

TRAINING PROGRAMME FOR ETP OPERATORS IN THE TEXTILE INDUSTRY

Promotion of Sustainability in the Textile and Garment Industry in Asia - FABRIC

A photograph of an aeration tank in a wastewater treatment plant. The water is dark and turbulent, with large amounts of white foam on the surface. A metal walkway with yellow railings is visible on the left side. The scene is brightly lit, suggesting an outdoor or well-lit indoor facility.

Course introduction

GIZ FABRIC – ETP Operator Course

Basic context of course

Basic context of course

- Effluent treatment plant = Facility to treat wastewater.
- Purpose: To remove pollutants in wastewater to national and internationally required levels before being discharged.
- ETP employing
 - physical, chemical or biological treatment methods to treat wastewater.
 - removing pollutants like BOD, COD, TSS, metals etc. and making wastewater pH neutral.
- Depending on degree of treatment wastewater can be recycled and reused.



Basic context of course

ETP operator

- operates, maintains and monitors operations of ETP as per operational requirement.
- works in three shifts, with senior staff in general shift.
- is most important person in ETP → A bit carelessness can destroy entire functioning of an expensive ETP.
- Background can vary from basic to technical qualifications.



ZDHC guideline for ETP operator

- **Zero Discharge of Hazardous Chemicals (ZDHC)** = Initiative by group of apparel brands and retailers working together to lead the industry towards zero discharge of hazardous chemicals.
- ZDHC specified guidelines for operator qualification levels divided into multiple categories: Levels 1 through 5, and Levels 1A, 2A, 3A, 4A, and 5A for those operators of ETP with activated sludge technology.
- The qualification scores for ETPs specified based on its complexity; a detailed score card available for calculating the score.
- The complexity score is based both on capacity of the ETP as well treatment units available in the ETP.

Ø ZDHC



ZDHC guideline for ETP operator

- The Z-category exists for the most-experienced operators at Level 5 working on zero liquid discharge (ZLD) systems.
- For operators to qualify to higher level, they must satisfy all respective requirements of lower qualification levels.
- Each level of 1 - 5 have an advanced level too (1 and then 1A, 2 and then 2A and so on).
- Rather than educational, ZDHC guidelines qualifies ETP operators based on their hands-on experience in ETPs
- Qualification required for operator depends on complexity of the wastewater treatment system.

Ø ZDHC



ZDHC guideline for ETP operator

Levels of operator qualifications awarded based on demonstration of knowledge levels:

- Demonstration of knowledge levels to be determined based on the number of years of hands on experience an operator has on different treatment units.
- For instance an operator with 3 years experience in an ETP with basic and advanced primary treatment considered eligible for level 3.
- An operator with 3 years experience in ETP with primary & secondary biological treatment be awarded with 3A score.



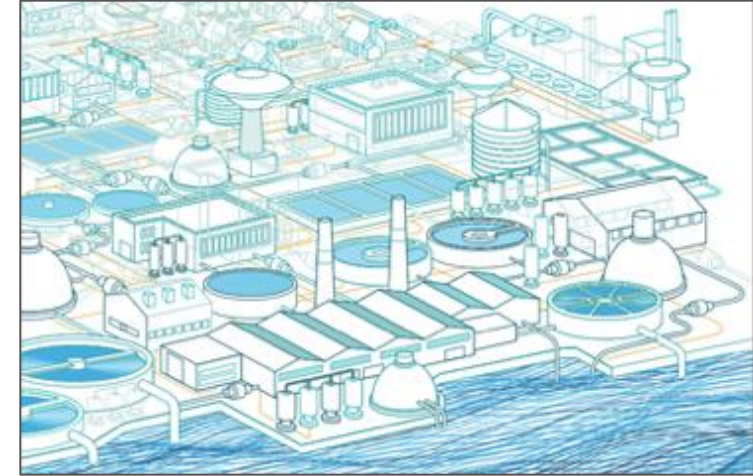
ZDHC specified qualification for ETP operator (Contd.)

- Formal education is counted as additional years of experience.
 - For instance, a 4 year bachelors science degree is considered equivalent to two years' experience.
- In future, every ETP operator is expected to have the qualification based on this guidelines to be considered eligible for appointment or continuation in the job.
- For that they need to submit the qualification as per the format & undergo a multiple choice knowledge test.
- This training program, inter-alia, aims to provide you with the knowledge level as per ZDHC requirements.

