INDUSTRIAL TRAINING REPORT I I

TRAINING ORGANIZATION : NORITAKE LANKA PORCELAIN

PERIOD OF TRAINING : FROM 25/02/2019 TO 05/05/2019

FIELD OF SPECIALIZATION: MECHANICAL ENGINEERING

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E/14/369

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KY Kiken Yoshi

Chapter 1

INTRODUCTION

1.1 TRAINING SESSION

This training session was covered as per the requirement of the completion of the 10-week internship program at the end of the third year as a part of the B.Sc. Mechanical Engineering degree programme. Training was conducted at Noritake Lanka Porcelain (Pvt) Ltd, Matale. The 10-week training programme was from 25/02/2019 to 05/05/2019.

1.2 INTRODUCTION TO THE TRAINING ORGANIZATION

Figure 1.1 Noritake Logo

In 1904 a factory was founded by baron Ichizamon Morimura was established in Nagoya, Japan under the name of NIPPON TOKI KAISHA Ltd. This company established in Japan grew to be named as Noritake which went into a joint venture with Ceylon Ceramic Corporation in 1972, which was then the leading porcelain manufacturer in Sri Lanka. The joint venture enjoyed a lot of success, which led to creating of a well spread culture of porcelain manufacturing in Sri Lanka. This success and the deeply rooted culture lead to the complete acquisition of the venture by the Japanese parent company and was named as Noritake Lanka Porcelain (Pvt) Ltd in 1990 which remains unchanged to this date.

The main factory is situated in Warakamura, Matale which is responsible for most of the production while another factory is located in Pannala, Kurunegala which handles decorations. Noritake also has showrooms located in Wattala, at the factory outlet in Matale and another in Colombo 07.

Noritake Lanka Porcelain (Pvt) Ltd mainly produces tableware while other branches of Noritake scattered around the world are responsible for the production of electronics and other ceramic wares. An estimated amount of 900,000 pieces are produced each month. While 80% of these are exported worldwide the rest is distributed inland in which most of the products are distributed supplementing the tourism industry. Noritake Lanka boasts a permanent staff of 1240, while supplementing the production process with a temporary staff of 250. Noritake Lanka follows an integrated management system since 2015.

