SITARAMBHAI NARANJI PATEL
INSTITUTE OF TECHNOLOGY AND RESEARCH CENTRE, UMRAKH

A Vidyabharti Trust Institution
Vidyabharti Campus, At. Ta. Bardoli, Dist. Surat-394345
Ph.02622-224581, 220581 Fax : 02622-227481,225458
Email : admin@snpitrc.ac.in, vbtdegree_umrakh@yahoo.co.in
Visit us on : www.snpitrc.ac.in

A Report on Industrial Visit at Nandratan Foundry & Engineering Works, Sarigam

15/12/2017

EXECUTIVE SUMMARY

Mechanical Engineering Department of S.N.P.I.T. & R.C., Umrakh arranged an industrial visit to Nandratan Foundry & Engineering Works Pvt. Ltd., Sarigam on 15th December 2017 with 17 students of 1st year M.E. Production Engineering. The purpose of the visit was to enhance industrial exposure of the students, get practical knowledge of manufacturing procedures and various casting techniques. Our three faculty coordinators Mr. Milan Patel, Mr. Misal Gandhi, Mr. Hiten Mistry and two lab assistant Mr. Ajay Patel, Mr. Jignesh Patel also took part in prestigious industrial visit.

AIM OF INDUSTRIAL VISIT

Industrial visit is considered as one of the tactical methods of teaching. The main reason behind this- was to allow student to know things practically through interaction, working methods and employment practices. Moreover, it gives exposure from academic point of view. They also provide students a good opportunity to gain full awareness about industrial practices. Through industrial visit students get awareness about new technologies. Technology development is a main factor, about which a students should have a good knowledge. Visiting different companies actually help students to build a good relationship with those companies. We know building relationship with companies always will always help to gain a good job in future. After visiting an industry students can gain a combined knowledge about both theory and practical. Students will be more concerned about earning a job after having an industrial visit.

ABOUT INDUSTRY

Nandratan Foundry manufactures ferrous and non-ferrous castings (as cast or with machining), 11% to 14% high manganese steel and spring steel wear products for the past 25 years. NARFEW also an ISO 9001: 2008 certified company with their plant based in Sarigam, Gujarat about 160 kms from Mumbai specializing in gravity die casting, sand casting and fabrication. Nandratan Foundry & Engineering Works Pvt Ltd or NARFEW, established in the year 1984 has seen many changes through the last couple of decades. Today NARFEW is well placed to deliver world-class quality products to their customers across the world. Total customer satisfaction plays a central role in their business policies and they intend to keep it that way. They truly believe that “It takes months to find a customer but seconds to lose one” they serve customers from a wide range of industries like railways, cement, mining, heavy machinery, lighting, shipping and automobile.

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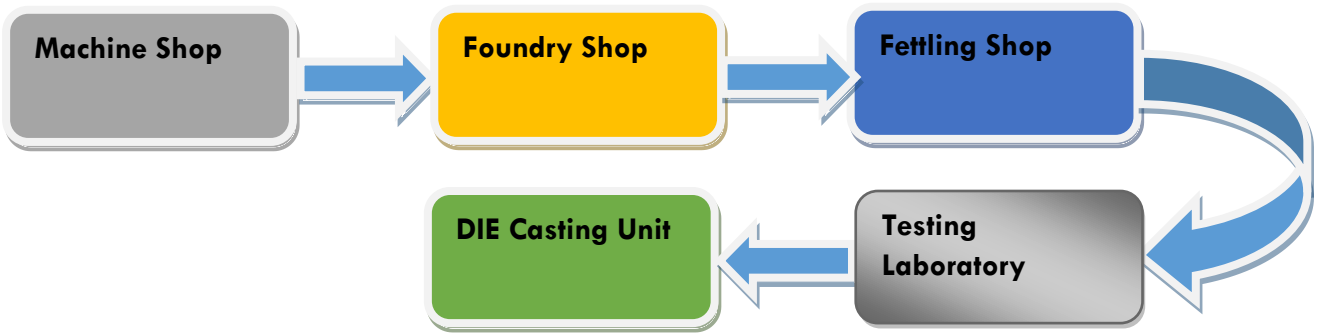
VISIT INSIGHTS

FLOW OF THE VISIT



As scheduled, the visit team reached Nandratan Foundry & Engineering Works Pvt. Ltd at 10.45 am. Warm welcome was received from company representatives and they gave us the brief idea about their work culture, vision & Mission and complimented us with notes and pen. Then Technology description by Engineering team was imparted to us.

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Below is the Technology learning from the industrial visit at NFREW which will impart roots of knowledge in our students of Masters of Engineering.

When the visit team reached at the location they found that there are two divisions of the NFREW. Both division makes the products based on casting process. At the first, our visit starts by introducing some of the basic process of casting and introduction on the staff of the foundry. They told us that they are making the products for Indian railways like wheel covers, engine parts, components of railway bogies etc.

Around 11:00 A.M. we started our visit in machining section. There were two sections in Unit-1. In this section 1, there was a CNC machine operating. They described us that they were machining the casting of wheel cover by using lathe operation.