Purpose of course

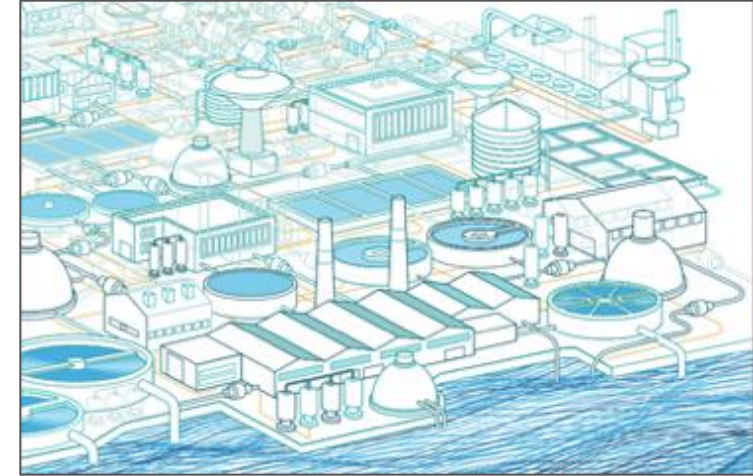
Purpose of course

- Getting trained in topic of work makes you a valuable asset to the factory.
- As trained operator you can also get better future within the factory and a better future opportunities by getting trained.
- Now stakeholders are coming up with qualification criteria for ETP operators. In future, un-trained operators may not be preferred.
- ETP has many safety risks. Proper training on the safety issues and precautions to be taken for it saves many lives.
- Having proper training on the common problems and trouble shooting measures enable you to be better prepared for such issues.



Purpose of course

- Most operators are placed in an ETP based on availability, not their knowledge in ETP operations.
- Many operators think that their job is only confined to switching on or off pumps and machines.
- Training helps operators to do their job properly and to know why they are doing a particular action.
- Knowing the basic principles of different operating units helps the operators to control their process much better.
- Getting trained on basic spot-checking (e.g. jar tests, MLSS settling, pH or DO) enables the operators to optimize the ETP operation.



What do you gain from participating in this training



- ✓ Knowledge is power - always.
- ✓ You would be made aware what are the units in ETP and how and why you should do an operation step in ETP. Not much theory though!
- ✓ You will get basic idea about the legal requirements of wastewater management.
- ✓ It will teach you how not to waste chemicals, how to produce lower quantity of sludge.
- ✓ It will teach you how to manage a biological treatment system.

What do you gain from participating in this training



- ✓ You would be taught what to do in an emergency situation in the ETP
- ✓ You will know the common problems in ETPs, how to prevent it and how to manage it if occurs.
- ✓ You will be taught what are the safety risks in the ETP and how to prevent it.
- ✓ You will learn what are the records to be maintained by the operator and how to generate useful data out these records.

Course objectives and concept

Overall objective of the programme

- To create a pool of qualified operators for managing ETPs in Bangladesh.
- To empower operators with knowledge about the functioning of each unit of the plant, its operation & maintenance aspects and what they should ensure in the unit.
- To enable the operators to meet the knowledge and competence criteria as suggested by the ZDHC guidelines.
- To instil confidence in operators and motivate them to carry out job as operators more effectively.



Course concept and overview

Training approach and concept

- Focus on practical requirements and needs of ETP operators' work and tasks and on less theory
- Review and reflection on each treatment unit, with explanation with units' details, functioning, operational steps, mechanical maintenance, electrical maintenance, do's and don'ts and record keeping.
- Exercises to support translation of training inputs into practical application at ETP level
- Combined with visits to operational ETPs (if feasible)

