



Domestic Fieldwork

Visit To Nippon Steel & Sumitomo Metal Corporation IN Oita Prefecture AND Toyota Motor Kyushu Inc. IN Fukuoka Prefecture

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Outline:

From December 10th to 11th 2015, Green Asia students visited two Japanese major factories located in the northern area of Kyushu island, the Nippon Steel & Sumitomo Metal Corporation in Oita prefecture and Toyota Motor Kyushu Inc. in Fukuoka prefecture. The total number of the participants of the tour were 54, including 33 GA students, 4 GA professors.

The detail of the tour is as follows.



Date: December 10th-11th, 2015

Tour Schedule:

Dec. 10th	
8:55	Ito Campus (6 students only: Cong, Kojo, Tomy, Tanaka, Masaki and Fujisaki)
9:00-	<ul style="list-style-type: none"> Meet at Rotary between West Building No.2 and No.3 Depart from KU Ito Campus by bus to Chikushi Campus
9:50-	Chikushi Campus <ul style="list-style-type: none"> Meet at Entrance of Common Management Building
10:00-13:50	<ul style="list-style-type: none"> Depart from KU Chikushi Campus by bus. Eat lunch on the way to Nippon Steel & Sumitomo Metal Oita Factory. We will stop at a Beppu-wan Service Area. Unfortunately "Halal" dishes are not available. Please bring your own lunch if needed.
14:00	<ul style="list-style-type: none"> Video Presentation by company
14:30-15:30	<ul style="list-style-type: none"> Factory tour by company staff
15:30-16:00	<ul style="list-style-type: none"> Q&A session with managers
16:15-17:00	<ul style="list-style-type: none"> Depart from Nippon Steel & Sumitomo Metal Corporation Oita factory
17:00	Arrive and check into the Daiwa Roynet Hotel Oita in Oita city http://www.daiwaroynet.jp/english/oita/ (Please arrange dinner by yourself)
Dec. 11th	
9:30-13:00	<ul style="list-style-type: none"> Depart from the Hotel. Eat lunch on the way to Toyota Motor Kyushu in Fukuoka Prefecture. We will schedule a stop at a Koga Service Area. Again unfortunately "Halal" dishes are not available.
13:15-13:30	<ul style="list-style-type: none"> Video Presentation by company
13:30-14:30	<ul style="list-style-type: none"> Factory tour by company staff
14:30-15:00	<ul style="list-style-type: none"> Visit to the Toyota public relations museum
15:00-15:30	<ul style="list-style-type: none"> Q&A session with company managers
15:45-17:00	<ul style="list-style-type: none"> Depart from Toyota Motor Kyushu
17:00	<ul style="list-style-type: none"> Arrive at Ito Campus
18:00	<ul style="list-style-type: none"> Arrive at Chikushi Campus

Purpose of the Tour:

- Discover the products being manufactured and the various processes of production from two of Japan's biggest global corporations.
- Meet and discuss with factory engineers and managerial

- staff in order to understand the key operational activities of the corporation and its policies/strategies.
- Provide a novel opportunity for students to increase their knowledge of modern Japanese industries.
- Provide new students with an opportunity to become more intimately acquainted with their peers.
- Give some insight into the culture, history and working practices on the island of Kyushu.

The tour as a whole, including transportation, provided the students with the opportunity to display their leadership qualities, creativity, initiative, intellectual ability and communication skills in English.

During the tour students were asked to note the following points:

1. Students who participate in the tour will be divided into small groups. Each group will have a leader and a sub leader designated by the GA office before the tour. The leader and sub-leader should take responsibility for all the members of their team. (Please see the group list)
2. Each group will include at least one Japanese student who is required to interpret and facilitate communication with the company staff and the team.
3. Students who have a lap top computer should bring it on the tour for the convenient writing and editing of his or her report.



Assignments:

Students were asked to finish the following assignments:

Before the tour:

As a preparative assignment, each student is required to acquire some basic knowledge of the target company. At least 2 questions should be prepared for the company staff. The leader and sub leader of each group are required to collect the questions proposed by their members and select at least two of them for both factory Q&A sessions.

During the tour:

1. Each group is required to write two activity reports. One for each company. The report should be typed, 12pt Times New Roman on an A4 sheet in the PDF format. Pictures and tables can be included. (Please use your free time during the tour to write your reports)
2. The first report concerning Nippon Steel & Sumitomo Metal Corporation should be finished and submitted BEFORE ARRIVING AT THE SECOND FACTORY. The leaders are required to submit the reports to Dr. Takashi Watanabe via USB memory stick.
3. The leader and sub leader of each group are responsible for editing and submitting the two reports. The report should consist of several sections which deal with different topics respectively and at least one section should be assigned to another group member. (i.e. the report should not be entirely written by one person). Each section of the report must be more than 300 words long.