1.2.1 Organizational structure

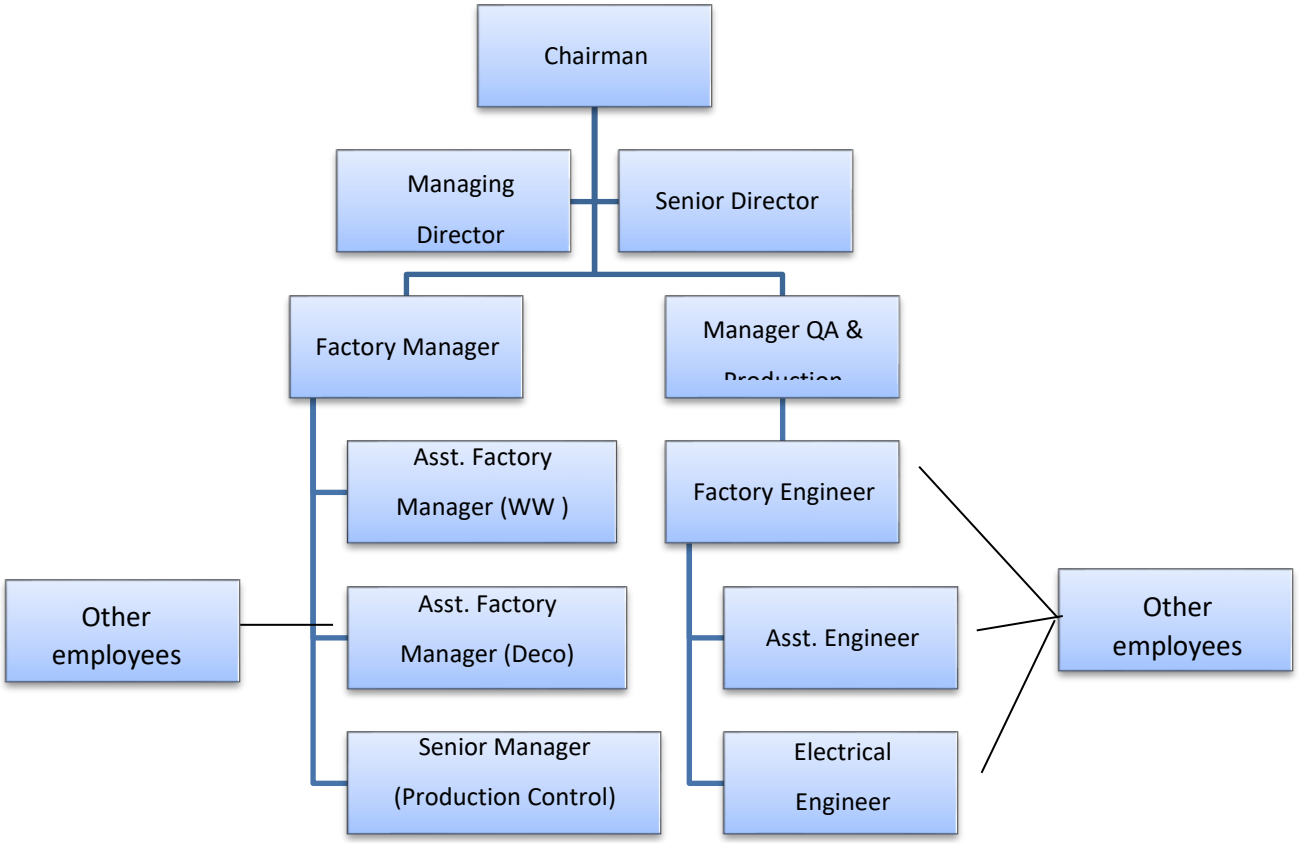

Figure 1.2 Organization Chart

1.2.2 Mission

Noritake Lanka Porcelain Private Limited is the pioneer porcelain tableware manufacturing conglomerate in Sri Lanka. The Company was established in 1972 as a joint venture company between Ceylon Ceramic Corporation and Noritake Co., Limited of Japan. Noritake Co., Limited of Japan is a hundred years old company which markets tableware under the brand "Noritake" all over the world.

The Company's production facility is located in Matale where country's rich minerals such as quartz, feldspar and dolomite deposits are spread. Factory operates with the production systems developed by the parent company in Japan. There are several Japanese technical advisors' station in the factory to monitor production process to ensure products are manufactured in par with the international quality standards. The factory started its operations in 1972 just with 150 workforce and as at today workforce stands with 1200 skilled workers. Some of the workers, supervisors and managers of the factory are trained in Japan in their relevant fields.

Since the inception, company went with several expansion programs by investing nearly 1 billion rupees to increase the production facility from 3,000 sets to 12,000 sets per month. In year 2008 the Company invested Rs.160 million to introduce a plant, which produces Bone China Tableware. Bone China Tableware is regarded as the most expensive tableware in the world and this company is now the pioneer in this segment in Sri Lanka.

1.2.3 General function of the factory

The main factory of Noritake Lanka Porcelain Private Limited has several departments as follows, in order to complete the production process.

- Preparation Department.
- Forming Department.
- Glazing Department.
- Decoration Department.
- Inspection Department.

Other than those departments, the maintenance department, which we, the engineering trainees were attached to, oversees the maintenance procedure of the entire factory weather it is production related or not. The Human Resource Department looks into the employees and their needs while keeping records of salaries. The Finance Department looks into the finances and accounts of the organization. The IT Department looks into IT related breakdowns and other activities.

1.2.4 Manufacturing Process

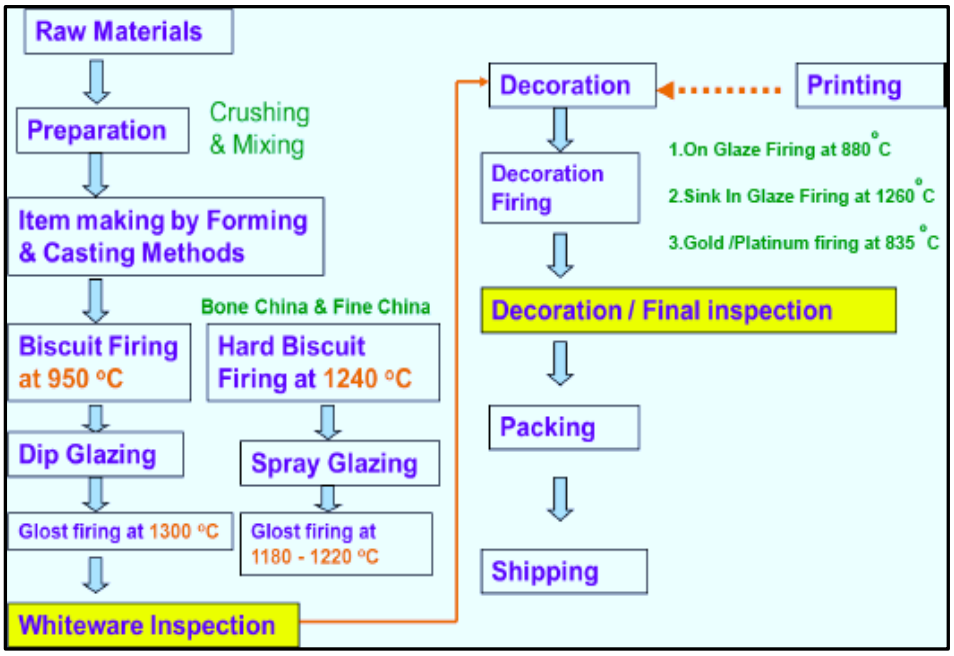

Figure 1.3 Flowchart of Manufacturing Process

1.3 SUMMARY OF THE WORK ENGAGED

The first few weeks of the training period were spent to get familiarized with the factory premises, the porcelain product manufacturing processes, the processes in different departments and how they contribute towards the overall production process, how machines work and the components inside of the machines etc. Furthermore, we were given the opportunity to engage in ongoing projects, and to undertake ongoing maintenance procedures with the supervision of the factory engineer. Most importantly we were able to learn about efficient Engineering managing and production methods through some lectures given by the Monozukuri team in the factory.