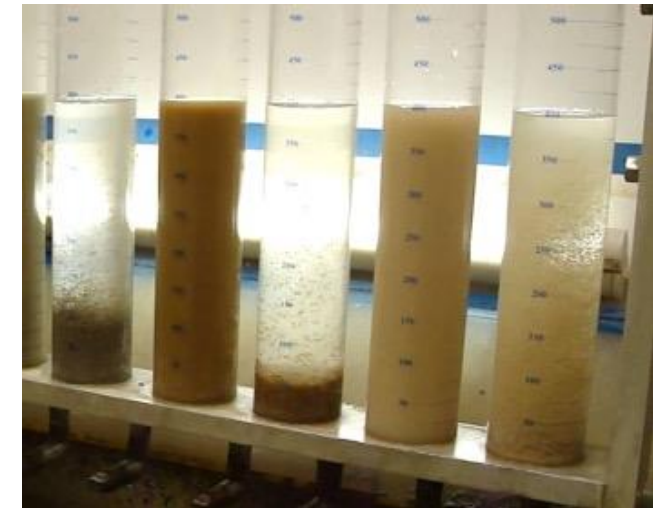
Overview of topics covered

- General ETP scheme
- Primary treatment
- Secondary treatment
- sludge management
- Monitoring
- Safety & health
- Trouble shooting
- Tertiary treatment & membrane based treatment

Expected outcomes of this training

The training programme will...

- orient operators how to properly carry out routine ETP operations, e.g. what to do for chemical treatment, how to calculate and adjust chemical dosage, at what frequency the sludge should be removed etc.
- guide operators what immediate trouble shooting to do in ETP, e.g. what to do in case sludge in the clarifier is coming up instead of settling.
- advise operators what kind of records should be maintained within the plant and how to compile the same.
- inform operators about safety risks (e.g. hydrogen sulphide gas, electrical/chemical hazards) and what to implement as precautionary steps as well as immediate first aid measures to save a life in case of an emergency in the ETP



Specific learning outcomes

At the end of this training, you will be able to

- apply enhanced good practices in the ETP operation and avoid bad practices
- prevent safety problems in ETPs and reduce number of accidents in ETPs.
- optimise the functioning ETPs by adjusting the treatment performance and managing common problems in the ETP by applying appropriate remedial measures.
- operate the ETP at optimal inputs, thus saving money in ETP operation and maintenance, thus benefitting the factory management.



Programme for Days 1 & 2

Module	Content
Module 1	Importance of water & effluent management
• Topic 1	Importance of water, need for water in Bangladesh textile industry
• Topic 2	Legal requirements (current and emerging)
• Topic 3	Pollutants & hazardous material in effluent - sources, characteristics, general Impact of these pollutants, Definition of terms like pH, DO, BOD, COD, TSS, TDS, Sludge etc.
Module 2	Introduction to effluent treatment
• Topic 1	Basic concept of effluent treatment
• Topic 2	Effluent treatment schemes in Bangladesh
• Topic 3	Roles, responsibilities & duties of ETP operators
• Topic 4	Standard ETP operating procedures
• Topic 5	Optimization of ETPs

Mode of delivery:

- Presentations
- Group discussions
- Exercises
- Home works

Programme for Days 3 & 4

Module	Content
Module 3	Primary treatment
• Topic 1	Objective, function and details of primary treatment.
• Topic 2	Control of primary treatment
• Topic 3	Chemicals used in ETP & function of treatment chemicals
• Topic 4	Control of chemical treatment
• Topic 5	Importance of jar tests and how to fix chemical dosing
Module 4	Secondary treatment
• Topic 1	Objective, function and details of secondary treatment
• Topic 2	Biological treatment techniques (aerobic & anaerobic)
• Topic 3	Different type of aeration systems and settling units
• Topic 4	Control of biological treatment processes
• Topic 5	Importance of DO, SVI, MLSS, nutrients, RAS, WAS

- Mode of delivery:
- Presentations
 - Group discussions
 - Home works
 - Demonstration of chemical dosing

Programme for Days 6 & 7

Module	Content
Module 5	Sludge management
• Topic 1	Sources of sludge, legal requirements of handling and disposal of sludge
• Topic 2	Sludge dewatering techniques and different equipment used
• Topic 3	Storage and disposal of dried sludge
• Topic 4	Minimum tests for sludge and record keeping
• Topic 5	Approaches for reducing sludge volume
Module 6	ETP monitoring
• Topic 1	Importance of monitoring, record keeping & data processing
• Topic 2	Sampling techniques, sample point selection, sample preservation & transportation
• Topic 3	Analysis of different parameters and test procedures for major parameters
• Topic 4	Record keeping and how to prepare proper monitoring plan
• Topic 5	Online monitoring (need, methods and basic requirements)