After the tour:

The second report concerning Toyota Motor Kyushu should be submitted to the GA office by email no later than 7 days after the conclusion of the excursion. The leader and sub leader of each group are responsible for editing and submitting the

Score	GP	Evaluation
90-100	4	A
80-89	3	A
70-79	2	B
60-69	1	C
0-59	0	D

reports. Please note we will use the “iThenticate” plagiarism software to check the reports. They must be written in your own words and not by using the “copy and paste” function from online sources.

Grading Scale:

Students were graded according to the following grading scale. This course employed the standard KU grading system;

GA office announced before the tour that a student would receive a D grade when a plagiarism percentage of >50% was determined by the iThenticate software.

Attendance:

During the tour, students were expected to meet the following criteria regarding the attendance of events scheduled.

1. Students must come to the scheduled events *on time* and prepared. Leaders and sub leaders are responsible for ensuring their team meets these criteria.
2. Unexpected absences from the events during the tour will incur a 1 grade reduction. Acceptable reasons for absence include legal obligations, death of a family member, university sponsored activities, and severe illness. Documentation will be required for excused absences.

Preparative Assignment:

Students were expected to have done all preparative work in advance. Students were also informed beforehand that failure to do so would adversely affect the students’ ability to perform during the tour.

Participation in factory tour and discussion:

We also informed students in advance that the participation portion of their grade would depend on their contribution to the discussion.

The following is one of tour reports about the visit to the Nippon Steel & Sumitomo Metal Corporation in Oita prefecture submitted by one of the student groups in the morning of the second day of the tour:

A Report on Industrial Visit To Nippon Steel & Sumitomo Metal Corporation (In Oita Prefecture)



NIPPON STEEL & SUMITOMO METAL

On 10th December 2015 By Students of Group 08

Masahito Tanaka, Sampad Ghosh,
Ni'mah Ayu Lestari, Shazia Hanif, Wang Zhengxing

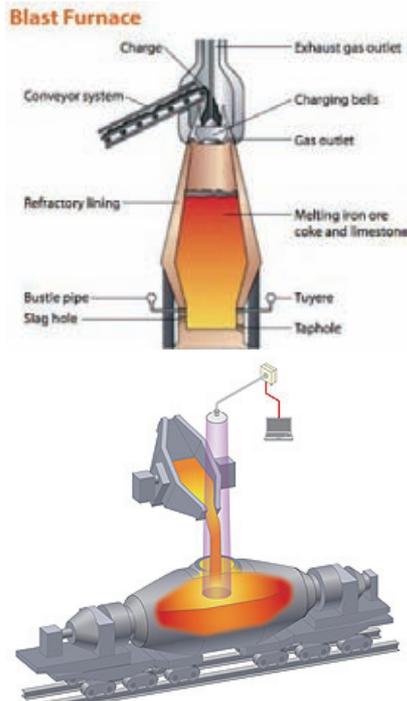
Kyushu University

Content:

1. Introduction: company profile
2. Production process
3. Variety of the products
4. Environmental aspect
5. Experience from the industrial visit
6. Conclusion



Both of the materials in steelmaking process are fed through the top hooper of blast furnace. The sintered iron ore may react chemically with coke under 2000°C to produce hot metal, slag and CO₂ as the by-product. From the bottom of blast furnace hot air also supplied to the process to accelerate the chemical reaction. As the main product of this step, hot molten metal would be transported to the next process by torpedo car.



c. Steelmaking

The steel produced by NSSC has 99% purity from 65% of its original raw material. Therefore steel production, the molten material need further purification process to remove the impurities as much as possible. The purpose of this step is to remove unnecessary carbon and impurities from molten iron before sending it to the next process, subsequently solidify of the molten steel. In the basic oxygen furnace, high pressure oxygen is introduced inside to allow oxidation of molten steel and change the final composition of the steel below 1.7% of carbon. The hardness level can be modified by changing the carbon content in the final product.

After purification step is finished, the molten steel is ready to be solidified into the slab/plate using mold which has varies dimension according to the weight of slab. The water is sprinkled over the mold to cool down the molten steel and help to solidify.

d. Rolling of steel product

According to the requirement, they may adjust the thickness and shape of the steel into slab 4.5-90 mm or hot-rolled coil 1.2-25.4 mm. All the product has different application such as plate is used for making ship and bridge, while hot-rolled coil used for making container

and vehicle body.

The entire process from raw material until getting the final product, it takes 24 hours.