Chapter 2

MAINTENANCE DEPARTMENT

2.1 INTRODUCTION

The Maintenance Department is the place where, the Mechanical, Electrical and Production Engineering trainees are being appointed for their training and they are being trained under the head of the department, Factory Engineer, Mr. Nihal Hewage. The two main divisions of maintenance department are workshop and electrical division. This department is responsible for the maintenance and repair of mechanical and electrical equipment of the factory. Civil Engineering work is also being undertaken by the maintenance department, but they are somewhat rare compared to mechanical and electrical maintenance work done in each day. The crew at the department is adequate to get the day to day work done but if the demand is high or the skill set of the available workers are not up to the required work, outsourcing of work is done with the approval of the factory manager.

2.2 WORKSHOP

The workshop is headed by the foreman, Mr.Athula and the technical superintend, Mr.Pieris. Conducting meetings at 7.30 a.m. to assign the jobs to the technicians is a usual task done under the factory engineer. Maintenance requests are sent to the workshop through a responsible person of each deparment and work is allocated after the approval of the factory engineer. The foreman allocates the work under the supervision of the factory engineer. Workshop has various machines such as lathe machines and other useful items stored at the store room.

2.3 ELECTRICAL DIVISION

The electrical unit is headed by the electrical engineer. This unit is responsible for continuous electrical maintenance of the factory through repairing of electrical faults, maintenance of power distribution systems and electrical machines like motors. The department has four generators stand by to face any power cuts during any time of the day.

2.4 PREVENTIVE MAINTENANCE

As the name indicates, this type of maintenance is being done before break downs. This is what is done at Noritake Lanka Porcelain Limited as a usual thing, because it is believed to reduce cost greatly. To prevent faults from occurring, replacements of certain mechanical parts, cleaning of components, and tests are performed time to time within certain time periods. The main maintenance work is carried out during the mid-April vacation, which is call as ‘Vacation Maintenance’. Because workers get a vacation of two weeks for the New Year. ‘Vacation Maintenance’ plan for 2019 were prepared by us, the engineering trainees, under the supervision of the factory engineer and with the help of other department heads, the workshop foremen and the superintend. The plan is attached under the chapter, ‘Annex’. The following steps were done to update the Vacation Maintenance plan.

- Collecting data from the last year list, on jobs that has to be done.
- Contacting heads of the departments to collect data on this year.
- Contacting the relevant technician for each job.
- Combining the data with Electrical Engineering division.
- Planning suitable dates.

Every preventive maintenance is done after shutting down the relevant machinery for the sake of safety. As an example, the kilns were shut down 3 days prior for the maintenance, since they need time to cool down before checking replacing components inside of them. Safety tags were used as shown in figure 2.1 to indicate that the particular machine is shut down.

Figure 2.1 Kiln Closed Tag

2.5 BREAKDOWN MAINTENANCE

The workers working at certain machines at the factory has some amount of knowledge on repairing their devices in small break down situations. But, most of the times they need help from the maintenance department. Therefore, they are supposed to inform the head of the relevant department in order to send a 'Job Card' to the maintenance department. Once the maintenance department receives the Job Card, the factory engineer or the foreman decides on what actions has to be taken to fulfill the requirements.

2.6 EFFLUENT PLANT MALFUNCTION

The main function of the effluent plant in the factory is to clean the waste water, which has contaminated with clay particles and other chemicals used in the porcelain production process. The tank, which is used to mix the water after the chemicals are being added has an agitator to stir the mixture for efficient cleaning. A Job Card was sent to the maintenance department of informing that the agitator was not up to the standard speed.

The agitator is run by a motor and the energy is transferred through a pully arrangement. To increase the speed of the agitator, the pulley at the motor end has to be enlarged. First, the plant was temporarily shut down and pulley at the motor end was disassembled as shown in figure 2.2.

Figure 2.2 Disassembled Pulley

The pulley, which was chosen to replace the existed one was not compatible with the shaft of the motor. Because, the bore of the pulley was too large to fit perfectly with the motor shaft. Therefore, the bore was enlarged furthermore using lathe operation and welded with a bush at the bore as shown in figure 2.2. The bush was designed to fit perfectly with the motor shaft.

Furthermore, the new pulley had a three-groove configuration, whereas the old one was two grooved. If the three-groove one was replaced regardless of number of grooves, it might result in extra energy loss and vibration. Therefore, the extra part was separated using a lathe machine.

Figure 2.3 Pulley with the Attached Bush

2.7 LATHE MACHINES AT THE WORKSHOP

The lathe machines at the workshop had following special features in order to enhance safety and to create an ergonomically friendly environment.

- There were four lathe machines and they were placed parallelly to each other but angled with the walls of the building. Because of that, the hot metal chips coming out while operating will not contact with the technician, who is working in the front lathe machine.
- Lathe work is usually done while standing for several hours continuously. Therefore, there is a chance for the technician to faint while in the operation leading to catastrophic situations. This is being avoided by using wood pallets, which are designed to ensure a good blood circulation to the legs.

