

1 JCCU Tour report – The Netherlands 2010

This report gives a brief overview to the Industrial Visit trip taken by a group of 21 students to the Netherlands, organised by 2nd year students Anna Turskaya (Mansfield) and Georgina Royle (Trinity)



1.1 Schedule

The tour dates were from the 14th to the 21st of March 2010. We flew from Heathrow to Amsterdam to stay there for 4 days and then relocated to the Hague for the last 3 days. From there, most of the group returned back to London by Eurostar via Brussels where they were expected to make their own way home. Most of the European students stayed behind in Holland to make their own journey to their homelands. As for the industrial part of the tour, we've spent two and a half days visiting three companies, Corus, Shell and SKF.



A concise version of our itinerary looked like the following:

Dates	Itinerary
14/03/2010 Sunday	11:05 BD 105 flight from London Heathrow to Amsterdam Schiphol 13:25 Arriving to A'dam Taking a train/tram to arrive to the StayOkay Vondelpark Hostel Take a tour around A'dam – dinner at the hostel – evening tour around A'dam
15/03/2010 Monday	CORUS 8:30 Leaving the hostel 10:00 Visit around Corus 18:00 Return to A'dam – Dinner at the hostel – free time
16/03/2010 Tuesday	Visiting SKF 8:30 Leaving the hostel 10.00 Tour around Utrecht 18:00 return to Amsterdam Dinner at the hostel
17/03/2010 Wednesday	Free time in A'dam
18/03/2010 Thursday	10:00 departure for Keukenhof 16:00 Departure for Den Haag Tour around the Hague Dinner at the Hague, staying at StayOkay Den Haag
19/03/2010 Friday	11:15 Meeting at Den Haag HS 12:10 Bus at Schiedam to Refinery 12:30 Tour around the company 20:30 Tour Dinner at Delft
20/03/2010 Saturday	Free time in the Hague StayOkay Hostel Den Haag

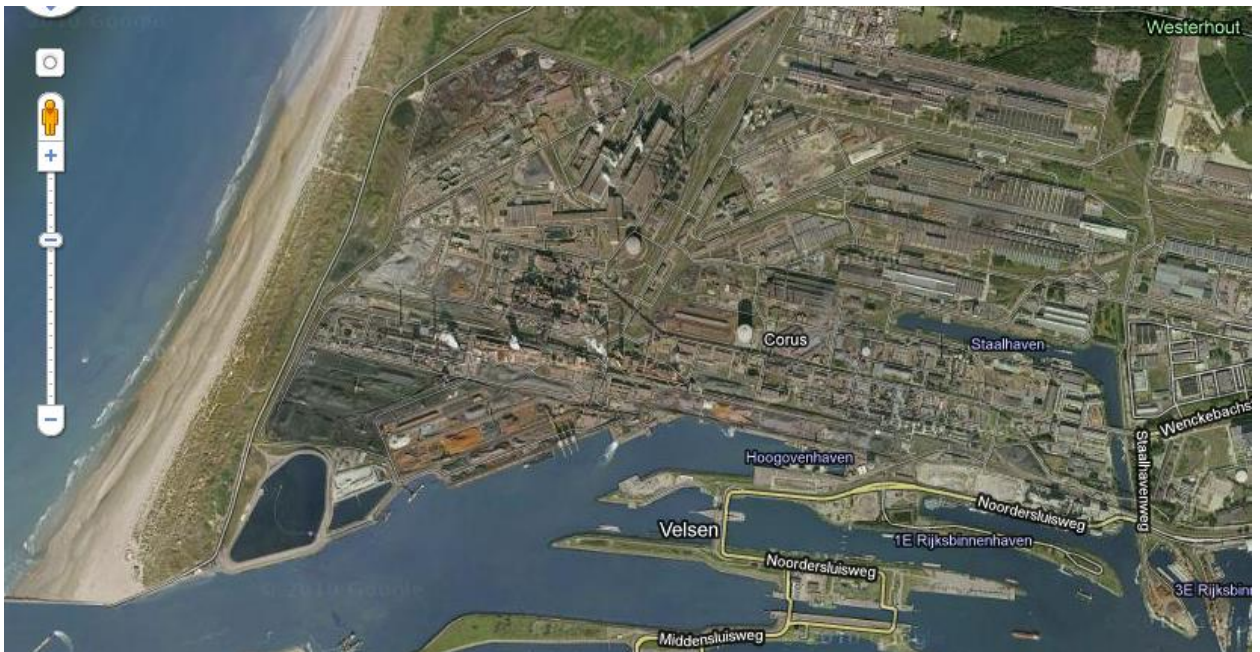
Dates	Itinerary
21/03/2010 Sunday	11:00 Departure from Den Haag HS to Brussels 14:59 Eurostar departure from Brussels 15:56 Arriving to LDN St Pancras – Students are expected to arrange their own transport from London-SP

