenance of departments' and divisions statistics and records, preparation of Annual Report and other reports, maintenance of minutes of meetings, and of the Training and Development Advisory Committee.

*iii) Preparation of Annual Revenue and Capital Budget for the Division, and control of financial and budget operations of the various departments.

5. PLANEAMIENTO PARA PERSONAL Y SU DESARROLLO



9. Planeamiento para personal

* i) Manpower planning at all levels

* ii) Manpower inventory for all departments

* iii) Follow-up of appraisals of supervisors and executives

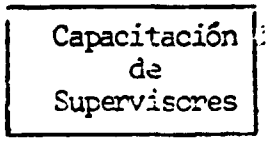
iv) Co-ordination and nomination to external courses, both within and outside the country.

10. Capacitación en el extranjero

i) All foreign training , including all formalities for clearance, deputation, costs, budget, etc.

ii) Expansion planning with special reference to foreign training.

6. CAPACITATION DE SUPERVISORES



i) Based on analysis of requirements and training needs, plan types of courses needed for supervisors, and management personnel.

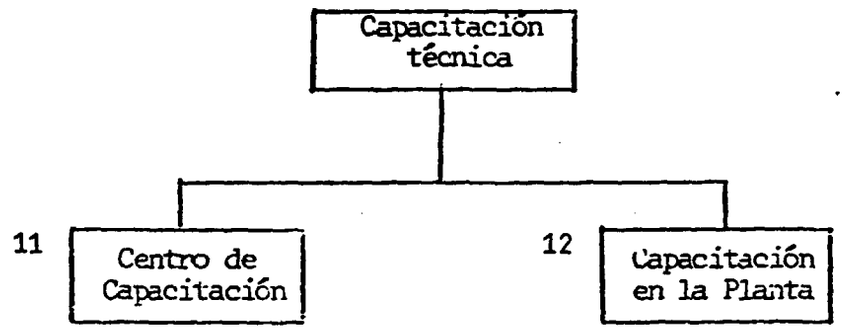
ii) Develop and conduct courses planned.

* iii) Conduct "Basic Management Seminar" for Heads of all departments.

iv) Develop and conduct courses on "Training of Training Personnel"

* v) Arrange technical lectures, need-based seminars, forums, etc.

7. CAPACITACION TECNICA



11. Centro de capacitación

i) Basic Education Courses

* ii) Refresher courses (technical) for operation and maintenance personnel

* iii) Part-time professional (technical) courses for qualifying personnel for promotion

* iv) Practical Shop-training for various categories of apprentices in the training shop.

* v) Part-time practical training in the training shop for unskilled and semi-skilled workers to upgrade their practical proficiency.

* vi) Trade Testing of workers.

12. Capacitación en la planta

* i) Plan, conduct and supervise all in-plant training of Graduate, Operative, Line supervisor and Artisan ap -

prentices.

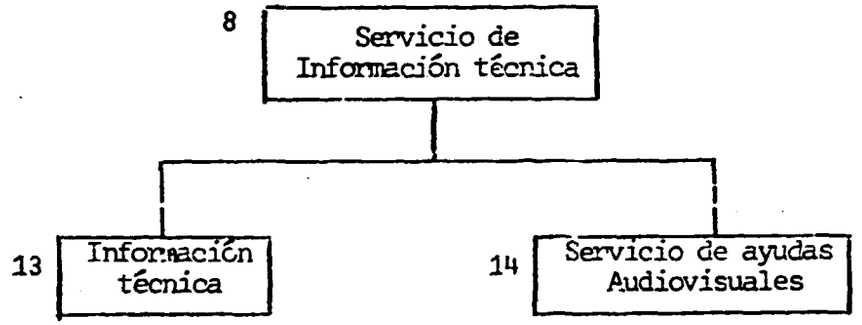
ii) Assess departmental training needs and develop training courses for departmental employees.

iii) Impart on-the-job instruction, and conduct on-the-job training for departmental employees.

iv) Evaluation of personnel being trained on-the-job and in-plant.

* v) Assist in the appraisal of supervisors etc, and co-ordinate with line staff their developmental and training needs.

8 SERVICIO DE INFORMACION TECNICA



13. Información Técnica

i) Technical and professional Library Service for Company staff, participants of various courses etc.

ii) Translation and printing of technical literature as required

* iii) Dissemination of technical information through Bulletins classified information to officers and departments, extracts of latest steel technology etc.

14. Servicio de Ayudas audiovisuales

i) Audio-visual services for the division, and company's conferences, seminars, etc.

* ii) Development of audio-visual aids for training and development courses, seminars, etc.