Metal moulds, which are used to get the shape of the porcelain products, are manufactured using lathe machines at the workshop. The mould templates that helps to create the metal moulds are received from Japan. Those templates can be used to use as a guide to the tool placement of the lathe machine.

For each lathe operation, the chuck is need to be checked for the balance. There are two main types of chucks.

- Three-jaw chuck – Adjusting nuts move simultaneously
- Four-jaw chuck – the screw threads are adjusted separately to tighten the drill bits.

The dial gauge shown in the figure 2.3 is used to check whether the work pieces are centered perfectly. It has a magnetic base so that it would contact with the lathe machine tightly ensuring zero unwanted movements while calibrating.

Figure 2.4 Lathe Machine Dial Gauge

Chapter 3

PREPARATION DEPARTMENT

3.1 INTRODUCTION

The production process begins at the preparation department. Raw materials such as Feldspar, Dolomite and Quartz are broken down and processed so that it could be further processed into desired products. The raw materials are transported usually by trucks from Galaha and several locations in Matale district and the preparation department is placed such that the raw materials can be conveyed easily from the trucks to the department. There are three unloading locations allocated separately for Feldspar lumps, Quartz, Dolomite and pebbles. Quartz is the main raw material, which is used

Figure 3.1 Crusher

Figure 3.2 Jaws of the Crusher

The first machine the raw materials meet, after unloading from the trucks is the crusher. See figure 3.1. There are three stages of crushing raw materials. First two stages use jaw crushers, which has metal plates designed as jaws, as per shown in figure 3.2 to crush the raw materials into smaller particles.

The final stage involves with a roller crusher and the outcome of the crushing process is particles which has the diameter in the range of 5 mm – 10 mm. Those particles are fed into the crusher separately according to the type of the raw material and before every time when a new raw material, which is different from the previous one is fed into the crusher, the crusher is cleaned to avoid contamination. The dust particles are collected at the bottom of the crusher as shown in the figure 3.3 and disposed.

Figure 3.3 Dust Particle Collector

The crushed raw materials are stored in a nearby location to transfer them to the ball mills for the grinding process.

When the regular checkup of the crusher is done it was found out that the jaws have worn out. Therefore, it had to be filled by welding. See figure 3.4.

Figure 3.4 Welded Jaw Crusher

3.2 BALL MILL

Figure 3.5 Ball Mill

There are 15 Ball Mills at the preparation department and 12 of them were at the working condition. A ball mill as shown in figure 3.5 consists of a hollow cylindrical shell rotating about its horizontal axis. It is partially filled with balls, which are made of steel (chrome steel), stainless steel, ceramic, or rubber. The function of the balls is to grind the raw materials. The inner surface of the cylindrical shell is usually lined with an abrasion- resistant material such as manganese steel or rubber. Less wear takes place in rubber lined mills. The length of the mill is approximately equal to its diameter. Huge particles of Quartz, Feldspar and Dolomite are broken down in this process.

As the shell of the ball mill rotates, the balls are lifted up on the rising side of the shell and then they are dropped down on to the feed from near the top of the shell. In doing so, the solid particles in between the balls and ground are reduced in size by impact. The normal size range of the raw materials is 5 mm to 10 mm of average diameter. They are reduced to an average diameter of 8 µm at the ball mill. There are three types of balls as S1, S2 and S3 and they are combined in ball mills such that it suits the objective of the grinding. Alumina balls are being lately considered as a substitution for pebbles to reduce the cost. In case of maintenance, an annual maintenance procedure is followed to replace the worn-out parts. The main part which wears out is the bearing and bearings for Ball Mills are in constant demand.

The materials are mixed with water in the ball mills and transferred to the tanks to store according to the type of the mixture and they are continuously stirred to keep mixed.

3.3 FILTER PRESS

Figure 3.6 Filter Press

Filter press is a device, which is used to take out water from the clay mixture. The mixtures, which are stored in the tanks after the milling process, are pumped and pressurized through the filter presses in order to get clay plates with a reduced water percentage.

We were assigned to address a problem with an engineering solution, as the newly installed filter press, which includes plastic plates instead of metal plates as in older models, produced larger clay plates. The specific problem was, the weight of the clay plates that has to be carried out by a worker has increased exposing them to an unsafe working environment.

Figure 3.7 Filter Press Plates

The solution, the engineering team came up with was facing off the plastic plates in order to decrease the thickness of the clay plates.As shown in Figure 3.7, the plastic plates were taken out from the filter press to take the current measurements of the thickness values and face them using a facing machine.

3.3.1 Annual Filter Press Pump Service

The annual membrane pump service was undertaken by the maintenance department of the factory and we were assigned to create the working standard report for the future use, to improve and secure the safety and the efficiency of the process. The working standard report is attached at the end of the report. The main tasks of the annual service of the filter press pump are as follows.

- Getting ready for the task by taking safety measures
- Checking the diaphragm pump for damages and repairing
- Changing of oil
- Cleaning of pipelines
- Cleaning of the ferro magnet

3.4 PUG MILL

As shown in figure 3.8, clay plates are transported from the filter presses and stored at the pug mill unit. They are fed into the pug mill and it can achieve a thoroughly mixed, homogeneous mixture as the output in a few seconds. It is come out in a cylindrical shaped rod. Therefore, it is convenient for the forming processes that are still to be done.