1.2 Overview of the visits

For the industrial component of the tour, we have visited three companies, *Corus* at IJmuiden, *SKF R&D* in Nieuwegein and *Shell Refinery* near Rotterdam. What's important is that within just the few days, the visits would showed three various and essential approaches to the materials science industry: from the management of a corporation, such as *Shell*, to the research and development of new products at *SKF* to the actual production of steel at *Corus*.

1.3 Companies visited

1.3.1 CORUS



The first visit was to the Corus steel-making plant, located in IJmuiden, just half-an-hour ride from Amsterdam, with its own port that served like a private gate to the world. The main produce of Corus, IJmuiden is high quality battery steel, a market where their engineering excellence keeps them ahead of the emerging eastern industries.

Nearly every day a bulk carrier containing 160,000T of coal arrives by sea from Brazil, Australia and the rest of the world. Each year the plant uses 10 million tons of iron ore and 4.7 million tons of coal to produce 7.4million tons of steel. The waste products are reused: slag is sold to the cement industry; 8 million tons of CO is sold for electricity generation; and CO₂ is sold to farmers and pumped into nearby greenhouses. This is a corporation with 9000 employees, who

all work in shifts towards producing steel. An average time for the product to be made in is around six weeks.

To get our heads around the numbers, our receiving party - led by Dr Rene Duursma, and our guide Theo van Boom gave us an introduction to the plant. A particularly thought-provoking discussion of the future of the global markets was led by Professor Dr Rob Boom, after a lecture on 'Why Steel today'. Against the merits of Titanium and Aluminium, it is the steel that would have still have the dominating properties and will continue dominating the market in the future.

We were later shown around the plant afterwards, covering the whole process of the steel making. Starting from the piles of ores that had just arrived from across the world in the port, to the Blast Furnaces and the rolling machines. The latter were particularly impressive, as even when we were standing at distance of at least 30m from the conveyer belt, the radiated heat from the slabs was practically unbearable, even when the temperature of the slabs dropped to about 700°C.



To suit a variety of customers with various types of steel, Corus has a painting and galvanizing unit, as well as cold rolling; there has also been rising demand for zinc hot dipping.

The visit was a large success for the direct explosion to the metallurgy and the understanding of the scale of such an industry.

1.3.2 SKF

On the second day we've taken a trip to SKF, based near a major city of Utrecht. SKF, an international corporation of the Swedish origin is a leading producer of bearings, as well as seals, lubrication, mechatronics and maintenance products and power transmission products. Currently, SKF is the largest supplier of bearing products worldwide. Curiously, the well-known car manufacturer, Volvo, was originally a subsidiary company of SKF, which gives a grasp of how large this company is.



The receiving party, led by Hans Sloof, who along with Dr Alejandro Sanz, introduced us to the company's history, present and future. The scientific background was given by Erik Vegter, one of the head researchers at the site. The lecture perfectly complemented the recent courses my recent course on general fatigue giving real world examples and application to an otherwise theoretical concept for me.

