

GA domestic factory tour
(Nippon Steel & Sumitomo Metal Corporation, Fujikura, Daikin)
Yuuichi ORIMOTO, GA assistant professor

A domestic factory tour visiting three Japanese global companies was held on March 17-20, 2015 as a part of an overseas short trip for GA industrial system subject. In this tour, we visited the nation's largest core industrial plants regarding iron manufacture, optical fiber, and air-conditioning apparatus fields in a single trip, and had an opportunity to hear various stories about research and development. Total 46 participants including 27 GA course students, 12 GA-RA students, and 7 academic staffs spent the fulfilling time, and it became the largest GA domestic tour in history on its scale.

On March 18, we visited the Kimitsu Works and Futtsu Research & Engineering (RE) Center of the *Nippon Steel & Sumitomo Metal Corporation* (NSSMC) in Chiba Prefecture. The Kimitsu Works is about 15 minutes bus ride away from the JR Kimitsu station. After getting the instruction of the Works, a factory tour starts by making 2 groups using a bus to watch inside the Works. It was surprising that the fact that private transportation and transmigration system well developed inside the Works. For example, the cars have the specific number plate for the Work's private use. Moreover, private trains run inside the field; of course, there are private railway trucks and railroad crossing. We first visited the No.4 blast furnace. The aspects of the blast furnace from the viewpoint called "Otachi-dai" (space with a distinguished history) have tremendous impacts. Next, we headed for the hot-rolling area. We could see here a very powerful aspects that thick and huge red-hot steel plate was rolled out to more thin plate with a thundering noise and strong heat. Then, we transferred to the Futtsu RE center located about 20 minutes bus ride away from the Works. After getting the center's instruction, we visited several research points in the center. For example, the use of by-product generated in the iron manufacturing process was researched for solving sea desert phenomenon. As the other example, the research for examining detailed composition of the materials at an atomic level to understand the strength of ironware from the microscopic viewpoint. Finally, we performed a Q&A session with 40 minutes and heard valuable stories on the care and idea regarding research and development.

On March 19, we visited the Sakura Plant of *Fujikura* well known as a company manufacturing optical fiber, conducting wire, etc.; the plant is about 10 minutes bus ride away from the JR Sakura station in Chiba Prefecture. After getting the instruction of the plant, a factory tour starts by making 4 groups using the bus in the plant. At first, we visited the fiber spinning plant of optical fiber. In the spinning plant, a thick base material for optical fiber is stringed out from the top of the 6th floor high of the building and stretched to an ultrafine wire when it reaches to the 1st floor. Inner structure of the base material consisting of several layers is retained as it is during the process. We also saw micro-size devices for maintaining optical fibers such as a fusion splice. Many working processes for the maintenance requiring a lot of experiences at one time were automated in these devices, and which lead to a reduced burden of daily work and the retain of working quality. At several points, we got the instruction from the company using VTR and samples. Finally, a Q&A session with around 30 minutes was held and it became a meaningful opportunity for the exchange of opinions.

In the morning of March 20, we visited the Miyako ecology center in Kyoto Prefecture. In the center, we can directly touch many displays regarding ecological wisdom and proposal for environmental problems. Furthermore, the building in itself includes many ingenuities saving energy and resources. We could feel many ideas on ecological point of view from the visit.

In the afternoon of March 20, we transferred to Shiga Prefecture and visited the Shiga factory of *Daikin* about 30 minutes bus ride away from the JR Kusatsu station. After getting the instruction from the company, a factory tour starts by making 2 groups. In the factory, we saw many automated guided vehicles running and working. And, it was surprising that there were various automatons using gravity force, inertial force, etc. to the maximum. Furthermore,

various measures with “Kaizen” spirit improve well a working environment in Daikin. After that, we got the instruction of “Production of DAIKIN system (PDS)”. In the system, the species and amount of the products are timely changed to the consumer’s needs. The same products are not provided on the same line so that we can reduce the stock as much as possible. Finally, we make a Q&A session with around 50 minutes. In the session, the student who visited the Daikin Industries Thailand made a question about the difference between domestic and overseas bases, and it lead to the impressive discussion.

The domestic factory tour using continuous three days was a valuable activity not only for the GA students but also staffs for visiting the nation’s largest industrial plants at once. We are extremely grateful to the three companies for kindly welcoming us regardless of its busy schedule.