Figure 3.8 Pug Mill with Clay Plates

3.5 FERRO FILTERS

Ferro filters are mainly used at the inlets of the filter presses. See figure 3.9. Other than that, they are used to test clay mixtures for iron particles. It is simply a magnet, which is attached between the membrane pump and the filter press. This is an important part of the porcelain production, since the iron particles create cracks when the products are exposed to higher temperatures at kilns.

Figure 3.9 Ferro Filter

Chapter 4

FORMING DEPARTMENT

4.1 INTRODUCTION

The main function of the forming department is to shape the raw material mixture rods by the preparation department. In total there are 12 forming machines at the factory. Forming machines consist of mainly two steps.

1. Jiggering
2. Drying

4.2 JIGGERING

Jiggering is the process of mixing of raw material mixture and turning it on a wheel beneath a mould to a specified size and shape. Jiggering is an application of use of centrifugal forces in the industry. The roller head velocities and other parameters vary from product to product and are provided to machine operators. There are mainly two types of jiggering.

4.2.1 Outside jiggering

As the name implies, the outside surface of the mould is used to obtain the shape. A profile describing the outside shape of the ware is used to force the soft clay against a rotating plaster mould describing the inside shape. This is mainly used for flatware.

4.2.2 Inside jiggering

The inner surface of the mould is used to obtain the shape. A profile describing the outside shape of the ware is used to force the soft clay against a rotating plaster mould describing the inside shape as shown in figure 4.1. This is mainly used for hollow ware.

Figure 4.1 Inside Jiggering Machine

4.3 DRYER

After the jiggering process, the products are sent to long tunnel like structures as shown in figure 4.2 called dryers. A dryer consists of 120 trays with 4-5 items per tray. These trays slowly travel along the tunnel and items are dried in the process. These products are called green ware. After drying against the plaster, the clay shrinks and can be removed from the mould and the process is repeated.

Figure 4.2 Dryer

4.4 BONE CHINA DRYER PROBLEM

It was found that some of the products coming out from the bone china dryer are cracked. After investigations done by the Engineers, the problem was suspected to be the high humidity inside the dryer. Because, if the moisture inside the clay products could not be removed properly, it might lead to cracks in products. This happens due to saturation of water vapor inside the dryer. There are 6 dampers on the top of the dryer to acts as outlets for the water vapor.

In order to address the problem with a solution, the temperature and humidity data had to be taken from the inside of the dryer as shown in figure 4.3. But it was not a success due to following reasons.

- Lack of responsiveness of the RH meter shown in figure 4.4. Therefore, the time was not enough to get readings.
- Difficulty of getting readings due to unfavorable dryer layout. (Some of the dampers were not reachable)

Figure 4.3 Measuring Thermodynamic Properties Inside the Dryer

Figure 4.4 Taking Readings from the RH Meter

Chapter 5

DECORATION DEPARTMENT

5.1 INTRODUCTION

Decoration is the final process of a porcelain product prior to shipping. Decorating products is done in two steps. Initially they are stickered by the relevant decoration or hand drawn by skilled workers and then it is processed through a dryer to make the decoration permanent. This adds value to the product and if the decoration is handmade, the value is increases drastically. The decoration part is called the decal and it is designed and printed by the printing department. It is pasted onto the item and squeezed to get rid of air bubbles before the drying process.

5.2 DECORATION RENOVATION

5.2.1 Dust Problem

Decoration department is a place where there should not be any dust particles. Because, dust particles might stick between the printed stickers and the porcelain products. It will lower the quality of the products. Even though the decoration department is air conditioned, there are still ways of dust particles coming into the department. We were assigned to find out a solution for the dust particle problem and it was obvious that the main carriers of the dust particles are the carts that are entering the decoration department, with porcelain products, which are to be decorated.

5.2.2 Modification of the cart entrance

Cart entrance had to be modified such that the contact with the outside is minimum in the process of good transportation. Therefore, a new method was introduced to use separate carts to transport goods inside the decoration department. The new entrance is designed such that the goods, which are coming from the outside in outside carts will be transferred safely to the inside carts, minimizing the dust particle arrival to the decoration department. As shown in figure 5.1, the old cart pathway was not straight therefore, the workers had to give an extra effort to pull the carts towards the entrance. Figure 5.2 shows how the layout was changed, addressing the major issues. A conveyer was introduced to transfer goods from outside to the decoration department and it was designed such that all types of carts can be used to transport the products.