After 'a truly outstanding lunch', where we had a chance to talk to the workers of SKF we were given a tour around the facilities. At first, we went to a production area where various parts could be fabricated, then we moved in to the laboratories. A number of scientists explained to us the various research which they undertook. For example, one demonstrated to us the testing machines he used in order to investigate the friction between different components when different lubricants are used. Another discussed the introduction of ceramics in the making of the balls for bearings, which allow for similar mechanical properties whilst being much lighter than the commonly used steel. Further to this, two different modelling systems were briefly explained to us. These allowed various parameters to be calculated accurately without having to create test pieces, which obviously provided great benefits to the researchers. BEAST was a product of SKF, used solely by SKF.

Overall, this visit a brilliant opportunity into a life of a scientist working for the industry, at the forefront of a company. SKF was immediately liked by a quite a few members of the group and showed that in global corporation indeed only two languages were spoken: English, and Mathematics.

1.3.3 SHELL

The final visit was to the Shell refinery near Rotterdam. We were met by Jim Young, the Reliability and Engineering Assurance Manager for the site, and Tamara Lim, a graduate of the Oxford Materials Department working in integrity management. After a short introduction to Shell, both the worldwide company and the refinery at Pernis, we were given a driving tour of the site; the scale of operations being incredible. The 550 hectare site produces over 400,000 barrels of oil each day and has enough piping to go round the world 4 times! Clearly, maintenance and integrity management of such a site is a colossal challenge.



During the tour we visited the port, where materials from the upstream shell operations come in by sea. We followed the material round the plant to the fractional distillation tower where the different types of oil are taken off, and then to the pride of the Pernis refinery, the 4 Crackers which take long chain oils and crack them to shorter chain, more useful oils. The Pernis site has 4 different types of cracker – Catalytic, Thermal, Hydro and HiCon. The HiCon cracker is the only one of its type in the world, and Pernis hope to use it in their goal of becoming the flagship refinery for the Shell group.

In the afternoon we had presentations from Shell Graduates working in 5 different sectors within shell to give us a broad taste of what a Shell career could entail. Some students found it particularly useful to have a presentation by Tamara showing just what sort of career a materials scientist could expect in Shell. The others found it beneficial to see how broad of employment spectrum is.

This presentation was backed up by one from Human Resources, giving us opportunity to ask questions about Shell's graduate scheme before the real highlight of the day, and audience with the General Manager of the Refinery - Hans van Scherpenzeel, the overall refinery manager, who talked about his background and career in Shell, and answered questions about the future of Oil production and what challenges faced Shell in the upcoming years.

1.4 Free time

The free time has been spent exploring Amsterdam, the Hague and one day has been spent in Keukenhof – a tulip park. We've travelled around the central part of Holland for a bit, which has given an impression about the country's liberalism, attitude towards life and of course rather flat landscape with occasional windmills.



1.5 Feedback of students

‘In summary, we visited 3, very different, giants of industry and came away with an insight into the operation of each and exactly how a materials scientist could fit into their operations. From what I’ve seen, the Dutch justly pride themselves on engineering excellence. They also have a keen interest in involving young and international students, as demonstrated by the highest level managers who came to greet us at each and every visit.’

1.6 Costs

The overall price for the tickets per person was 211 euros for transport, 250 euros for accommodation, 60 for group activities. 216 euros has been secured in sponsorship.

1.7 Thanks

Many thanks for the generous sponsorship of Armourers&Brasiers, IronMongers, the department of Materials, Oxford and Shell for the visit.

A special thank you goes to Dr Adrian Taylor for supervising us in the organisation of the tour. Mr David Lloyd for consultations. Our gratitude goes towards Dr Rene Duursma and Mr Rob Boom, Mr Hans Sloof and Ms Tamara Lim for fantastic hospitality!

And many thanks to David Lloyd, Chris Hutton, Christopher Box, Katie Plummer, Michelle Lim for helping us to write this report.

Anna Turskaya