Mode of delivery:

- Presentations
- Group discussions
- Exercises
- Home works

Programme for Days 9 & 10

Module	Content
Module 7	Health & safety at work in ETPs
• Topic 1	Introduction to OSH and importance of safety & health measures
• Topic 2	Common safety & health risks in ETP & their prevention
• Topic 3	Controls (PPEs, sign boards, safety in handling chemicals)
• Topic 4	Confined space accidents and prevention
• Topic 5	First aid practices for ETP operators
Module 8	ETP maintenance and trouble shooting
• Topic 1	ETP maintenance, preventive & break down maintenance
• Topic 2	Common problems in primary treatment and management of same
• Topic 3	Common problems in biological treatment and management of same
• Topic 4	Common issues in secondary clarifier and management of the same

Mode of delivery:

- Presentations
- Group discussions
- Exercises
- Home works

Programme for Days 11 & 12

Module	Content
Module 9	Tertiary treatment & general operation steps
• Topic 1	Tertiary treatment systems - filtration
• Topic 2	Tertiary treatment - oxidation.
• Topic 3	Operation-rounds in ETP (Part 1)
• Topic 4	Operation-rounds in ETP (Part 2)
Module 10	Advanced treatment systems & re-starting of an ETP
• Topic 1	Membrane based effluent treatment
• Topic 2	Restarting of ETP
Exam	Written examination to evaluate the ETP operator trainee

Mode of delivery:

- Presentations
- Group discussions
- Exercises



Basic course rules

Basic rules for training programme completion



- ✓ Be punctual, always keep the timing. Show due respect to the training programme.
- ✓ Fill up the quiz forms and home works, submit the same on time.
- ✓ Take exams seriously.
- ✓ Keep decent attire, be ready with books, pen etc.
- ✓ Be respectful to other participants and allow their privacy.
- ✓ Be attentive and try to learn as much as possible.

Basic rules for training programme completion



- ✓ Participate actively in interactive sessions & group discussions.
- ✓ Do not hesitate asking questions to the trainer whenever you have a doubt.
- ✓ During ETP visits, always stay with your group, do not interact with personnel in the factory and do not enter or touch areas other than you are allowed.
- ✓ Try to get practical tips from the managers of the ETP being visited.
- ✓ Always follow the Covid protocol as applicable.

Course evaluation

How do the trainers evaluate the participants

- **Level of participation**

- Showing up on time for sessions, being attentive all the time and always ask the right kind of questions make a good impression on the trainer.
- Active participation in group discussions and sharing of ideas

- **Participation in and completion of exercises**

- Completing student exercises
- Correct answering and solving of exercises

- **Completion of homework assignment**

- Answering and submitting on-time of weekend assignment

- **Passing written exam**

- Successfully completing written exam on final day of training programme (multiple choice questions & objective type).
- Exam results and the grades of trainees to be announced on same day.



Evaluation criteria

- There will be 12 days of course including two days' of ETP visits. Absence of more than two course days will result in person not able to receive course certificate.
- Marks based on the following criteria:
 - Attendance & behavior: $12 \times 3 = \text{max } 36 \text{ score}$
 - Exercises: $7 \times 2 = \text{max score } 14$
 - Final Exam : $1 \times 50 = \text{max score } 50$
- There will be A and B grades for the certificates.
 - Persons who score 60 and above shall be given A grade certificate
 - Persons who score between 40 and 60 shall be given B grade certificate.
 - Persons who score less than 40 will not get a certificate.

Conclusion

- After training, the operator is not just another labour, deputed from one section to another - he will be a skilled person.
- It makes him operate the ETP better and more efficiently - it would give a professional satisfaction.
- Even if he takes up job in another industry in future, knowledge gained through this training would be useful.
- A trained operator commands more respect, boosting self confidence.
- The training would condition him to take precautionary measures against accidents, it will enable him to quickly react to emergencies when it occurs.
- When visitors come to your plant, with the knowledge gained he can interact with them more effectively.
- Above all, the feeling of self-importance after the training will be a major benefit.

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