Fig.-1 CNC machine Operation

Fig.-2 Split Pattern

During the operation they told us that they give the required data to the software or we can say that they input the codes for desired shape and mount the product on proper fixture. After compilation of the process the final desired product is taken out manually and take it to next step for more operations. After the introduction of CNC m/c we reached at small area where some of the patterns were available. They were split patterns available for casting small parts. They briefed us how this patterns are used. For more clarification they also provide us the final product of the suitable pattern.

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Fig.-3 Slotter M/c

Fig.-4 Horizontal Boring M/c

After the introduction of pattern we gathered at the machine shop where different types of machines were available. First they described us the Plotter and Vertical milling machine. They used machines like Shaper, Shear cutting m/c, Slotting m/c, Hot punching, Band cutting m/c, Band grinding for better accuracy and productivity. They described us all the machine operations and how they are used for manufacturing.

Fig.-5 Heat Treatment Process

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At section 1, we noticed that they manufacture products of CI, Aluminum, and Brazed aluminum. Then they took us to the big furnace which is used for heat treatment. Next to the furnace there was rolling m/c. In this Rolling m/c there were 4 rollers in which 2 were main rollers and 2 were auxiliary rollers. They showed us how plate is being rolled.

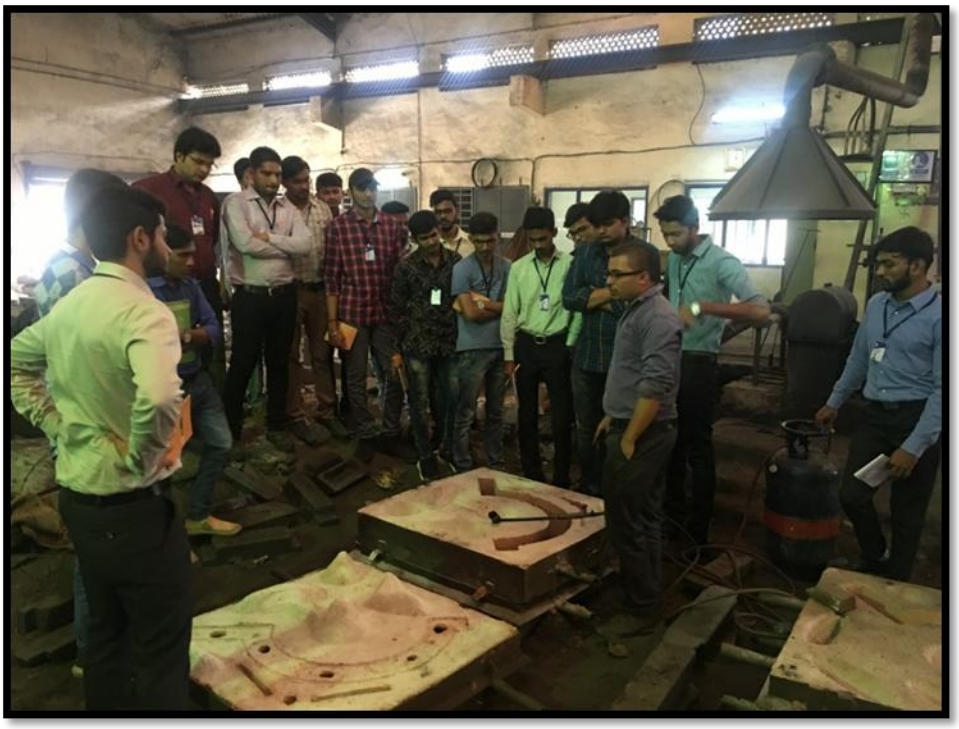

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Fig.-6 Casting Process

Fig.-7 Ramming Process

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Then we moved to the section 2 of the foundry 1. There were two types of casting being done. One was green sand casting and another was CO_2 sand casting. They used electrical induction furnace to melt the metal. They showed us how to remove impurities in the molten metal by adding different materials. After the description of the electric induction furnace we moved to the molding process. At the foundry they used cope and drag pattern for both casting. They introduced us about the casting materials for which the casting is being done. They showed us how to make risers and spur. Also explained practically why the locations of the riser and runner is so important. For ramming they had 2 machines. Then we moved to inspection room. At the inspection room the different types of inspection was being done. They had different types of testing machines. Name of the instruments are given below

1. Universal tensile machine.
2. Microscope.
3. Permeability testing machine.
4. Moisture testing machine.
5. Spectro meter.
6. Grain fine tester.

They described all the methods to operate the instruments. And some of them were shown practically by their inspector. Around 1:00 P.M. we completed the Unit-1 with satisfactory knowledge.

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Fig.-8 Die Pre-heating Process

At 1:05 P.M. we reached the Unit-2. The Product of Aluminum was being casted using the gravity die casting. There were 3 induction furnaces. When we reached one die was being pre-heated for the casting. They describe us in details how the gravity die casting is done. Around 2:00 P.M. we almost completed our visit with satisfactory knowledge.

APPRECIATION

The students got the opportunity to learn about different products and process which undergoes in manufacturing process. In addition, Machine learning was given by their officials at every corner of their plant. We S.N.P.I.T. & R.C. Mechanical Engineering department team are really thankful to the NFREW director Mr. Vaibhav Sheth and their team.

Report Prepared By,
Prof. Misal Gandhi
(Mechanical Eng. Dept.)