5.4 PERSONNEL FOR MANNING THE DIVISION

5.41 Infrastructure

The Consultant is pleased to observe, that the existing Division for the Development of Personnel, has the necessary infra-structure, for introducing and implementing many of the activities proposed. With a certain amount of re-deployment of existing personnel, recruitment of others, as and when facilities are ready for introduction of new activities, and the "training", of training personnel, it is expected that this Division will have properly trained personnel to conduct its numerous activities.

5.42 Training of Training Personnel

Training of personnel, like any other occupation, requires certain specific skills, professional knowledge and attitude. The nature of these requirements will vary with the level of occupation, and the specific nature of the tasks entrusted to the various training staff. For performing their tasks most efficiently and effectively, it is necessary that training personnel should themselves be "trained". One of the new tasks of this division will therefore be the training and development of its own personnel.

5.43 A built-in development structure

Keeping this in mind, the organisational structure has been so designed, that it has a built-in system for the training and development of training personnel that it employs. Suitable avenues for growth and promotion have

been provided, and among the various training and development methods now being adopted, there is ample scope for using the"JOB ROTATION" method at different levels.

5.44 Senior staff requirements

The following statements 5.44-a, and 5.44-b, indicate very broadly, the senior staff requirements for the various sections and departments. It may be mentioned here, that requisite staff are to be selected and appointed, only when the facility has been approved, and the course or activity is ready for implementation. This also applies to other staff that will be required at other levels.

SENIOR STAFF REQUIREMENTS

FOR THE DIVISION

Nº	SECTION/DEPARTMENT	POST	NUMBER	LEVEL
3.	Dirección	Director	1	
		Assistant Director	1	
		Secretary	1	
4	Secretaría	Administrative Officer	1	4
		Budget Officer	1	4
5.	Planeamiento para Personal y su desarrollo	Chief	1	1
		Manpower Planning Officer	2	3
6	Capacitación de Supervisores	Chief	1	1
		Asst Chief	1	2
		Training Officer	1	3
7.	Capacitación Técnica	Chief	1	1
	11. Centro de Capacitación	Asst Chief	1	2
		Training Officer (shops)	1	3
		Training Officer (Institute)	1	3
		Education Officer	1	3
		Trade testing Officer	1	3
	12. Capacitación en la planta	Asst chief	1	2
		Training engineer	1	3
		Training co-ordination Officer	1	3
		Asst Trg. co-ordinator	1	4
		(Training Engineer-plant-)	5	3

5.44 (b)

Nº	SECTION/DEPARTMENT	POST	NUMBER	LEVEL
8.	Servicio de Información Técnica	Chief	1	1
		Librarian	1	4
		Audio-visual Aids officer	1	4
		Total en Dirección	24	
		en la Planta	5	
		GRAND TOTAL	29	

SUMMARY

Director	1		
Asst. Director	1		
Secretary	1		
Level 1	4		
Level 2	3		
Level 3	9	En la planta	5
Level 4	5		
	24	+ 5 =	29

ENCLOSURE V

INDUPERU

TRAINING ABROAD OF KEY PERSONNEL FOR THE CHIMBOTE EXPANSION

-- Ingº BENEDICT FERNANDEZ
Asesor de ONUDI

OBSERVATIONS

1. Balancing and Expansion

Siderperu's master plans include:

a) Balancing Scheme to raise production from the present 450,000 T/year to 700,000 T/year by 1976/77.

b) Phase A. of expansion to reach a capacity of 1,550,000 T/year by 1979; and

c) Phase B. of expansion to go upto a capacity of 2,350,000 T/year by 1984.

So far, only the "Balancing Scheme" has been approved by the Government, and steps are being taken for implementation.

2. Personnel requirements

Engineering studies by SOFRESID, the French consultants have been submitted, giving details of units to be installed, the proposed construction and erection schedules, equipment manning, and man - power requirements. According to the estimates, a total of 5549 persons will have to be trained to man facilities proposed to be installed under the expansion programme.

3. Arrangements for Training

Presently, Siderperu is working on the schedule of requirements based on proposed start-up dates for different facilities. Training will have to be imparted in the country and abroad. The number of persons to be trained abroad has to be carefully determined, in view of the high costs involved, and that too, in foreign exchange. Under similar situationsand conditions prevailing in Peru, normally about 7 to 10% of the total force, would require training abroad in similar plants, equipment suppliers etc.The rest of the persons required has to be from the open market in the country, or fresh people from academic institutions specially selected and trained in the country. Not much has been done in this direction..

4. Identification of Key positions

The following procedure was adopted by Siderperu. A high-powered Committee was appointed consisting of the following officers:

1. Manager, operations
2. Jefe of the department
3. Jefe of Plant Maintenance
4. Director, Industrial Relations
5. Representative of Chief Engineer
6. Representative of SOFRESID, Consultants
7. Representative of Equipment Suppliers concerned
8. Independant expert from related company
9. Director of Training and Decelopment

This Committee made a study of all the processes involved, the equipment to be utilised, the technology to be adopted, facilities available in Peru, etc. and carefully compiled a list of KEY POSTS for all sections and departments.

