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IN-PLANT GROUP TRAINING FOR ENGINEERS
IN THE FIELD OF ELECTRICAL INDUSTRIES
IN SWEDEN

by

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The views and opinions expressed in this paper are those of the consultants and do not necessarily reflect the views of the Secretariat of UNIDO.

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We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.

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1. Introduction

The project "In-Plant Group Training in industrialized countries for experienced engineers from developing countries" which was started by the United Nations in 1964 demands good co-operation between the United Nations and the authorities responsible for the training in the different countries.

It was an honour to Sweden when UN in 1964 put an inquiry if Sweden was willing to carry through a training course of this kind. ASEA is the biggest company within the electrical field in Sweden, but its production is not limited to the electrical field. In the matter of design, manufacturing and sales within the heavy-electrical field, nuclear power, electrical equipments for light to heavy industries and a number of other adjacent fields ASEA have long experience. Furthermore ASEA have many years of experience of post-graduate training courses for engineers from Scandinavia and from abroad.

In the aide-memorie from UNIDO it is stated that "the intention of the training programme was to provide the participants, over a short period, with technical skills and practical experience which would have taken considerably longer time to accumulate during their customary work in their home countries". In the information from UNIDO it is furthermore stated that "a primary objective of the training programme is to give the engineers who are already working in the industrial establishments of the developing countries the benefits of in-plant training" and "the training may be conducted through lectures, discussions, demonstrations and visits to exhibitions and industrial centres but in-plant training and familiarization with actual problems and practices should be the predominant feature of the course".

With this in view the most suitable is to carry through a training like this in an industry. Therefore it was natural that the Swedish Government asked ASEA in this matter.

2. Administration of the training

As mentioned above ASEA have many years of experience in post-graduate training of engineers. All this training is administered by the Education and Training Department. Therefore this UN-In-Plant Group Training was an activity parallel to the others we have. The already working administrative routines could be used even for this training. According to the training system used within ASEA about two hundred different departments in the company have great experience in supervision of post-graduate trainees. Usually the staff have such a knowledge in the English language that it is quite possible to use this as a working language.

3. Accommodation

During the training period the participants have been offered to rent furnished flats, intended for one person and consisting of one room plus kitchenette and bathroom. The size of each flat is about 15-20 m². Linen is replaced every fortnight and each flat is cleaned once a week. Rents are 280-300 kronor (55-60 US \$) per month. Some of the flats are situated very close to ASEA's offices in the centre of the city, whereas others are a kilometre or two away. However, it has usually proved possible for ASEA to allow participants to choose the living quarters they prefer. This form of accommodation has meant that the participants have been independent. It proved, however, that many of them liked to associate with each other and lived in flats situated close to each other.

During the whole training period approximately 1/3 of the participants worked at the company's factories at Ludvika, 120 km north of Västerås. During days of programme common to all participants transport between the two towns was arranged by ASEA.

4. Climate and leisure-time activities

As the training starts during wintertime and the winter in Sweden can be rather severe, one should be aware of the fact that problems of adaptation can arise. This happened during 1966 course. The climate seemed to affect some of the participants mentally. The temperature outdoors was about 15-20°C below zero and people were obliged to resort to indoors activities, but because they were new in Sweden they didn't know the available leisure-activities. Anyhow, as far as we know, no severe problems appeared and after some weeks they got used to the conditions here in Sweden.

With regard to leisure-time activities, all the course participants joined the ASEA's student engineers association, in which both Swedish and foreign trainee engineers are members. The association arranges various types of meetings and events where Swedes and foreigners can meet and become acquainted with each other. The association has its own club room where members can play billiards or table tennis, watch TV or simply converse. In collaboration with ASEA, the association also arranges a number of lectures on technical and general subjects.

5. General views of the training

The intention of the training programme was to provide the participants, over a short period, with technical skills and practical experience which would have taken considerably longer to accumulate during their customary work in their home countries. In order that the reader may correctly interpret the programme presented below, we should like to clarify some of the principal aims of this training scheme.

