

# Operating a training programme for technologists for a new paper mill

RAMACHANDRAN, P. N., SINGH MAN MOHAN & AGRAWAL, N. R.

The function of the technical training department of any industry is to train new recruits for specified jobs, to train the existing man power to assume higher responsibilities as and when required and to acquaint them with the latest developments in their field, so that they can catch up with modern technology. Orient Paper Mills has been conducting technical training programmes for various levels of personnel such as craftsmen, graduate/technician apprentices and Pulp and Paper mill operators. Recently the mill has imparted technical training to middle management level technologists from Overseas for a new Pulp and Paper Mill. The aim of this training programme has been to equip these trainees with sufficient theoretical and practical knowledge of the operation and maintenance of Pulp and Paper making equipment so that on their return to their country they will be able to take over from expatriate staff after some further training during construction, start up and operational phase of the new mill. In the past three years we have trained 28 technical trainees for various sections of the mill such as pulping, Stock preparation and paper making, chemical recovery, utility, mechanical and electrical maintenance, instrumentation, central laboratory and training. The common features of these training programmes along with the details of training of one particular group of Overseas trainees viz, chemical recovery, are outlined in this paper.

## TRAINING OF CRAFTSMEN :

Craftsmen are the backbone of any industry. Realising the importance and necessity for training such people, O.P.M. has been training craftsmen from its very inception. With the implementation of the Apprenticeship Act, this facility has been extended to several trades and to a large number of trainees. The present intake is 80 trainees per session in 11 designated trades namely Fitter, Weld0r, Turner, Mechanist, Moulder, Motor Mechanic, Diesel Mechanic, Draughtsman (Mech), Electrician, Wireman and Instrument Mechanic.

The input consists of trainees who have already completed their basic training in Industrial Training Institutes and also fresh recruits. The I.T.I. passed candidates receive shop floor training in their trades whereas the fresh recruits receive both basic training and shop floor training in our Workshops. In addition to on the job training the trainees also attend related instruction classes in Trade theory, Engineering drawing, Workshop calculations and Science and social Studies according to prescribed syllabus. At the end of the full term apprenticeship the trainees appear in the All India Trade Test conducted by the National Council for Training in Vocational Trades. Successful candidates are awarded trade certificates by the Council and become qualified to work as skilled craftsmen in their respective trades.

## TRAINING OF GRADUATE/TECHNICIAN APPRENTICES

The Apprenticeship Act 1961 was amended in 1973 to cover graduate engineers and diploma holders also. Under this scheme engineering graduates and diploma holders are given on-the-job training for a period of one year. We recruit 6 trainees every year in the areas of Mechanical, Electrical and Chemical Engineering and Pulp and Paper Technology. The trainees are assigned to specific departments to receive practical experience in the operation and maintenance of various equipments. At the end of one year's exposure, successful candidates are usually absorbed in the regular cadre of the factory as Assistant Engineers/Supervisors.

## TRAINING OF OVERSEAS TRAINEES

Recently the mill has taken up the task of training middle management level technical personnel for a new pulp paper mill abroad. The salient features of this training programme are outlined in the following paragraphs.

The total duration of the training is 44 weeks shared among our two mills-one at Amlai (for 26

\*Orient Paper Mills, Amlai

weeks) and the other at Brajrajnagar (18 weeks). The details of the trainees such as their educational qualifications, practical experience and specific exposure to pulp and paper making field are received 5-6 months before their arrival here for training. This enables us to prepare the programme to match the back ground of the trainees so that the time at our disposal is most effectively utilised. Reading material such as manuals and lectures notes are then prepared in consultation with the department personnel and kept ready to be distributed to the trainees on their arrival.

The programme at Amlai is divided into 3 parts-An orientation and familiarisation period of 1 week, a broad based training in all the sections of the mill for a period of 12 weeks and an intensive training for the rest of the period in the specific department in which the trainees have to take up responsibility in their mill.