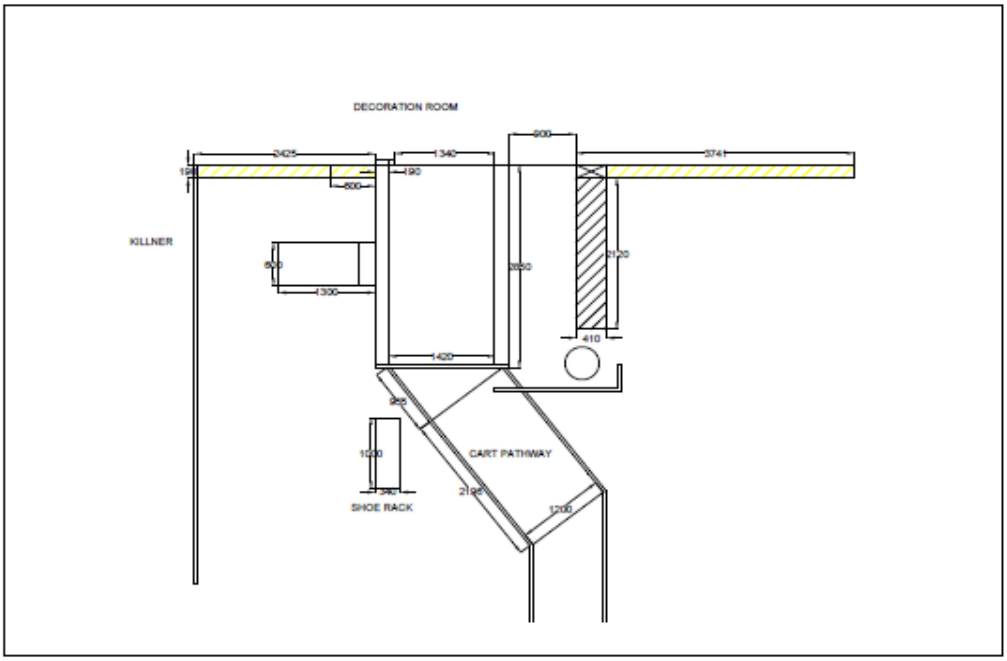

Figure 5.1 Old Entrance Layout

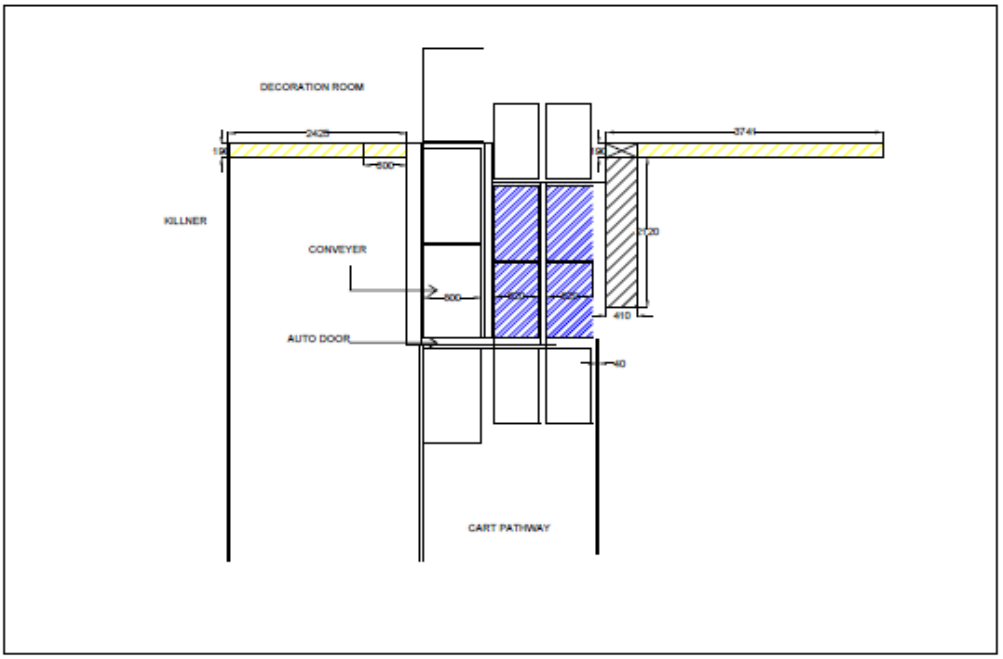

Figure 5.2 Designed Layout

5.2.3 Modification of the people in/out

The workers in the decoration department used the people in/out, which is separated from the cart entrance. But with renovation of the cart entrance this too had to be changed in the following way and two possible design concepts were pitched as shown in figure 5.3 and figure 5.4.

- Removing the existing air shower booth.
- Relocating the shoe rack.
- Removing the sink and relocating.
- Relocating lockers.
- Fabricating a new compartment for ‘Clean Room’.
- Ceiling fabrication.