3. Variety of the product

Basically the product can be classified into 3 types:

a. Hot coil

Based on its application as car body, some properties of hot coil should be achieved in order to keep the quality of the product, those are high strength, high durability, hole expansibility. The dimension of hot coil is 2150 mm width and the total production of hot coil is 45 ton. The use of coil for automobile is only 14%, 38% of total product send to be rerolled, 8% is going to the dealer. This product not only used to supply domestic demand, but also exported to the other country, at least 59% send to the Southeast Asia countries.

b. Plate

Plate can be applied for many purposes, for instance bulk carriers, marine structure, bridges, high rise buildings and construction machinery. Hence, some properties like high corrosion resistant, high ductility, high strength, high toughness, high tensile are required. The plate dimension is 63 m length and 5300 mm in maximum. Majority plate is used for ship building around 79% and for other purposes are for building materials, bridge framework, marine materials, industrial machine and etc. Only 18% of total plate product exported to the other country and it mostly used for domestic purposes.

c. Pipe and tube

Pipe and tube is produced from the sheet for following purposes: submarine line pipes, linear motor guide, clean pipe and piping for seawater desalination plant. There are 2 dimension for the pipe, medium and small diameter. Medium pipe has maximum diameter 610 mm (24 inches) made by high frequency resistance welding. While the small one made by heating the electric resistance welded medium pipe. Oita works also offer 1000 m long pipes in the coil. Mostly it is applied for oil well casing at around 30%. Approximately 56% of the pipe and tube product is exported to Southeast Asia Country.

4. Environmental aspect

The slogan of Oita Works is 001 refers to 0 accident, 0 pollution and 1st class steelworks. This means that Oita work concern about safety and environmental aspect. The following explanation will include energy saving and creating environmentally friendly working area.

a. Energy saving

Since the overall production process involve severe



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operating condition under 2000°C, there is an effective way to utilize the waste heat. To provide the energy requirement Oita plant build their own power generation facility. It is able to generate 800,000 kWh of electricity, 400 kWh is consumed for industrial operating process while the rest amount is sold to the Kyushu Power Plant.

b. Environmentally Friendly Working

b.1. Waste gas handling

Waste gas primarily generated from sintering process and it contains some hazardous gases such as NO_x, SO_x, and mineral dust. Before releasing it to the environment and preventing the environmental pollution, Oita works office use activated carbon to adsorb those harmful materials and install dust collector. For further prevention Oita work also spreading water on the road and cover their plant site with the net (840 m in length and 24 m in height).

b.2. Treatment of cooling water

As we know that quenching and cooling down are important process during casting of steel, huge amount of water is required. In order to reduce the water consumption, Oita work reuse 95% of the waste water for the next cycle. And obviously there is a treatment process before it reuse because the some dust contaminated the water.

b.3. afforestation

One step more toward conservation of the environment, Oita work create their indigenous forest as large as 50 m width and 5 km length with some benefits for instance adsorb the dust and insulate the noise. At least 100 type of species are grown in the forest and 800,000 plant exist there.

Along with the production process as in the form of environmental pollutant, Oita work always maintain and keep monitoring the environmental aspects.

5. Experience from the industrial visit

Definitely this type of industrial visit helps us to gain experience directly from the industrial environment and give a real opportunity to interact with business and economics. In this tour, we were guided by an expert from the factory throughout all the time. Interaction with an experienced person from the industry is really a matter of motivation.

We have known shortly about the activities of different production units. This company has lots of department and each department have many people from different culture. Moreover, this company has many sites in different countries of the world. They share their thoughts to coordinate various departments. This knowledge will helps us for coordination between different units and different culture.

We have visited several sections of different units. In each and every department, we got some new ideas of

thinking which was really very important for our personal development. They have described briefly the whole production process from collecting of the raw materials to the delivery. After completion of the industrial visit, we do believe that our knowledge about the practical field was upgraded at a very great level.

The company is always trying to use the latest new technology. Therefore, it is a chance for us to understand about the role of the advanced well equipped technology like machineries for production and manufacture of various items. For example, during visit of plate mill we learned that this produce the world largest steel plate in terms of width and length. The interesting thing is that we found no people inside the mill. All the process and machines are controlled by automatically. This means that there is less chance of accidental problem.

In terms of quality and safety, they do not make any compromise with quality and safety. They always try to maintain the purity level around 99% in their products and zero accident in safety aspects. During the whole visit, we are able to gather much information by knowing new things. Lastly this type of tour helps us to know how to translate the theoretical knowledge into practical.

6. Conclusion

Throughout the tour we got an excellent learning experience. It is noteworthy to mention that “See and know” is a better process than “read and learn”. The company has a vision to produce their products that without affecting the environment. They have tried to incorporate the modern facilities for making the industry more environmentally viable.

Finally we can say that during the entire industrial visit, the cooperation from the industry is found to be very much appreciable in terms of organization, administration and management aspects.

We are like to extend our heartiest thanks to Nippon Steel and Sumitomo Metal Corporation (NSSC) for making the today's date more meaningful. We feel honored to get an opportunity to visit such an esteemed organization.