The orientation and broad based training are common to all trainees, whereas intensive training is different for each category. The orientation is meant to locate various units of the mill and to meet various plant personnel with whom they have to work later on. The broad based training is intended to equip the trainees with a sound knowledge of all aspects of pulp and paper making irrespective of their area of specialisation. During this period they spend a week or two in each section of the mill and learn the function and interconnections of various parts of the unit. At the same time they also receive regular general lectures on pulp and paper making on a wide spectrum of topics such as wood preparation, pulping methods, preparation of bleached and unbleached pulp, chemical recovery, stock preparation, paper machine, power generation and distribution, water and waste treatment, quality control etc. when the broad based training is completed the trainees become sufficiently prepared to take up in depth study of the particular section to which they are to be assigned later on. The intensive training consists of detailed study of all equipments and their interconnection and also shift work to learn the operation of various equipments. The areas in which knowledge is gathered include hazards and safety precautions, pre-start up operations, start up and trial runs, routine operation, shut down procedures, emergency stoppage of plant and equipments and controls and instrumentation. Specialised lectures on these topics are also covered during the early part of the intensive training. To give an example, such special lecturers covered for chemical recovery trainees include Mixed effect evaporators; Heat transfer in evaporators; Scaling in evaporators; Evaporator accessories; Start up, shut down and trouble shooting in evaporators; Types of recovery furnaces; Furnace accessories;

Black liquor combustion; Secondary recovery system; Furnace heat balance; Boiler mountings; Start up, shut down and emergency shut down; Troubles and remedies for furnace; Theory of causticizing; white liquor clarification; Lime mud filtration; Mechanical maintenance in Soda recovery plant etc. The general schedule of training and special lecture topics for trainees in Soda Recovery plant are shown in appendix 1 and 2 respectively.

The training at Brajrajnagar also is on similar lines, emphasis being placed on the study of the equipment details, layouts etc of the actual plant abroad. This enables the trainees to apply the theoretical and practical knowledge that they have gained at Amlai to fully comprehend their actual plant and machinery.

An essential part of this training is industrial tours to various manufacturers of pulp and paper mill equipments and accessories located all over India and to some other paper mills. This enables them to strengthen their knowledge by seeing the fabrication of equipments needed in a pulp and paper mill.

Thus at the end of 44 weeks of training here the trainees get a sufficiently good exposure to the art of paper making. On return to their own mill they will receive further training during construction and start up of the mill followed by operational phase training for 2-3 years, when they become competent to take over from expatriate staff and also to train fellow colleagues who will be joining them at various stages of the operation of the mill.

## CONCLUSIONS :

In addition to imparting training to craftsmen, technician and graduate apprentices under the Apprenticeship Act, Orient Paper Mills, Amlai has taken up the challenging task of training middle management level technologists for various sections of a new pulp and paper mill abroad. These personnel have been so trained not only to assume responsibilities of their own departments but also to train juniors who will be joining them later on.

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## TRAINING SCHEDULE FOR SODA RECOVERY SHIFT FOREMEN

Week	Practical work	Lectures
<b>A. ORIENTATION</b>		
1.	Orientation	
<b>B. BROAD BASED TRAINING</b>		
2.	Chipper House	Wood Preparation Chipping Screening Storage
3,4	Pulp Mill	Pulping Methods Digestion Washing Screening Bleaching
5.	Soda Recovery	Black Liquor Evaporation Black Liquor Burning Causticizing
6,7,8	Stock Preparation & Paper Machine	Refining, Sizing, Dyeing Wire Section Press Section Dryer Section Calendering Rewinding, Cutting & Finishing.
9,10	Power House	Power Generation Power Distribution Water Demineralisation
11	Water and waste water treatment	Effluent Characteristics Effluent Treatment Water Treatment
12	Laboratory	Sampling and Analysis Quality control
13.	(Industrial Tour)	
<b>C. INTENSIVE TRAINING</b>		
14,15	Detailed Study of Evapo- rator Section	Special Lectures on Evaporator Section
16,17	Detailed Study of Furnace	" " Furnace Section
18,19	" " Causticizing Sec.	" " Causticizing Section
20,21	Shift working Evaporator Sec.	
22,23	" " Furnace Section	
24,25	" " Causticizing Sec.	
26	(Industrial Tour).	

**SPECIAL LECTURE TOPICS FOR SODA RECOVERY TRAINEES**

1. Mixed Effect Evaporators-Theory and principles
2. Heat Transfer in Mixed Effect Evaporators
3. Scaling in Evaporators and its Remedies
4. Evaporator Accessories
5. Evaporator start up, shut down and trouble shooting
6. Function and types of Recovery Furnaces
7. Furnace Accessories
8. Black Liquor Combustion
9. Secondary Recovery System
10. Boiler Mountings
11. Heat Balance of Recovery Furnace
12. Preparation of Annual Boiler Inspection
13. Start up, shut down and Emergency shut down of Recovery Boiler
14. Troubles Shooting in Recovery Boiler
15. Theory and Practice of Causticizing operation
16. White liquor Clarification and Lime Mud washing
17. filtration of Lime Mud
18. Mechanical Maintenance of Soda Recovery Plant
19. Soda Recovery Plant Instrumentation.