SUMMER TRAINING REPORT

(Abridged)

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Abstract

This report summaries my learnings and experiences during Summer Training, undertaken at M/s. Yara Fertilisers India Pvt. Ltd., Babrala, U.P.
The duration of this Summer Training was of one month, from 16th June 2018 to 16th July 2018.

About Yara

Yara Fertilisers India Pvt. Ltd. is the Indian subsidiary of Norway based Yara International ASA, the world's leading supplier of mineral fertilisers, headquartered at Pune, India.

The urea manufacturing plant of Yara, located at Babrala, U.P., was recently acquired from Tata Chemicals Ltd. in the year 2018. This venture is the first foreign direct investment in the highly regulated urea sector. Urea produced by this plant is marketed under the brand name Yara Vera.

A glance at Yara, Babrala

Located at Babrala, Sambhal Dist., Uttar Pradesh, Yara Fertilisers is amongst the most energy-efficient fertiliser plants in India.
The fertiliser complex consists of the urea plant and a lush green colony for housing its employees.

Entry into the plant premises and subsequent training

A trainee is first checked for his offer letter issued by the HR department, at the security office. After being found satisfactory, the trainee is then sent to HR department for verification of certificates and consent letter of the academic institute. On successful verification, he then fills out a form requesting for his gate-pass, for a duration of his training period. The trainee is then issued gate-pass by the security office and is sent for fire and safety training at the fire station. On successful completion of fire and safety training, the trainee is handed over the PPEs and is then assigned a mentor for his training at the plant. He is then supposed to report to the mentor henceforth.
The trainee is allowed for entry into the plant during stipulated work hours and gets acquainted with various skills, processes, equipment and personnel during his training. At the end of the training, he is supposed to submit a report to the HR department.

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Project assigned

Title: An Overview of Mechanical Maintenance and related processes
Project Guide: Mr. Dhananjay Singh

Fire and Safety Training

For any industry to function smoothly, achieve its production and corporate goals, it is must that the industry has a strong fire and safety policy.
Fire accidents amount to a huge loss of inventory, equipment, machinery and most importantly, it leads to loss of valuable lives of the employees.
Also, the accidents caused due to improper safety measures lead to fatality or lifetime physical disability of the victim.
These accidents sum up to the net monetary and human capital loss, which is highly undesirable to both the industry and the employee.
In view of the above considerations, fire and safety training is imparted to each and every person who enters the factory premises.

An overview of the plant

A journey from Natural Gas to Urea

- Natural gas (NG) is supplied to the plant by a GAIL pipeline.
- It is cracked at the reformer to form hydrogen, carbon monoxide and carbon dioxide.
- These gases are then sent to the shift converter which converts carbon monoxide to carbon dioxide.
- After that they pass through G.V. reactor where carbon dioxide is absorbed and hydrogen is sent for the further process.
- Nitrogen is obtained from air and is pressurised to react with hydrogen obtained from NG to form ammonia in the liquid form.
- Carbon dioxide obtained from G.V. reactor is then sent to the reactor column where it reacts with ammonia to form urea in the liquid form.
- Liquid urea is sent to the prilling tower, where it solidifies to form urea prills.

The power required for running all these machinery is obtained from a NG fired gas turbine.

Mechanical Maintenance

Maintenance involves operational and functional checks, servicing, repairing or replacing of necessary devices, equipment and machinery in the industry.
Any maintenance activity can be classified into the following categories:

- **Preventive maintenance**

It is carried out with the intent of avoiding failures, safety violations, unnecessary production costs and losses, and to conserve original materials of fabrication.

- **Corrective maintenance**

Corrective maintenance is a type of maintenance used for equipment after equipment break down or malfunction.

- **Predictive maintenance**

This maintenance strategy uses sensors to monitor key parameters within a machine or system, and uses this data in conjunction with analysed historical trends to continuously evaluate the system health and predict a breakdown before it happens. This strategy allows maintenance to be performed more efficiently, since more up-to-date data is obtained about how close the product is to failure.

Condition Monitoring

Condition Monitoring is the process of monitoring a parameter of condition in a machinery in order to identify a significant change, which is indicative of a developing fault.

The task of the Condition Monitoring Cell (CMC) is to carry out various tests and inspections which form the first step in preventive maintenance. Also, these tests carried out over a period of time form the basis for what would be known as predictive maintenance.
In simpler words, CMC does the health check-up of the machinery and equipment of a plant.

Operations and Maintenance Works

During my training here, I was stationed at Mechanical Site Workshop.
I got the opportunity to learn about the function and maintenance of various machines, equipment and instruments. To name a few, a variety of pumps, valves, compressors, components of gas turbine, boilers and reactor vessels were under scheduled maintenance. I learnt about various processes and techniques adopted in O&M works, pertaining to both technical and organisational aspects. I also undertook frequent field visits to learn about various units of the plant viz., reformer unit, off-site and utility (consists of power plant, cooling towers and DM plant), compressor house, ammonia unit, urea unit, packing plant and central control room.

My learnings at Yara

Yara Babrala is my first tryst with industry.

At first, I had a little doubt as to how I would mould into the industrial environment, having just completed my second semester and fairly being a novice to the core subjects of mechanical engineering. However, as the time had passed by at Yara, I became confident in understanding the way industry works. I had gained good practical experience of the machinery used in various processes and now it is more interesting than ever to learn about these machines theoretically, in my future courses.

The Mechanical Site Workshop is always a busy area with the engineers and personnel working on various plant equipment, doing their maintenance and seeing to it that the equipments get maintained with the best of their efforts. The atmosphere here is such that everyone learns something from his job, shares that knowledge with his colleagues and mutually develop their skills. I was overwhelmed to see this great learning culture at Yara, founded by Tata. I am really blessed to be a part of this team for a month.

The plant premises is well planned, green and safe. One could imagine sitting in a lawn while the plant produces urea, such is the greenery here. Another interesting thing I had observed is that every employee here focuses heavily on safety and there are safety slogans on boards, safety signs, escape routes, emergency assembly points everywhere in the plant. It is thus no wonder that this plant has been accident-free for many years. All the machinery and equipment in the plant are tagged. This facilitates greatly for their operation and maintenance. All the departments are well-coordinated and run the plant so. Any deviation from rules/regulations is taken seriously and is seen to it that it does not recur. There are training sessions held regularly for the employees for enhancing their skills and enabling them to deliver performance efficiently. The employees and the plant as a whole constantly strive for improvement. These things help this plant set world-class standards in the fertiliser industry.

Yara has introduced me to the industry, by setting the standards high. The values, lessons, standards and knowledge that I learnt here will help me all throughout my endeavour in becoming a good engineer.

END OF THE REPORT