Industrial development is not only a question of economic and technical resources within a country, it is also a matter of the level and capacity of education, of political and economic stability and a strong desire on the part of leading men in local and national government to support and promote long-term development programmes. We in the ASEA Educational Department consider it necessary to present industrial development in Sweden as well, so as to illustrate to the participants the conditions under which we work and the way our highly organised commercial and industrial life has been built up. It is important to know that the majority of Swedish industrial and commercial concerns are privately owned. In addition, certain national assets we have in our country must be taken into consideration. Only if Swedish industry is considered against the background of development during the last 100 years can an accurate picture of industry as it stands today be obtained.

It is a fundamental idea in this training that the participants after their return to their home countries will make use of the knowledge they have acquired during the training period in Sweden, taking into consideration the conditions and possibilities they have in their home countries. We believe that this will facilitate for them and less numbers of mistakes will be made if the course participants have got these widened views.

In order that practical training should be as purposeful as possible it is necessary to prepare in advance the departments where training is to take place. Using information placed at our disposal by UNIDO concerning the background and interests of each participant, we have therefore attempted, as far as possible, to plan training individually. During the first two days spent by the course participants at the company, we went through the programme with each individual, discussing it, and in some cases altering it.

We know from experience that adequate preparation gives better training results. Generally speaking the training requirements of the participants agreed with what was quoted in the reports we received from UNIDO. However, we consider that these personal talks have played an important part in the promotion of mutual understanding and the adaptation of the individual to the training programme.

6. Training programme

The training includes:

Practical training	about 60% of the total time
Theoretical training	" 40% " " " "

With practical training means engineering work and studies under supervision of experienced staff of ASEA.

The theoretical training includes:

- Introduction to Sweden and ASEA
- Lectures and seminar discussions
- Visits to industrial plants

Some of the lectures were voluntary. Most of these lectures covered technical subjects but here we also include a number of lessons in the Swedish language.

As already mentioned under point 5, the practical training was individual and as far as possible according to the interests of each participant.

The lectures and seminars were arranged to the whole group, but some of the subjects were chosen after we had found out the interests of the participants.


Our basic intention of the training has been to provide the participants with that knowledge they consider valuable for them and their countries.


For more details about the training programme, see Final reports from the 1966- and 1967-courses.

In next page you will find a time schedule for 1967 course.

THE UN-SIDA ASEA TRAINING COURSE 13 1967-3 7 1967

TIME SCHEDULE

 Working time within respective days

 Saturday and Sunday

MARCH

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Arrival at Ljubljana	Internal transfer from ASEA SIDA	General inform meeting in Ljubljana	Light evening meeting in Ljubljana	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA

APRIL

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA

MAY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA

JUNE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA	Study trip to LUDV/KA

JULY

1	2	3
Sum Return from Ljubljana	Sum Return from Ljubljana	Sum Return from Ljubljana

7. Experiences gained by ASEA from the courses

7.1 Qualifications of the participants

The age of the participants varied from 23 to 45. Even where the extent of formal technical schooling varied between the participants, their technical background was fully acceptable for these courses. In the case of the older members of the groups, knowledge acquired at school and since forgotten was compensated for by long practical experience. We obtained from UNIDO prior to the 1967 course far more details on the participants and their work and background than before the 1966 course. This has been of great value to ASEA in planning individual practical training. As stated previously, it is necessary to plan the latter before the participants arrive in Sweden. With a view to the fact that the participants came from 19 different countries with completely different political, economical and technical conditions, it would be unrealistic to imagine that the groups would be at all homogenous. Some of the participants had previous international experience; others had never been outside the boundaries of their countries. Those with greater experience have quite clearly been able to utilise the period of training here in a more effective way than the younger and more inexperienced members. In the 1967-group we picked out two of the participants as being less suitable for this type of extension course on account of their background and interests. They had in common the fact that in their own countries they had primarily occupied themselves with technical research within limited fields. They themselves considered the course too long to be considered as a series of information lectures and far too short to give them the opportunity to carry out intensive studies within special fields. It may also be true that research and development in their own countries in the fields in question are so advanced that their sojourn here was less rewarding than they had anticipated.