The enclosed report gives summary and plant-wise requirements. From a scrutiny of nature of positions and numbers, qualification necessary etc., I am of the opinion that this list has been well drawn up.

5. Responsibilities attached to key positions

Key positions are those that are responsible for giving operating results, and are mainly in the production field directly connected with production. There are also key positions in the other functional areas of maintenance, finance, industrial relations, marketing, sales, etc. Persons manning key positions, will have to be carefully chosen and trained, so that they are equipped with all the "know-how" required of the position in terms of professional knowledge, skills, abilities and attitude.

6. Selection of Key Personnel

Key personnel, that is those who are to hold key positions in the industry, have another important responsibility, and that is to train the persons working with them, and under them. It is necessary therefore that selection is made very-carefully, to ensure that he has the professional knowledge and background, a minimum of experience in a related area, the ability to absorb training, and the ability and willingness to impart and share his know-how with colleagues, on his return.

7. Analysis of Category of positions

For reasons stated earlier, one of the requirements would be that key personnel should mainly belong to first-line and senior supervisory positions. A certain number would have to be from the senior operative and highly skilled maintenance worker categories, but this proportion is normally about 20 to 25% of the total. An analysis of Siderperu's figures shows that the proportions are within normal standards.

Level	Category	Qualification	Open		Maint.		TOTAL	
			Nº	%	Nº	%	Nº	%
1	Senior Supervisors	University Graduates	124	80%	31	20%	155	36%
2	Line Supervisors/Technicians	Polytechnic Level	109	59%	76	41%	185	43%
3	Senior Operatives	Politechnic, Science Graduate or Equivalent	44	-	-	-	44	21%
5	Skilled workers (maintenance)	High School plus apprenticeship, or equivalent	-	-	50	-	50	
			277		157		434	100%

8. Selection Procedure

In the absence of readily available appraisals of possible personnel in Siderperu for being selected for training as key personnel, the procedure being adopted is cumbersome and time-consuming. However, Siderperu is taking necessary precautions and making all efforts to try and select the right persons for key positions to be trained abroad. The departmental head submits a panel of 3 names, for a specific position, and a special committee makes the final selection of the best candidate, based on considerations mentioned earlier.

9. Preparation before going abroad

One of the conditions is proficiency in the language of the country where a person will be sent. Siderperu is presently conducting language courses for those of its staff interested, or likely to go abroad. The languages being taught are English and Italian. They may introduce German and French later. Those selected will also be put through a course on "How to Instruct", and key personnel are required to remember the key points during training abroad, to help them on their return, to train others.

10. Training Abroad and follow-up on their return

Individual and specific training programmes are necessary for training abroad. Periodical progress reports will be received. On their return, the key personnel, will have to prepare training manuals etc. to assist them in the training of personnel manning their specific units.

SIDERPERU, CHIMBOTE WORKS

DIRECCION DE
DESARROLLO DEL PERSONAL

DEPARTAMENTO DE EXPANSION

TRAINING PROGRAMME

SUMMARY CHART

PROJECTS		TRAINING ABROAD	TRAINING IN PERU	SUB TOTAL	TOTAL NUMBER
		KEY PERSONNEL	SKILLED PERSONNEL (Workers & Supervisors)		
TINPLATE PLANT	MANT OPER	10 18	34 102	44 20	164
MERCHANT MILL	MANT OPER	4 15	35 118	39 133	172
OXYGEN PLANT	MANT OPER	5 4	11 22	16 26	42
CONTINUOUS CASTING PLANT	MANT OPER	4 7	20 34	24 41	65
SLAG PROCESSING FACILITY	OPER	2	23	25	25
NEW ELECTRIC STEEL FURNACE	MANT OPER	4 7	23 58	27 65	92
DIRECT REDUCTION PLANT	OPER	2	25	27	27
COKE OVENS (Battery N°1)	MANT OPER	9 22	89 365	98 387	485
BLAST FURNACE N°2	MANT OPER	13 16	160 107	173 123	296
NEW STEEL PLANT (LD + CONT. CAST)	MANT OPER	25 30	246 697	271 727	998
NEW OXYGEN PLANT	MANT OPER	5 4	11 22	16 26	42
GALVANISING UNIT	MANT OPER	4 6	10 72	14 78	92
SEMI-CONTINUOUS STRIP MILL	MANT OPER	25 32	206 524	231 556	787
CONTINUOUS STRIP MILL	MANT OPER	14 7	178 287	192 294	486
AUXILIARY SERVICES	MANT OPER	20 15	346 710	366 725	1,091
STAFF SERVICES		105	580	685	685
TOTAL		434	5,115		5,549