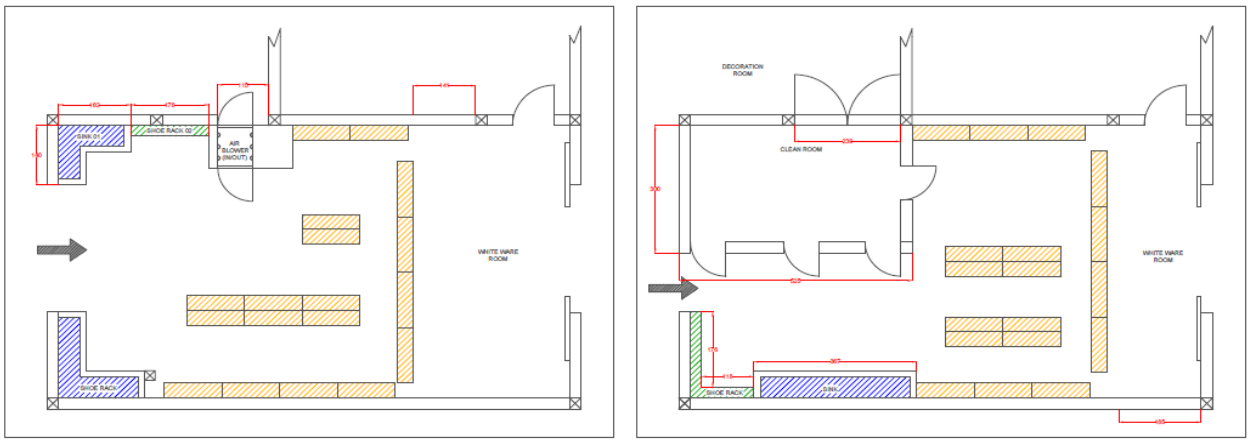

Figure 5.3 Comparison of the Present Layout with Proposal 01

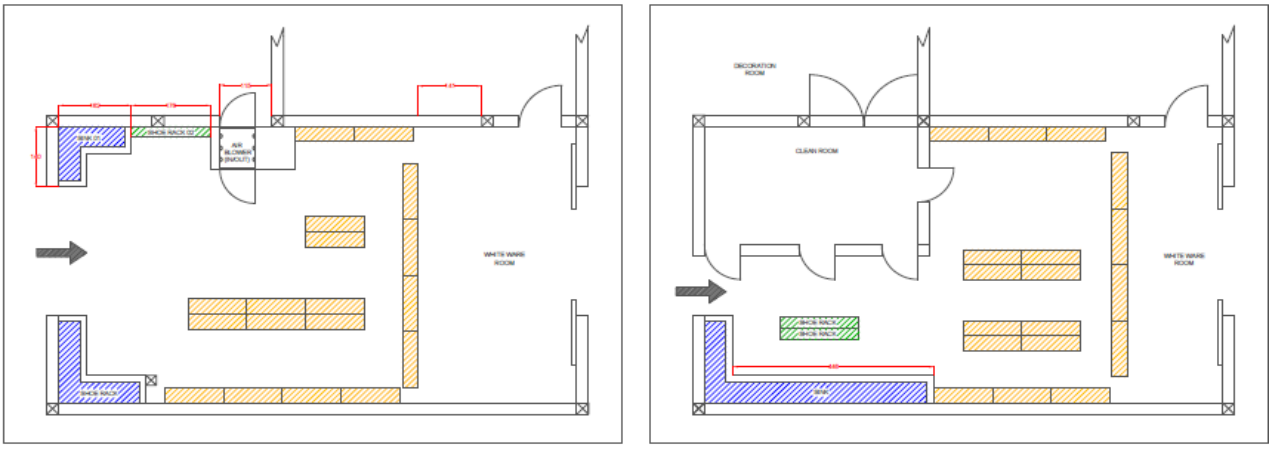

Figure 5.4 Comparison of the Present Layout with Proposal 02

5.2.4 Modification of the carts

The existing carts could be categorized in to two types as type A (See figure 5.5) and type B (See figure 5.6) according to their dimensions. They all were checked to identify their type and separated for modifications. For the transferring of goods to the decoration department, goods should first go through the conveyer at the entrance. Therefore, the goods need to be transferred using a plate from the cart to the conveyer. The plate is rolled on 'Corocone rollers', which are newly fixed to both type of carts. See figure 5.8.

Figure 5.5 Cart type A

Figure 5.6 Cart type B

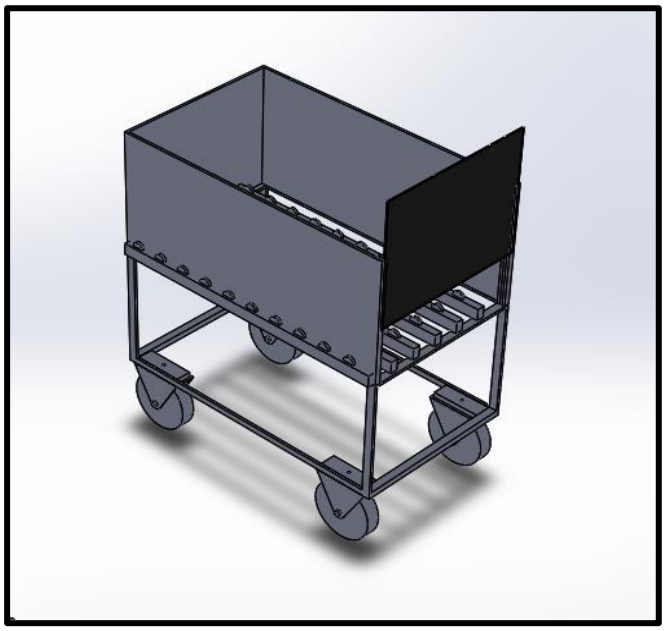

Figure 5.7 New Cart Design

The following steps are supposed to take in order to make the carts as shown in figure 5.7.

- Modifying Type A and Type B carts by fixing corocone rollers.
- Opening the front side of the carts and setting up a sliding door.
- Standardizing Type B carts by changing the height.