7.2 Linguistic ability

The official language during the courses was English. The ability of all participants to speak this language had been tested before leaving their home country. It seemed as if these tests had been somewhat perfunctory in certain countries. Certain of the participants had obvious difficulties in understanding and speaking English. This quite clearly reduced the opportunities of these people to participate actively in discussions and make full use of the courses. Some of the participants stated that they could have prepared themselves by means of language courses before leaving their home country, but that confirmation that they had been accepted for the course came only a few days before the course was due to start and gave no opportunity for such studies. This was valid especially for the participants in the 1967 course but also for some of them in the 1966 course. As was stated above under point 6, the participants were given the opportunity to learn some Swedish. Swedes are usually very willing to speak English to foreigners and for this reason course participants had limited opportunities to practise speaking Swedish. Consequently it seems hardly likely that these Swedish language lessons were particularly useful during the training course, but, on the other hand, the course participants clearly found it helpful and enlightening to be able to speak Swedish outside working hours.

7.3 Personal conduct and adaptation to Swedish conditions

Despite being situated in a completely foreign environment and despite relatively strict supervision on ASEA's part in order to ensure that the course would be as purposeful as possible, all participants displayed great understanding and ability to adapt themselves. As far as we know, adaptation to Swedish conditions did not constitute any severe problems for the participants.

7.4 Common experiences

As being an international concern, we have engineers from all parts of the world here for training purposes. In respect of the training of a given group, the qualifications of the participants as well as the purpose of the training in question must be taken into consideration. Consequently the degree of experience that the engineers have of industrial work must be considered. The more experienced the participant is, the more individual training is required. As pointed out before, the groups we have here for in-plant group training have very little in common with regard to background and origin. In addition, industrial development has progressed unevenly in various countries, depending on the structure of the country, for example. In this way we have experienced a concentration on various groups of products and types of plant which differ from country to country. Furthermore, the personal interests of the participants must be catered for. There are many more factors which affect the shaping of the programme. When a training scheme as costly as this is established, it must be the aim of the course leaders to make training as effective as possible for each participant. Certain changes have been made in respect of the 1966 course in order to improve the efficiency of training in the 1967 course. The greatest changes made in the course programme are first, that all basic information on Sweden and ASEA is concentrated at the beginning of the course. In addition, discussion groups have been arranged during the course covering important products and groups of products within the field of power technology. Thanks to daily contact between the participants and the course leaders, and constant attention to the trainees' views on the course, it has been possible to accommodate most requirements by means of changes in the latter part of the programme. Criticism from participants has mainly concerned practical training. Concerning the 1967 course, as is shown under point 6, the total period of practical training during the 17 weeks of the course only amounted to 46 days. This corresponds to only 9 ordinary working weeks. Direct contact with the problems facing engineers is essential in this type of training. Practical experience is thus considered to be of primary importance in in-plant group training. We were fully conscious of the fact that the length of the 1967 course was far too short even before the course started. Individual views on the extent of skilled guidance during practical training were also expressed. Certain participants required continual guidance, whereas others considered that independent studies supplemented by discussion in groups headed by qualified technicians is a better solution. There were also those who considered that practical training should be carried out in groups of two or three individuals. This is a further illustration of the difficulty of providing individual training which satisfies each participant in every respect. It is, of course, of great value to us to obtain the views of the participants on the training programme. Their views can also be of assistance to us in planning future training schemes in order to improve them and make them more efficient.

7.5 Views regarding future courses

Experience tells us that training of this nature should extend for 5 to 6 months. Bearing in mind public holidays and the general industrial activity we consider that the period February to June 1961 and should be selected.

During theoretical training, which includes lectures and seminar discussions on various technical subjects and administrative and organisational matters, it is important that all the participants present should take part as actively as possible. This presupposes that the participants have industrial experience and interests outside a limited technical area. Furthermore, they must have the desire and the opportunity to pursue and assist planned industrial development in their own countries and the ability to assimilate and utilise those aspects of training here which are particularly applicable to their own special conditions. When selecting material for future courses, the above views should be taken into account.

This implies that engineers who have experience of research and who are primarily interested in extending their technical knowledge of specialised fields during their continued studies should preferably be recommended for grants for special studies in their fields, rather than for courses of this nature.

With regard to the final selection of participants, this should be completed at least one to two months before the start of the course. This in order that participants should have time to prepare themselves for their stay in Sweden. For example, they should be encouraged to contact engineers who have participated in previous courses and are familiar with course conditions. Certain of those selected may require special training in the English language.

Finally we should like to emphasize the importance of information about Sweden and the host authorities before the participants leave their home countries. ASEA are very willing to supply information to selected course participants if any of them so require.





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