Figure 5.8 Corocone Rollers

Chapter 6

KILNS

6.1 INTRODUCTION

The Kiln is a one of the most important parts of the factory, since almost all porcelain products goes through a kiln one or more times in the process. The Kiln is only switched off during the month of April in each year for maintenance work, giving all the workers the April vacation except the workers at the Maintenance Department. Workers at the Maintenance department should be involved in vacation maintenance at the time. Kilns need to be fired 72 hours – 80 hours before operation and the same amount of time needs to be given for the Kiln to cool down as well.

There are three kinds of firing as hard biscuit, soft biscuit and gloss firing and they are categorized according to the temperature at which they are fired and the process step. Hard biscuit firing is done at 1250 ^{0}C and soft biscuit firing is done at 950 ^{0}C. gloss firing is done after glazing the products. There are two types of kilns in the factory according to the firing process.

- Oxidation firing – Fired under excess Oxygen. This is the most efficient firing process since it combusts the fuel with the help of Oxygen. Therefore, it produces a blue flame.
- Reduction firing – Fired under low Oxygen. The incomplete combustion will produce CO along with CO_2. Therefore, it will produce a yellow flame instead of a blue flame. CO has to be burnt afterwards with oxygen to reduce the pollution.

6.2 KILN OPERATION

Gross kilns at Noritake Lanka Porcelain Limited has a special mechanism to transfer carts in to the kilns and to take them out. The time period a cart should be inside the kiln is standard and it should be constant for all the carts. Carts are pushed to the kiln by a hydraulic piston as shown in figure 6.1.

Figure 6.1 Hydraulic Piston Moving Carts

The piston’s working range is equal to the cart length. At a time, the kiln has 46 carts inside of it this means the kiln’s length is equal to the 46 times of one cart’s length. A new cart is pushed to the kiln by the hydraulic piston in every 45 minutes. A kiln has three major zones as following.

- Pre-heating zone
- Firing zone
- Cooling zone

Chapter 7

SAFETY AND QUALITY

7.1 INTRODUCTION

This chapter contains a description of the quality control safety measures taken by Noritake. Since Noritake Lanka Porcelain Limited is a Japanese company, the safety measure taken are up to the international standards.

7.2 QUALITY ASSURANCES & STANDARDS

- ISO 9001:2008 certified since 2000, International standards that specifies requirements for a Quality Management System (QMS)
- ISO 14001:2004 , International standards that specifies requirements for an Environmental Management System (EMS)
- OHSAS 18001:2007, Occupational Health and Safety Assessment Series, is a British Standard for occupational health and safety management system.

7.3 KAIZEN

'Kaizen' the Japanese word when translated to English is Good change. The employees at Noritake are encouraged to improve processes by contributing ideas and suggestions and they are even awarded with money for the best contributions. Contributions from any of the employees are welcomed regardless of the department they represent.

7.4 SAFETY MEASURES

They define a situation called 'Abnormal Situation', which is not the same situation as usual but an emergency situation, which needs to be addressed by the authority. All the workers are advised to follow the simple three step method called, 'Stop Call Wait', where in an abnormal situation, you are supposed to stop the work immediately, call the authority and wait for the authority to get some action.

At the first day of the work, every worker is given a lecture on safety by the department of Human Resources, and then tested by giving an examination paper on safety. This ensures the knowledge on safety of each and every worker in the factory.

Whenever a maintenance work has to be done, the workers of the maintenance department uses safety gloves as shown in figure 7.1 and safety shoes as shown in figure 7.2.

Figure 7.1 Using of Safety Gloves

KY is a risk assessment method used in industrial working environments. Listing up the hazards and risks existing among job processes and environments, crucial risk information such as accident reports, near miss event reports and safety improvement are done in a KY assessment. It is important to overcome above obstacles for further application of this technique with enough validity. This method is widely used in the factory in maintenance activities and time to time KY assessments are done with the help of experts as an exercise to enhance the experience of the workers. Figure 7.3 shows how the KY sheet is stuck near the location, where the maintenance work is ongoing.

Figure 7.2 Using of Safety Shoes

The work area is covered with caution tapes and tags are used to indicate signs as shown in figure 7.3 and figure 7.4.

Figure 7.3 Using of Caution Strip

Figure 7.4 Tagging Warning Sign and KY Sheet

CONCLUSION

The first two weeks of our training period was spent on familiarizing the organization, and familiarizing the production process and as well as with the people. The Factory Engineer Mr. Nihal Hewage was very helpful in us getting used to the surroundings and introduced us to several projects, which are ongoing at the time. Most of the projects aimed for a solution for a critical problem at the factory that needs to be addressed by professionals.

The lessons learnt under the academic curriculum were pretty useful in some of the problems we encountered such as designing of the cart project and other micro designs using SolidWorks and AutoCAD. Even though the time frame was not adequate to finish all the projects that we were assigned, we were able to cover almost every main process at each department while completing one project with a proposal for a new cart entrance design for the decoration department.

The training period at Noritake was an enjoyable experience and many lessons were learnt on Engineering related matter and otherwise. Beside the academic curriculum a lot was on understanding human interactions at a factory workplace.